

# ENVIRONMENTAL LAW OF WAR

Laurent R. Hourcle\*

## INTRODUCTION

This Article was initially prepared as a presentation to frame the discussion of the Environmental Law of War, the topic of a Vermont Law School Symposium in October 2000. This Article addresses three areas:

First, it provides an overview of the development of the Law of War and its application to protection of the environment from ancient to modern times. While formal discussion of the environmental aspects of war has been a fairly modern phenomenon, the environment as a tool of war has been a fact since ancient times. So too have there been longstanding proscriptions, mainly in religious teachings and literature, cautioning against the use of God's creation in mankind's disputes.

Second, it reviews current principles of the Law of War that may be useful in curbing environmental damage. Although this has been an area of scholarly debate for decades, whether and how that might work is still unclear. The simple fact is that while there has been discussion of environmental degradation caused by war and armies since the start of modern environmentalism in the 1960s, coincidentally the time of the Vietnam War, the international legal community and individual nations have done little about it.

Third, this Article examines the nature of current armed conflicts, as distinguished from those that were contemplated in creation of the Law of War. Historically, the Laws of War have their roots in bringing some sense of civility and humanity to larger scale armed conflicts, for the most part international rather than intra-national conflicts. Since the end of the Cold War, the focus has not been on World War III, but on bringing stability and the rule of law to local and regional conflicts. Because of this evolution in the nature of armed conflicts, issues arise as to whether the legal principles in the current Law of War—particularly as they may provide environmental protection—are still adequate in the face of smaller, but often more protracted and no less vicious national conflicts.

Finally, from this third area of discussion, there arises the question of whether the use of traditional military forces, particularly those of the former

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\* Professor of Environmental Law, The George Washington University Law School. He is a retired Air Force Colonel and formerly was head of the Air Force's Environmental Law Division (1986-1989) and environmental counsel for the Department of Defense from 1989 until 1992. He offers special thanks to June Wortman for her assistance in this presentation and Article, which first and foremost involved ensuring that the moral and humanitarian aspects of war were not forgotten.

superpowers and Western nations, is the best alternative for securing a rule of law within—as opposed to between—nations.

## I. WAR AND THE ENVIRONMENT

Conflicts among humans are no stranger to history, and neither are conflicts where one side attempts to employ the environment as a weapon of war. The conduct of war has always been inseparable from the use of the environment. One easily imagines that before recorded history humans used land features for cover and concealment and used the products of the land—stone, wood, fire, and even animals for military advantage. Such primitive environmental uses, though real, raise few concerns in a discussion of environmental degradation by war. At some point however, particularly where aided by capabilities of industrial technology, concerns do arise. Widespread herbicidal deforestation to deny concealment in Vietnam and setting fire to oil fields in Iraq are two oft-cited modern examples.

The concept of proportion is a distinguishing factor in whether use of, or damage to, the environment in war violates societal or legal norms. This concept of proportionality is well integrated into current Law of War principles. A second concept that raises concern is “environmental insidiousness.” This is used as a catchall phrase that includes unorthodox or unnatural manipulation of the environment as well as methods that may cause less obvious, yet nonetheless significant long-term or widespread environmental damage.

The following examples are culled from the annals of history to frame the discussion of war and the environment today:

- In ancient India, circa 4000 B.C., it is reported that combatants polluted the air by causing fumes that caused slumber and yawning;<sup>1</sup>
- During the Peloponnesian War, the Spartans saturated wood with pitch and sulfur and placed it afire under the walls of its enemy to cause toxic fumes;<sup>2</sup>
- In 146 B.C., during the Third Punic War, the soil of Carthage was laced with salt to pollute the land and render it infertile;<sup>3</sup>

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1. Jeffrey G. Hale, *The Evolvement of the Chemical Weapons Convention and Applicability of its Verification Framework to Other Arms Control Agreements* 25 (1999) (unpublished LL.M. Thesis) (on file at the Jacob Burns Law Library, The George Washington University) (citing SEYMOUR M. HERSH, *CHEMICAL AND BIOLOGICAL WARFARE; AMERICA'S HIDDEN ARSENAL* 3 (1968).

2. *Id.* (citing [www.opcw.org](http://www.opcw.org)).

3. Frank R. Finch, *This Land is Our Land: The Environmental Threat of Military Operations*, in *PROTECTION OF THE ENVIRONMENT DURING ARMED CONFLICT* 100 (Grunawalt et al. eds., 1996) [hereinafter *PROTECTION OF THE ENVIRONMENT*].

- To pollute an opponent's water, the Romans threw dead animals into the wells of their enemies;<sup>4</sup>
- The Mongolian incursions into Mesopotamia from 1213 to 1224 A.D. involved massive annihilation of all crops and livestock that was not appropriated by the invading Mongols. Genghis Kahn went to the point of deliberately destroying the major irrigation works of the Tigris River upon which the agriculture of the indigenous population of Mesopotamia depended;<sup>5</sup>
- In what appears to be the earliest report of knowingly engaging in widespread biological warfare, the Tartars in 1346 catapulted plague infested bodies into the city of Kaffa. As a precursor to current fears of the horror of biological warfare, sometimes referred to as the "poor man's atom bomb," this attack may have touched off the great plague epidemic of 1347 to 1351;<sup>6</sup>
- In the seventeenth and eighteenth centuries, environmental modification became a defensive tactic. During the Franco-Dutch War of 1672 to 1678, dikes and dams in the Netherlands were cut and broken by the Dutch in order to create large scale flooding and impede the advance of French forces;<sup>7</sup>
- In 1763, the British during the French and Indian Wars gave blankets infected with small pox to Indians they suspected of being sympathetic to the French;<sup>8</sup>
- During the Napoleonic Wars of 1796 to 1815, while the French advanced through Russia in the summer of 1812, the Russians practiced a self-inflicted scorched earth policy to impede Napoleon's progress;<sup>9</sup>
- The United States has its own shameful history of environmental warfare. In the U.S.-Navaho Wars of 1860 to 1864, the United States deliberately destroyed sheep and other livestock, as well as fruit orchards

4. Hale, *supra* note 1, at 26 (citing CHARLES PILLER & KEITH R. YAMAMOTO, *GENEWARS, MILITARY CONTROL OVER THE NEW GENETIC TECHNOLOGIES* 29 (1988)). Hale notes that Confederate soldiers during the Civil War also shot horses and farm animals in ponds to contaminate potential Union water sources. *Id.* at 26 (citing ERNEST T. TAKAFUJI, *BIOLOGICAL WEAPONS AND MODERN WARFARE* (1991)).

5. Marc A. Ross, *Environmental Warfare and The Persian Gulf War: Possible Remedies to Combat Intentional Destruction of the Environment*, 10 DICK. J. INT'L LAW 515, 517 (1992).

6. Hale, *supra* note 1, at 27 (citing ROBERT HARRIS & JEREMY PAXMAN, *A HIGHER FORM OF KILLING* 74 (1982)).

7. Carlson M. LeGrand, *Framing the Issues*, in *PROTECTION OF THE ENVIRONMENT*, *supra* note 3, at 25.

8. Hale, *supra* note 1, at 27.

9. Ross, *supra* note 5, at 517.

and other crops of the Navaho, as part of its successful strategy of subjugation;<sup>10</sup>

- During the Civil War (in actions that certainly belie the name), the Union army practiced a scorched earth policy in an attempt to starve the rebellious Confederate states. A special vehemence was shown in Virginia, where the agriculturally rich, 700,000 hectare Shenandoah Valley was systematically devastated between September and October 1864;<sup>11</sup>
- In Georgia, the state which served as the Confederate granary, four million hectares were laid to waste;<sup>12</sup>
- The twentieth century brought World War I and the use of chemical weapons. Evidence of those actions still remain in the pockets of gas-tainted soils around Verdun and other areas of World War I's infamous trench warfare;<sup>13</sup>
- In 1938, during the Second Sino-Japanese War, the Chinese dynamited the Huayuankow dike of the Yellow River in an effort to stop the advance of the Japanese. The ensuing flood waters ravaged major portions of the Honan, Anhwei, and Kiangsu provinces, destroying cities, crops, and topsoil of several million hectares, drowning hundreds of thousands people and leaving millions homeless;<sup>14</sup>
- Destruction of dams was a common tactic in World War II. The British demolished two major dams in the Ruhr Valley, destroying or damaging 125 factories, twenty-five bridges, and power stations, flooding coal mines, disrupting railway lines, and killing 1294 Germans;<sup>15</sup>
- The intensive day-night allied aerial bombing campaign left countless numbers of unexploded ordnance throughout Europe that still present problems today;<sup>16</sup>

10. *Id.*

11. *Id.*

12. Finch, *supra* note 3, at 100.

13. Closer to home, the consequences of chemical warfare linger today in the affluent Washington D.C. neighborhood of Spring Valley. This area is now known to be the previously forgotten site of a U.S. Army chemical warfare development activity. See Harry Jaffe, *Ground Zero*, WASHINGTONIAN MAG., Dec. 1, 2000, available at 2000 WL 11363641. Development and production of chemical weapons has almost been synonymous with environmental damage. Perhaps the largest, most complex and expensive environmental cleanup underway by the Department of Defense in the United States is the Rocky Mountain Arsenal just outside Denver, Colorado. Also, the Army chemical site at Aberdeen, Maryland became a cess pool of ineptly stored hazardous chemicals that eventually led to the conviction of three Army civilian personnel for environmental crimes. U.S. v. Dee, 912 F.2d 741 (4th Cir. 1990).

14. Aaron Schwabach, *Environmental Damage Resulting from the NATO Military Action Against Yugoslavia*, 25 COLUM. J. ENVTL. L. 117, 134 (2000); LeGrand, *supra* note 7, at 25.

15. Le Grand, *supra* note 7, at 25.

16. *Unexploded World War II Bomb found on German Building Site*, AGENCE-FRANCE PRESSE, Apr. 4, 2000.

- Allied experiments during World War II left Scotland's Gruinard Island channel contaminated with anthrax and uninhabitable even today;<sup>17</sup>
- Massive allied aerial firebombing in Europe and the Far East indiscriminately laid waste to cities and the environment, polluting land, water, and air just as assuredly as nuclear weapons;<sup>18</sup>
- The end of World War II brought the unleashing of what some call the greatest example of man's contempt for the environment with the use of atomic weapons in Nagasaki and Hiroshima.<sup>19</sup> The destruction wrought by these weapons was so horrible that at the time people believed it would be the end of all wars. Unfortunately, rather than end man's degradation of the environment through the weapons of war, the end of World War II brought the Cold War. Whether the reason behind the Cold War's scientific race was military supremacy or parity among the superpowers is debatable. What is not debatable is the record of environmental harm from above-ground nuclear tests to the testing and production of chemical weapons and the development of offensive and defensive biological weaponry;<sup>20</sup>
- The modern age of U.S. environmental law commencing in the 1960s and 1970s was also the period of the Vietnam conflict. During this war, the United States utilized a strategy that included massive rural bombing, chemical and mechanical deforestation, large-scale crop destruction, and intentional disruption of natural and human ecologies;<sup>21</sup>
- The 1980s and 1990s brought the end of the Soviet Union as a superpower, but did not end wars or environmental destruction from armed conflict. There were no longer two superpowers with similarly accepted ground rules of international conduct. Former surrogate states no longer needed to heed the bidding of their superpower master, which could often be restrained by the other superpower. Unforeseen consequences flared. Iraq, always something of a modern rogue state, invaded Kuwait. During the course of that conflict, Iraq poured oil into the Gulf and set fires to the oil fields.<sup>22</sup> On the allied side, questions still

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17. Rymn Parsons, *The Fight to Save the Planet: U.S. Armed Forces, "Greenkeeping," and Enforcement of the Law Pertaining to Environmental Protection During Armed Conflict*, 10 GEO. INT'L ENVTL. L. REV. 441, 442 (1998).

18. See Mark J. Osiel, *Ever Again: Legal Remembrance of Administrative Massacre*, 144 U. PA. L. REV. 463, 553 n.343 (1995).

19. See Stephen Dycus, *Nuclear War: Still the Gravest Threat to the Environment*, 25 VT. L. REV. 753 (2001).

20. See Steven M. Block, *The Growing Threat of Biological Weapons*, AM. SCIENTIST, Jan.-Feb. 2001, available at <http://www.signaxi.org/amsci/articles/01articles/Block.html> (last visited May 10, 2001).

21. Ross, *supra* note 5, at 518.

22. William M. Arkin, *The Environmental Threat of Military Operations*, in PROTECTION OF THE

- remain about the causes of the mysterious Gulf War syndrome, and the use of shells and other armaments containing depleted uranium;<sup>23</sup>
- The end of the Soviet Union as a dominant power also resulted in the break up of Yugoslavia, which led to internal strife between ethnic factions, allegations and evidence of human rights abuses and eventually, NATO's operation "Allied Force" to end the atrocities of an ultimately intra-national conflict. This armed conflict is also dogged by questions involving residual contamination by depleted uranium shells.<sup>24</sup> Another and potentially more significant issue that has caused critical comment in the Yugoslavian air campaign is collateral damage to the environment from destroying certain types of industrial targets. Most particularly, there has been concern and criticism over the bombardment of targets in the city of Pancevo, twelve miles from Belgrade.<sup>25</sup> Those attacks over a twenty-three day period included a petrochemical and fertilizer factory complex and airplane factory as targets;<sup>26</sup>
  - All of this is not to mention more than a century's use of cheap land mines and other hidden indiscriminate explosive traps. Millions of these persist in the environment today polluting the land and injuring and maiming innocents.<sup>27</sup>

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ENVIRONMENT, *supra* note 3, at 119; George K. Walker, *Oceans Law, the Marine Environment and the Law of Naval Warfare*, in PROTECTION OF THE ENVIRONMENT, *supra* note 3, at 185 (citing Philip Elmer-Dewitt, *A Man-Made Hell on Earth*, TIME, Mar. 18, 1991, at 36); Ronald A. DeMarco & John P. Quinn, *The Impact of War and Military Operations Other than War on the Marine Environment*, *Policy Making on the Frontiers of Knowledge in PROTECTION OF THE ENVIRONMENT*, *supra* note 3, at 93.

23. See *infra* notes 151-53 and accompanying text.

24. Depleted uranium has been used by Western military forces as an armor piercing round. It was developed to counter the expected waves of Soviet armored vehicles that were expected to lead an attack across the German plain that might change the Cold War into World War III. Depleted uranium, which is very dense and incendiary, is used in tank ammunition. Perhaps more environmentally problematic, it is now used as the projectile in 30mm ammunition used in the A-10 aircraft's GAU-8 Gatling gun. The A-10 aircraft was designed and built to be a Soviet tank killer in the heydays of the Cold War in the 1960s and 1970s. Its gun projects 3900 rounds per minute in a hail of fire as it was expected to swoop over Soviet armor formations. Its widespread operational use in Yugoslavia and the Gulf War brought with it the realization of problems from the large number of shells which miss their targets to either disintegrate or become shrapnel contaminating the ground. Over 30,000 rounds were used in Kosovo. UNEP Scientific Mission to Kosovo, *Depleted Uranium in Kosovo, Post Conflict Environmental Assessment*, at 10 (Nov. 2000) (released Mar. 13, 2001), available at <http://www.unep.ch/balkans> (last visited May 10, 2001). Other United Nations Environment Programme (UNEP) reports on the Balkans conflict are also available at <http://www.unep.ch/balkans>.

25. Schwabach, *supra* note 14, at 119.

26. *Id.* Schwabach quotes the city's mayor as reporting that the attacks released thousands of tons of potentially toxic chemicals including ammonia, ethylene dichloride, vinyl-chloride monomer, and chlorine. Quantities of these chemicals flowed into the Danube River. Schwabach also quotes a local attorney saying that the attacks released mercury into the groundwater. *Id.*

27. Iraq alone was responsible for some half million land mines remaining in Kuwait after the Gulf War. See *infra* note 149 and accompanying text.

Neither this list nor any other could be complete considering first the millennia during which humans have waged war, and second, humankind's capacity for cunning when faced with an armed adversary intent on doing it harm. Together, these factors demonstrate that over the centuries humans have continued to harm the environment as they undertake armed conflict. Perhaps an African proverb sums it up best: "When two elephants fight, it's always the grass that gets hurt."<sup>28</sup>

Within this list, a disturbing trend deserves note. With advancements in science and the development of modern technology, the lethality of weapons has increased dramatically, and so has the potential for environmental damage. A corollary to this is that the nature of modern industrial targets also creates the potential for accelerating environmental damage.<sup>29</sup>

When the Athenians and Spartans battled on the oceans, it was triremes against triremes. When Allied and Axis forces employed submarines during World War II, it was not just small wooden vessels that were sunk, but freighters and tankers carrying oil, ammunition, and chemicals that were spilled into the seas. During the Cold War, the United States used the seas as repositories for chemical weapons, and the Soviets used the seas for disposal of chemical weapons and nuclear devices such as scrapped reactors.<sup>30</sup>

Before the advent of the airplane, bombardment was limited to close range cannon, which were somewhat limited in the size and force of projectiles that could be used. Most of the weapons for bombardment were also limited in range by how they could be transported to the target. Artillery was largely limited in size and range by the animal power (primarily horses needed to move them), and in World War I, the limitation on larger weapons was the ability to lay rail track. Before the airplane, bombardment was limited to areas close to the battle front, areas that were largely evacuated by civilians and other innocents as the battle advanced. The airplane enabled weapons to be brought far into an enemy's rear area. World War II saw aerial bombardment hundreds of miles behind the battle front. But even then, when a power plant or power distribution station was hit, the prime consequences were shattered, burned metal and the disruption of power. Today it can mean setting fire to transformers and other modern technologies containing chemicals like PCBs, which if engulfed in flame, release dioxin.<sup>31</sup> The

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28. Mark Drumbl, *Waging War Against the World: The Need to Move from War Crimes to Environmental Crimes*, 22 FORDHAM INT'L L.J. 122 (1998) (quoting BEN JACKSON, POVERTY AND THE PLANET 150 (1990)).

29. See, e.g., *supra* notes 25-26 and accompanying text (describing reports from Pancevo in Serbia).

30. DeMarco & Quinn, *supra* note 22, at 93.

31. Leslie C. Green, *State Responsibility and Civil Reparation for Environmental Damage*, in PROTECTION OF THE ENVIRONMENT, *supra* note 3, at 416.

concern arising from the advances of science, technology, and weaponry is not only that more damage can be done, but that the type of damage done can be directly and collaterally much more severe.

## II. THE LAW OF WAR

The proven propensity of armed conflict to cause environmental damage is longstanding and increasingly great. This leads to the second inquiry: to what extent is past and current law able to curb war's potential for environmental harm.

Concern for harm to the environment by war is not a new concept under scholarship or law. The book of Exodus 23:29 records God's admonition to the Israelites as he sought to drive the Canaanites from what was to become their land: "I will not drive them out before thee in one year; lest the land become desolate, and the beasts of the field multiply against thee."<sup>32</sup> This is followed by the more well known biblical passage of Deuteronomy 20:19-20:

When thou shalt besiege a city a long time in making war against it to take it, thou shalt not destroy the trees thereof by wielding an axe against them; for thou mayest eat of them, but thou shalt not cut them down; for is the field man, that it should be besieged by thee? Only the trees that thou knowest are not trees for food, them thou mayest destroy and cut down, that thou mayest build bulwarks against the city that maketh war with thee, until it fall.<sup>33</sup>

The Muslim faith has similar proscriptions. The Qur'an commands that trees are not to be cut down and animals are not to be killed, except for food.<sup>34</sup> The Buddhist and Hindu faiths have similar principles.<sup>35</sup>

This Article will examine the current Law of War as an international regime.<sup>36</sup> Before 1977, the environment was not specifically referenced in a general Law of War treaty.<sup>37</sup> There are, however, ample references to the

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32. *Id.* (citing Exodus 23:29).

33. *Id.* at 417 (citing Deuteronomy 20:19-20).

34. Environmental Law Institute, *Addressing Environmental Consequences of War* 3 (1998) (background paper). The paper notes that "some Muslim armies included an officer who had the specific duty to ensure that 'trees are not burned, nor unjustifiably pulled out and that women, children, the elderly and unoffending priests or monks should not be harmed. He shall also ascertain that water and medicine are given to prisoners of war.'" *Id.* (citing ISLAM AND ECOLOGY 34 (Fazlun Khalid et. al. eds., 1992)).

35. *Id.* at 3.

36. Though a cursory discourse on the applicable Law of War principles appears in almost every article or treatise on the environmental consequences of war, some brief review is necessary to frame an understanding of the limits of the current Law of War strictures for protection of the environment and facilitate the following discussion.

37. Adam Roberts, *Environmental Issues in International Armed Conflict: The Experience of the*



protection of civilians and non-military property and, by implication, the environment. This body of law can be broken into three considerations:

- The legal authority to undertake war;
- Laws regarding combatants; and
- Humanitarian concerns and the conduct of military operations.

This Article will discuss the second and third factors in determining whether, and the extent to which, the Law of War contains adequate safeguards for the protection of the environment in modern conflicts. The first factor, the legal authority to undertake war, appears of little relevance to this discussion. Today's "wars" are not war in a traditional, international sense. Simply stated, the conflicts that are being waged constantly and repeatedly today are less in the traditional mode of one sovereign using armed force against another, such as Athens and Sparta, the Romans, the American Revolution, or the two World Wars. Rather, today's more numerous conflicts tend to be intra-national struggles that can result in some form of international "peacekeeping actions." Though notable in the extent to which they diverted world attention, wars such as those between Great Britain and Argentina over the Falkland Islands, the Iran-Iraq war of the mid 1980s, and Iraq's invasion of Kuwait in 1990, are less common than the constant conflicts underway, from guerillas in South America, the tribal factional fighting in Africa, or to Russia's attempt to cope with would be break-away provinces like Chechnya. As such, formal declarations of war are of less relevance.

### *A. Laws Regarding Combatants*

The laws regarding combatants are responsible for a great deal of the corpus of the Law of War that attempts to halt unnecessary suffering of other combatants and non-combatants.<sup>38</sup> It has a tradition as far back as 1139 A.D. when Pope Innocent II tried to ban crossbows because of the suffering they caused.<sup>39</sup>

Under the current Law of War, these concepts are best embodied in the series of Geneva Conventions that deal with the treatment of prisoners, the sick and wounded, and civilian and non-combatants.<sup>40</sup> For the most part, the

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1991 *Gulf War*, in PROTECTION OF THE ENVIRONMENT, *supra* note 3, at 229.

38. ARMY FIELD MANUAL 27-10, Ch.1, § I (1956), available at <http://faculty.ed.ummuc.edu/instanton/FM-10.htm> (last visited May 10, 2001).

39. Environmental Law Institute, *supra* note 34, at 4.

40. Geneva Convention for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field, Aug. 12, 1949, T.I.A.S. No. 3362; Geneva Convention for the Amelioration of the Condition of Wounded, Sick and Shipwrecked Members of Armed Forces at Sea, Aug. 12, 1949, T.I.A.S.

concepts these conventions address—the legal status of combatants, surrender, and prisoners of war and their treatment—have little relevance to our inquiry.

The third set of concepts, however, dealing with the *conduct* of hostilities, bear some relevance. They are based on the concept of the 1907 Hague Convention that “[t]he right of belligerents to adopt means of injuring the enemy is not unlimited.”<sup>41</sup> I will first discuss the general principles applicable to the conduct of military operations, and then note some pre- and post-1977 provisions that more specifically deal with environmentally related concerns.<sup>42</sup> In the next section, I will briefly review some of the specific treaty provisions dealing with protection of the environment from the means of war.

### 1. General Principles

The general rules regarding the conduct of war are normally broken down into four basic concepts:

- Necessity,
- Proportionality,
- Discrimination, and
- Humanity.<sup>43</sup>

#### a. Humanity

Humanity relates to avoiding unnecessary suffering. The concept of limiting employment of weapons causing unnecessary suffering was at the heart of one of the first modern attempts to develop an international Law of

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No. 3363; Geneva Convention Relative to the Treatment of Prisoners of War, Aug. 12, 1949, T.I.A.S. No. 3364; Geneva Convention Relative to the Protection of Civilian Persons in Time of War, Aug. 12, 1949, T.I.A.S. No. 3365.

41. The Hague Convention Respecting the Laws and Customs of War on Land, Oct. 18, 1907, art. 23, 36 Stat. 2277, 1 Bevans 631 [hereinafter Hague Convention].

42. As noted earlier, the term “environment” was not specifically included in the general Law of War treaties until 1977. See *supra* note 37 and accompanying text.

43. These are among the basic building blocks of the Law of War. See Richard Falk, *The Environmental Law of War: an Introduction*, in ENVIRONMENTAL PROTECTION AND THE LAW OF WAR 84-85 (Glen Plant ed., 1992); Carl E. Bruch & Jay E. Austin, *The 1999 Kosovo Conflict: Unresolved Issues in Addressing the Environmental Consequences of War*, 30 ENVTL. L. REP. (ENVTL. L. INST.) 10,069 (2000); Peter J. Richards & Michael N. Schmitt, *Mars Meets Mother Nature: Protecting the Environment During Armed Conflict*, 28 STETSON L. REV. 1047 (1999).

War, The Petersburg Declaration of 1868.<sup>44</sup> That conference was initiated in large part out of concern for a new form of exploding rifle bullet.<sup>45</sup>

### b. Necessity, Proportionality, and Discrimination

These three interrelated concepts—necessity, proportionality, and discrimination—are the cornerstone of the theory that a military action can comply with the modern Law of War. First, is an action necessary to achieve a military objective? Second, are the means used proportional to the military objective to be obtained. Third, is the weapon of attack chosen able to adequately discriminate between lawful and unlawful objectives? When an action does not meet these criteria, it is considered a prohibited indiscriminate attack.<sup>46</sup>

It is from these concepts that a construct under the Law of War emerges that may be useful to protect the environment. The concepts of necessity, proportionality, and discrimination are in addition to other more specific provisions of the international Law of War and other elements of international law that may protect the environment. These provisions, as discussed below however, are very limited and fail to offer any general framework for protection.

By its nature, it is hard to see that the environment, just as the civilian population, could be a military objective *per se*.<sup>47</sup> The environment represents neither the means to conduct war nor the means to sustain it. While the

44. FRITS KALSHOVEN, CONSTRAINTS ON THE WAGING OF WAR 12 (1987).

45. *Id.* See also THE LAWS OF WAR 48 (W. Michael Reisman & Chris T. Antoniou eds., 1994) [hereinafter THE LAWS OF WAR].

46. Protocol Additional to the Geneva Conventions and Relating to the Protection of Victims of International Armed Conflict, Aug. 12, 1949, 1125 U.N.T.S. 3, 26 [hereinafter Protocol I.] Protocol I states that:

Indiscriminate attacks are prohibited. Indiscriminate attacks are:

- (a) Those which are not directed at a specific military objective;
- (b) Those which employ a method or means of combat the effects of 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;

and consequently, in each such case, are of a nature to strike military objectives and civilians or civilian objects without distinction.

*Id.* art. 51(4). Protocol I has been accepted, but not ratified by the United States. Many would argue it represents a statement of customary international law; moreover, acceptance of a treaty creates an obligation on a state not to act inconsistent with the treaty until a state affirmatively makes clear its intention not to ratify the treaty. Vienna Convention on the Law of Treaties, May 23, 1969, art. 18(a), 1155 U.N.T.S. 331, 336, 25 I.L.M. 543, 556.

47. *But see* Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques, Dec. 10, 1976, 31 U.S.T.S. 333 [hereinafter ENMOD]. See also *infra* notes 97-98 and accompanying text.

environment is not per se a target of military necessity, the issue then becomes whether the environment may be damaged collaterally in an attack on an otherwise proper military objective.<sup>48</sup> The resolution of this issue invokes the principles of proportionality and discrimination in determining whether an attack on a military objective may lawfully include collateral environmental damage under the Laws of War.

Consider a dam that by itself is not a military objective. It would be protected by the principle of necessity in that there would be no military purpose in attacking it.<sup>49</sup> If, however, there were an enemy gun emplacement on it that blocked a force's advancement, the gun emplacement would be a valid military objective and susceptible to lawful attack under the principle of necessity. The issue then becomes what kind of force to use. The principles of discrimination and proportionality would mandate using only the available force necessary to eliminate the gun, but not the entire dam with the ancillary environmental consequences that would ensue.

Let us consider the concepts of necessity, discrimination, and proportionality individually and in more detail as they might serve to protect the environment.

### i. Necessity

This term contemplates that only those targets which if attacked and defeated would render a military advantage, are lawful military objectives.<sup>50</sup> Places that are not military objectives should not be attacked so as to avoid unnecessary suffering.<sup>51</sup> The relevant U.S. Army manual, after adopting the

48. The Law of War defines the obligation of military necessity by focusing on the protection of objects not related to the conduct or support of war. For instance:

1. Civilian objects shall not be the object of attack or of reprisals. Civilian objects are all objects which are not military objectives as defined in paragraph 2.
2. Attacks shall be limited strictly to military objectives. In so far as objects are concerned, military objectives are limited to those objects which by their nature, location, purpose or use make an effective contribution to military action and whose total or partial destruction, capture or neutralization, in the circumstances ruling at the time, offers a definite military advantage.

Protocol I, *supra* note 46, art. 52.

49. Article 56 of Additional Protocol I would also specifically prohibit an attack on a dam generally as a work controlling a dangerous force.

50. Protocol I, *supra* note 46, art. 52.

51. The attack or bombardment, by whatever means, of towns, villages, dwellings, or buildings which are undefended is prohibited. Hague Convention, *supra* note 41, art. 25. The 1977 Protocol I Additional to the Geneva Conventions of 1949 contains the following admonition:

Article 48—Basic Rule

In order to ensure respect for and protection of the civilian population and civilian objects, the Parties to the conflict shall at all times distinguish between the civilian population and combatants and between civilian objects and military objectives and

definition of military objectives from the 1977 amendments to the Geneva Conventions of 1949, provides the following examples of lawful military targets:

[F]actories producing munitions and military supplies, military camps, warehouses storing munitions and military supplies, ports and railroads being used for the transportation of military supplies, and other places that are for the accommodation of troops or the support of military operations.<sup>52</sup>

The Army also gives the examples of defended places as permissible objects of attack. They list:

- (1) A fort or fortified place.
- (2) A place that is occupied by a combatant military force or through which such a force is passing. The occupation of a place by medical units alone, however, is not sufficient to render it a permissible object of attack.
- (3) A city or town surrounded by detached defense positions, if under the circumstances the city or town can be considered jointly with such defense positions as an indivisible whole.<sup>53</sup>

This list of additional permissible military objects or objectives comes by way of negative implication from the concept that the attack of an undefended place is what is prohibited by the Law of War.<sup>54</sup> As such, it greatly expands what may be included in the concept of military objectives permissibly attacked under the principle of necessity.<sup>55</sup> Once a target is deemed a necessary military objective, the question then becomes, as in our earlier example of the gun emplacement on the dam, the extent to which an attack on such an objective is limited by the principles of discrimination and proportionality.

## ii. Discrimination

Discrimination relates to distinguishing between lawful military targets or objectives, as compared to non-combatants and their objects that are to be

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*accordingly shall direct their operations only against military objectives.*

Protocol I, *supra* note 46, art. 48 (emphasis added).

52. ARMY FIELD MANUAL, *supra* note 38, at Ch.2, § IV.40(c).

53. *Id.* at § IV.40(b).

54. Hague Convention, *supra* note 41, art. 25.

55. *Id.* "It is especially forbidden . . . to destroy or seize the enemy's property, unless such destruction or seizure be imperatively demanded by the necessities of War." *Id.* art. 23(g).

protected. The more well-known limitation from the principle of discrimination is the prohibition on the use of indiscriminate weapons.<sup>56</sup> Richards and Schmitt suggest that this concept has been incorporated into the Convention on the Prohibition of Military or any Other Hostile Use of Environmental Modification Techniques (ENMOD), which curtails use of the environment as a weapon.<sup>57</sup>

They suggest, however, that the more important concept from the discrimination principle is that it proscribes the indiscriminate *use* of any types of weapons.<sup>58</sup> That is, use to the extent that the weapons would fail to discriminate between military and non-military targets.<sup>59</sup> The embodiment of these concepts can be seen in Articles 51 and 57 of the 1977 Protocol I to the Geneva Conventions. Article 51 prohibits indiscriminate attacks and encompasses the concepts of humanity, necessity, discrimination, and proportionality.<sup>60</sup> Article 51(4)(b) specifically proscribes "those [attacks] which employ a method or means of combat which cannot be directed at a specific military objective."<sup>61</sup> The provision gives the example of "an attack by bombardment by any method or means which treats as a single military objective a number of clearly separated and distinct military objectives located in a city, town, village or other area containing a similar concentration of civilians or civilian objects."<sup>62</sup>

Article 57 deals with precautions required before making an attack.<sup>63</sup> Among the obligations are the following: to verify that the objects of attack are not civilians, civilian objects, or other prohibited targets; to take precautions in choosing the "means and methods of attack" to avoid or minimize civilian deaths and injuries or damage to civilian objects; and that armed forces should refrain from launching an attack if civilian casualties or damage to civilian objects would be "excessive in relation to the concrete and direct military advantage anticipated."<sup>64</sup> As an amplification of the concept of limiting damages and injury to military objectives, the provision also states

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56. Richards & Schmitt, *supra* note 43, at 1078. Richards and Schmitt cite biological weapons as an example. They are very difficult to detect. Once introduced they are almost impossible to control, as evidenced by the world's great epidemics; furthermore, they kill or maim indiscriminately.

57. *Id.* The Convention on the Prohibition of Military or any Other Hostile Use of Environmental Modification Techniques (ENMOD) was established in response to reported efforts by the United States to engage in rainmaking to frustrate North Vietnam and the Viet Cong's use of the Ho Chi Minh Trail and other logistics routes. See *infra* notes 106-08 and accompanying text.

58. Richards & Schmitt, *supra* note 43, at 1078.

59. Falk, *supra* note 43, at 84.

60. Protocol I, *supra* note 46, art. 51. See also *supra* note 46 and accompanying text.

61. Protocol I, *supra* note 46, art. 51(4)(b).

62. *Id.* art. 51(5)(a).

63. *Id.* art. 57.

64. *Id.* art. 57(2)(a)(iii).

that when "a choice is possible between several military objectives for obtaining a similar military advantage, the objective to be selected shall be that the attack on which may be expected to cause the least danger to civilian lives and civilian objects."<sup>65</sup>

There is an obvious potential for mischief in these prohibitions. A belligerent may choose to entwine military resources that are otherwise appropriate targets in the civilian population. For example, during the Gulf War, Iraq co-located a civilian air raid shelter with a military command and control bunker.<sup>66</sup> Such an action may be the basis for ignoring the basic prohibition. Moreover, Article 58 of the Protocol cautions a belligerent to protect civilian populations and objects from dangers posed by military operations, and specifically cautions to "avoid locating military objectives within or near densely populated areas."<sup>67</sup>

However, a belligerent may not have the luxury of choice in the methods of attack. Today, many of the world's conflicts seem to center in the third world among nations that do not have the diverse technologically sophisticated military resources of a world power. Yet, the conflicts they engage in may be just as harmful to civilians and the environment. This is particularly problematic with the increase in the lethality of modern weaponry possessed by third world nations, as well as the dangers posed by the rapidly increasing number of modern industrial facilities throughout the world such as those at Pancevo, which fall in the way of today's and tomorrow's armed conflicts.

### iii. Proportionality

Proportionality and discrimination are closely related.<sup>68</sup> Professor Falk defines the proportionality principle by stating that "[t]o be lawful, weapons and tactics must be proportional to their military objective. Disproportionate

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65. *Id.* art. 57(3).

66. Rick Atkinson & Dan Balz, *Bomb Strike Kills Scores of Civilians in Building Called Military Bunker by U.S., Shelter by Iraq*, WASH. POST, Feb. 14, 1991, at A1.

67. Protocol I, *supra* note 46, art. 58. While modern western forces proudly tout their development and use of "smart weapons" as a demonstration of their adherence to the concept of discrimination, the simple fact is that only a very small proportion of the world's weaponry falls into that category. The principles discussed are limited by feasibility, and there are only a handful of potential world belligerents. Principally, it is the United States that can afford the tens of thousands or hundreds of thousands of dollars for a single laser guided bomb or smart missile. In the steady and increasing number of conflicts, older Western and Soviet weapons systems like AK-47 machine rifles, SCUD missiles, and Kaytusha rockets, with no particular guidance systems other than a gunners eye and a wing and prayer, are used more often.

68. Richards & Schmitt, *supra* note 43, at 1078. Richards and Schmitt suggest that proportionality is a subset of discrimination. *Id.*

weaponry and tactics are excessive, and as such are illegal."<sup>69</sup> Definitions of proportionality tend to be confusing, but the key concept of the definition, and the heart of the concept of proportionality, is "excessive." This concept has roots in the desire to prevent unnecessary suffering.<sup>70</sup> Article 51 of Protocol I provides the example of a disproportionate attack: "[A]n attack which may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated."<sup>71</sup> Article 57(3) addresses choosing the form of attack least likely to result in civilian casualties and damage to civilian objects.<sup>72</sup> However, the principle is not limited to civilians and civilian objects. Reisman and Antoniou quote the late Waldemar Solf, long the head of the U.S. Army's International Affairs Division to illustrate this point:

[A]n obvious example that medical units cannot be exempted by law from suffering collateral damage is the existence of sickbays on men of war. If it were inadmissible to subject medical units to collateral damage, no attempt to sink a warship with a sickbay aboard would be permissible. In applying the proportionality test to the protection of medical units against collateral damage, everything depends on the concrete situation. The yardstick of proportionality is the concrete and direct military advantage expected. If a medical unit operates near an important firing position (which it often has to do), the neutralization of this position constitutes a great advantage for the enemy and the enemy is entitled to run the risk of causing a high degree of collateral damage within the medical unit as a result of an attack against the firing position. On the other hand, small and unimportant military objectives may not be attacked if this may be expected to cause important collateral damage within major medical units such as field hospitals.<sup>73</sup>

Two concepts from the Solf discussion are of concern as we look to current Law of War general principles to fashion a basis for environmental protection. Determinations of necessity, proportionality, and to a lesser extent, discrimination, are highly judgmental formulations. These judgments are made initially by military commanders in the heat of battle to secure a

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69. Falk, *supra* note 43, at 84.

70. THE LAWS OF WAR, *supra* note 45, at 37.

71. Protocol I, *supra* note 46, art. 51(5)(b).

72. See *supra* note 65 and accompanying text.

73. THE LAWS OF WARS, *supra* note 45, at 38.



military advantage.<sup>74</sup> As Solf notes, the Law of War's protections for civilians, medical personnel, or the environment are not absolute. Rather they are considerations made during wartime, balanced in some less than specific formula against strategic and tactical military needs. There is little guidance in the international law framework, and little jurisprudence to determine what factors should be balanced, let alone what weight should be given to those factors.<sup>75</sup>

The lack of a generally accepted balancing formula is of concern for many of the same reasons that most environmentalists have an incipient dislike of anything smacking of cost-benefit analysis. How is the cost of the environment to be valued? How does that value compare to that of human life or human suffering? Is certain immediate damage valued more than rough assumptions about future damage? How do these values weigh against values of military necessity—securing military objectives and minimizing a commander's casualties? To focus this discussion, consider two scenarios: (1) Should allied forces have accepted greater casualties and adopted a Gulf War strategy that used less environmentally harmful munitions and tactics? And (2) should NATO forces have used a less aggressive bombing campaign, thereby likely prolonging the war and increasing the likelihood of more humanitarian crimes and greater suffering by ethnic minorities?

74. A memorandum written by General Eisenhower provides an example:

Subject Preservation of Historical Monuments . . .

(3) In some circumstances the success of the military operation may be prejudiced in our reluctance to destroy these revered objects [i.e., historical monuments and cultural centers]. Then, as at Cassino, where the enemy relied on our emotional attachments to shield his defenses, the lives of our men are paramount. So, where military necessity dictates, commanders may order the required action even though it involves the destruction of some honored site.

Memorandum from General Eisenhower to Subordinate Commanders (May 26, 1944), reprinted in *THE LAWS OF WAR*, *supra* note 45, at 96-97 [hereinafter Memo from Gen. Eisenhower]. The memorandum goes on to request the commander's restraint and discipline when "damage and destruction are not necessary and cannot be justified," but the implication of the preceding quoted paragraph is clear—the lives of our men are paramount, and thus any balancing equation in a commander's eyes will likely be weighed heavily in the preservation of his means to fight. *Id.*

75. Cases in Law of War tribunals regarding environmental damage as a result of wartime activities are scarce. Professor Roberts cites two cases arising from World War II which provide background in his article. See generally Roberts, *supra* note 37. In one case, the U.N. War Crimes Commission determined that nine of ten German civil administrators could be listed as war criminals for their complicity in cutting down Polish timber. Adoption of scorched earth policies were listed among the war crimes tried by the International Military Tribunal at Nuremberg. Such allegations were included in charges against a number of senior Nazi war criminals and were, in part, the basis for General Jodl's conviction. In another case, however, a German general was found not guilty of war crimes by a U.S. military tribunal in Nuremberg after adopting a scorched earth policy to protect his German forces by slowing advancing Soviet troops. The court commented that the commander had committed an error of judgment but not a criminal act.

What is lacking in this set of rules is some empirical norm—a norm where harm to the environment and the humans who depend on it is no longer tolerated for any purpose.<sup>76</sup> The Law of War has some provisions along this vein, mostly in Protocol I, but each provision presents its own problems.

### *B. Specific Provisions*

It was noted earlier that the term “environment” did not enter the formal lexicon of the Law of War until Protocol I. As discussed above, prior to 1977 there were general prohibitions in the Law of War that could serve to protect the environment. One example is the admonition in Article 23(g) of the Annex to the Hague Land Warfare Convention of 1907, which forbids the destruction or seizure of “the enemy’s property, unless such destruction or seizure be imperatively demanded by the necessities of war.”<sup>77</sup> By implication, the environment also is protected to some extent under the provisions of the Geneva conventions that deal with the protection of civilians and civilian property.

However, Section III of the Hague Resolutions dealing with military occupation does have provisions that more directly implicate environmental protection.<sup>78</sup> Of these, Article 55 may be the most explicit: “The occupying State shall be regarded only as administrator and usufructory of public buildings, real estate, forests, and agricultural estates belonging to the hostile State, and situated in the occupied country. It must safeguard the capital of these properties, and administer them in accordance with the rules of usufruct.”<sup>79</sup> The obvious limitation of this provision is that it only pertains to territories in occupation—when territory is actually under authority of a hostile army.<sup>80</sup> Geneva Convention (IV) dealing with protection of civilians in wartime has extensive provisions regarding occupation, which is somewhat logical, given that the immediate frame of reference for that treaty was Japan’s and Germany’s occupation practices during World War II. However, as also might be expected, the vast bulk of the Geneva Convention provisions deal with protection of persons rather than real property or the environment.

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76. Professor Falk suggests that the principles discussed above could have been extended and molded into a workable scheme for environmental protection if there had been sufficient political will. See Falk, *supra* note 43, at 88.

77. Hague Convention, *supra* note 41, accord Geneva Convention Relative to the Protection of Civilian Persons in Time of War, Aug. 12, 1949, art. 53, 6 U.S.T. 3516, 75 U.N.T.S. 287. [hereinafter Geneva Convention—Protection of Civilians].

78. Roberts, *supra* note 37, at 230.

79. Hague Convention, *supra* note 41, art. 55.

80. *Id.* art. 42. The convention requires that the hostile force establish and exercise its authority over the occupied territory. *Id.*

The parallel provision in the Geneva Convention is more limited in protection than Hague Convention Article 55: "Any destruction by the occupying power of real or personal property belonging individually or collectively to private persons, or to the State, or to other public authorities, or to social or cooperative organizations is prohibited except where destruction is rendered absolutely necessary by military operations."<sup>81</sup> The Hague Convention provision ties the right of occupiers to the concept of usufruct. This concept essentially allows enjoyment of the benefits of property, but not the right to damage it. On the other hand, the Geneva Convention provision allows property damage in the interest of "military necessity." The Geneva Convention provision also fails to incorporate specific protection of forests, as it may imply a broader concept of environmental protection.

The 1907 Hague Convention also provides specific protection for cultural resources.<sup>82</sup> This protection was expanded by the Convention for the Protection of Cultural Property in the Event of Armed Conflict, which broadened the definition of cultural property protected:

Article 1. 1. For the purposes of the present Convention, the term cultural property shall cover, irrespective of origin or ownership:

(a) movable or immovable property of great importance to the cultural heritage of every people such as monuments of architecture, art or history, whether religious or secular; archaeological sites; groups of buildings which, as a whole, are of historical or artistic interest; works of art, manuscripts, books and other objects of artistic, historical or archaeological interest as well as scientific collections and important collections of books or archives or of reproductions of the property defined above;

(b) buildings whose main and effective purpose is to preserve or exhibit the movable cultural property defined in sub-paragraph (a) such as museums, large libraries and depositories of archives, and refuges intended to shelter, in the event of armed conflict, the

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81. See generally Geneva Convention—Protection of Civilians, *supra* note 77.

82. Hague Convention, *supra* note 41, art. 27. "In sieges and bombardments all necessary steps must be taken to spare, as far as possible, buildings dedicated to religion, art, science, or charitable purposes, historic monuments, hospitals, and places where the sick and wounded are collected, provided they are not being used at the time for military purposes." *Id.* While this is a broad sounding prohibition on damage, consider General Eisenhower's formulation of the balancing test and how that was interpreted by his field commanders. Memo from Gen. Eisenhower, *supra* note 74. Article 53 of Protocol I Additional to the Geneva Conventions of 1949 also provides for protection of cultural resources. Protocol I, *supra* note 46, art. 53.

movable property defined in sub-paragraph (a);

(c) centers containing a large amount of cultural property as defined in sub-paragraphs (a) and (b), to be known as "centres containing monuments."<sup>83</sup>

The convention also creates obligations to protect defined cultural properties from damage during military hostilities.<sup>84</sup>

As noted, Protocol I brought the first specific environmental protection provisions into the general Law of War.<sup>85</sup> Protocol I has not been ratified by the United States, but adherence to its primary provisions for environmental protection, Articles 35(3) and 55, have been officially cited by the United States as a principle of international law.<sup>86</sup>

Article 35 deals with the basic rules for the means and methods of warfare. It starts by restating the established Law of War principles. First, that the methods and means of warfare are not unlimited.<sup>87</sup> Second, that states are obligated to avoid superfluous injury or unnecessary suffering.<sup>88</sup> It continues with a third principle of environmental protection: "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."<sup>89</sup> The importance of this addition to the basic rules is complimented by Article 36, which obligates parties to evaluate "[i]n the study, development, acquisition or adoption of a new weapon, means or method of warfare whether the proposed weapon, means or method if employed would" in some or all circumstances, be prohibited under international law.<sup>90</sup> This now includes the specific prohibition of Article 35(3) on weapons that may cause "widespread, long-term and severe damage" to the environment.<sup>91</sup> Article 35(3) is also bolstered by Article 55 of Protocol I:

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83. Convention for the Protection of Cultural Property in the Event of Armed Conflict, May 27, 1949, art.1, 249 U.N.T.S. 215.

84. *Id.* arts. 3-4.

85. ENMOD, *supra* note 47, will be discussed in the next section dealing with specific international instruments for environmental protection.

86. *Letter from the Permanent Missions of the Hashemite Kingdom of Jordan and of the United States of America to the U.N. General Assembly* (Sept. 28, 1992), reprinted in *THE LAWS OF WAR*, *supra* note 45, at 71.

87. Protocol I, *supra* note 46, art. 35(1).

88. *Id.* art. 35(2).

89. *Id.* art. 35(3).

90. KALSHOVEN, *supra* note 44, at 81.

91. Protocol I, *supra* note 46, art. 55.

**Article 55—Protection of the Natural Environment**

1. Care shall be taken in warfare to protect the natural environment against widespread, long-term and severe damage. This protection includes a prohibition of the use of methods and means of warfare which are intended or may be expected to cause such damage to the natural environment and thereby to prejudice the health or survival of the population.
2. Attacks against the natural environment by way of reprisals are prohibited.<sup>92</sup>

Both articles 35(3) and 55 use the terms “widespread, long-term and severe damage.” The list is inclusive—apparently all three factors must be present. Further and notably, the term “long-term” has been interpreted to mean several decades.<sup>93</sup> Both provisions are further limited to proscribe those means of war “intended or expected” to cause damage.<sup>94</sup> In sum, while these provisions for the first time articulate a concept of environmental protection, they only protect against the most substantial form of damage, and then only when the damage is intended or expected. They fall far short of a regime that creates personal or monetary liability for environmental damages caused by the more common, but nonetheless damaging, practices of war. Commentators have noted that:

Arts. 35(3) and 55 will not impose any significant limitation on combatants waging conventional warfare. It seems primarily directed to high level policy decision makers and would affect such unconventional means of warfare as the massive use of herbicides or chemical agents which could produce widespread, long-term and severe damage to the natural environment.<sup>95</sup>

Protocol I contains two other potentially relevant provisions. Article 54 prohibits destruction or rendering useless products of agriculture or water supplies to deny subsistence, subject to some specified consideration of military need.<sup>96</sup> Article 56 protects certain facilities containing “dangerous forces.”<sup>97</sup> Article 56, however, is specifically limited to dams, dikes, and nuclear generating stations. The Article is further limited and does not apply

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92. *Id.*

93. KALSHOVEN, *supra* note 44, at 81.

94. *Id.*

95. Roberts, *supra* note 37, at 233 (quoting Professors Bothe, Partsch, and Solf).

96. Protocol I, *supra* note 46, art. 54.

97. *Id.* art. 56.

when a facility directly supports a belligerent's military capabilities.<sup>98</sup> In the event such a facility is attacked, there is an admonition to take "all practical precautions . . . to avoid the release of the dangerous forces."<sup>99</sup> What Article 56 does not cover are industrial facilities, which were the subject of the Pancevo attack, and other industrial facilities that might release toxic clouds. Efforts to include such facilities under Article 56 were attempted but unsuccessful.<sup>100</sup> The International Committee of the Red Cross (ICRC) commentary accompanying the provision suggests that such facilities may be covered under Article 55.<sup>101</sup>

Professor Falk offers two other theories based on the general Law of War that may offer protection to the environment.<sup>102</sup> The first is based on the established principle of neutrality.<sup>103</sup> In essence, it is a violation of the Law of War to violate the sanctity, and therefore assumedly the environment, of a neutral nation. Therefore, it would be an illegal act for one belligerent's action to cause environmental harm sufficiently widespread to harm the environment of a neutral nation. The second theory is based on the international law principle of inter-generational equity which contends that it is a violation of the Law of War to employ weapons or tactics that would adversely affect the unborn.<sup>104</sup> Damage to the environment caused by war may well affect future generations and also be violative of this principle.

As can be seen from this discussion, the general Law of War principles offer constructs which may serve to protect the environment. However, they are philosophical constructs that almost universally lack the test and confirmation that comes through successful enforcement. They are also largely based on balancing tests that have no evident weighting formula and are prone to great ambiguity. Even the more specific principles of Protocol I lack strength due to vague and uncertain wording. Further, these principles lack strength because many powers have yet to become parties to Protocol I.

### III. INTERNATIONAL LAW'S PROTECTION OF THE ENVIRONMENT FROM WAR

There are too many treaties that offer some protection of the environment, such that a complete review is not feasible in an article of this size. With some 900 treaties now offering some form of environmental

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98. *Id.*

99. *Id.*

100. Roberts, *supra* note 37, at 235.

101. *Id.*

102. Falk, *supra* note 43, at 85.

103. *Id.*

104. *Id.*

protection, Professor Edith Brown-Weiss has termed the situation "treaty congestion," emphasizing the need to go from creating treaties to developing methods of implementation and enforcement.<sup>105</sup>

There are several treaties which have as their central focus protection of the environment from war-related activities. The most well known is ENMOD.<sup>106</sup> It states in part:

#### Article 1

1. Each State party to this convention undertakes not to engage in military or any 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.
2. Each State Party to this convention undertakes not to assist, encourage or induce any State, group of States or international organization to encourage activities contrary to the provisions of paragraph 1 of this article.

#### Article 2

As used in Article 1, the term "environmental modification techniques" refers to any technique for changing—through the deliberate manipulation of natural processes—the dynamics, composition or structure of the Earth, including its biota, lithosphere, hydrosphere and atmosphere or of outer space.<sup>107</sup>

One criticism of ENMOD is that it covers harm from environmental modification techniques, a term that contemplates the kinds of methods used by villains in science fiction rather than conventional warfare. The key to this concept is in Article 2's definition of environmental modification techniques, which requires the "deliberate manipulation of natural processes."

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105. Le Grand, *supra* note 7, at 29. An example of the need to not only consider the substance of environmental law, but the methods for enforcement is the Gulf War and Iraq's setting fire to the oilfields and spilling oil into the Persian Gulf. These actions on their face would be violations of Article 55 of Protocol I regarding the causing of "widespread, long-term and severe damage" to the environment. Yet in the aftermath of the war these were not pursued as a violation of the Law of War. One problem to pursuing them was that neither Iraq nor several members of the allied coalition (including the United States) were parties to Protocol I. There were also questions as to whether the nature of the damage was of sufficiently long expectation to trigger the Article 55 criteria. Lastly, there were concerns that the two actions might have had military purposes: the burning of the oil fields and ensuing smoke to obscure the optical systems of allied smart weapons, and the spilling of oil into the Gulf to forestall an amphibious landing and to deny the coalition potable water. See THE LAWS OF WAR, *supra* note 45, at 69; Roberts, *supra* note 37, at 239-42, 247-49.

106. ENMOD, *supra* note 47.

107. *Id.*

On the other hand, ENMOD goes farther than Protocol I in that the list of environmental impairment is phrased in the disjunctive: "widespread, long-lasting *or* severe" rather than requiring all factors to be present.<sup>108</sup> On the whole, however, it remains a somewhat toothless artifact to either environmental protection or limiting damage caused by war, prompting the comment: "I consider [ENMOD] one of the most unimportant international conventions I ever came across."<sup>109</sup>

Two other conventions relating to war and the environment deserve mention in terms of their ability to contribute to the structure of environmental protection from activities related to war. The earliest is the Hague Declaration (IV,2) Concerning Asphyxiating Gases (1899), stating simply that "[t]he Contracting Powers agree to abstain from the use of projectiles the sole object of which is the diffusion of asphyxiating or deleterious gases."<sup>110</sup> This is supplemented by the 1925 treaty which is phrased in terms of the prohibition on the use of "asphyxiating, poisonous or other gases, and of all analogous liquids, materials or devices."<sup>111</sup> This convention also proscribes use of bacteriological weapons.<sup>112</sup>

Biological weapons are also the subject of a 1972 treaty which has now been ratified by the United States.<sup>113</sup> Under the convention, parties agree never to:

[D]evelop, produce, stockpile or otherwise acquire or retain:

1. Microbial or other biological agents or toxins whatever their origin or method of production, of the types and in the quantities that have no justification for prophylactic, protective or other peaceful purposes;

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108. *Id.*

109. PROTECTION OF THE ENVIRONMENT, *supra* note 3, at 80-81 (quoting Dr. Dieter Fleck, Director of International Agreements and Policy, Federal Ministry of Defense, in Bonn, Germany).

110. The Hague Declaration (IV,2) Concerning Asphyxiating Gases, July 29, 1899, 187 Consol. T.S. 453.

111. Protocol for the Prohibition of the Use in War 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. Of some controversy is whether use of riot control gases is prohibited by this convention. The United States takes the position that they are not. The United States has also taken the position that it is permissible to retaliate to chemical or biological attacks in kind. See THE LAWS OF WAR, *supra* note 45, at 59.

112. Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare, *supra* note 111.

113. Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and Their Destruction, Apr. 10, 1972, 26 U.S.T. 583 [hereinafter Convention on Biological Weapons]. The treaty was ratified by the Senate in 1997 with 28 conditions. *To Advise and Consent to the Ratification of the Chemical Weapons Convention, Subject to Certain Conditions*, S. Res. 75, 105th Cong. (1997).



2. Weapons, equipment or means of delivery designed to use such agents or toxins for hostile purposes or in armed conflict.

Parties to the convention agree to destroy their warfare stocks of biological weapons or convert them to peaceful use. They also agree to forswear assisting others in the creation of biological weapons.<sup>114</sup>

There are other declarations dealing with environmental protection and other sources of international law that deal with environmental destruction due to military activities. The 1972 United Nations Conference on the Environment (Stockholm Convention), perhaps the seminal starting point for international environmental law, contains as its last principle that: "Man and his environment must be spared the effects of nuclear weapons and all other means of mass destruction. States must strive to reach prompt agreement, in the relevant international organs, on the elimination and complete destruction of such weapons."<sup>115</sup>

In the 1970s, during the heat of the nuclear arms race, the main threat to the environment from warfare appeared to be weapons of mass destruction, not the death by a thousand cuts to the environment from prolonged conventional warfare. During the early 1970s the Vietnam War raged on. At least one commentator suggests that the topic of environmental damage caused by conventional war was intentionally left off of the conference agenda because of environmentally-related tactics used by the United States.<sup>116</sup>

The 1992 Rio Declaration contains two provisions amplifying the words in the Stockholm declaration and also placing the concepts more in the context of modern times:

**Principle 23**

The environment and natural resources of people under oppression, domination and occupation shall be protected.

**Principle 24**

Warfare is inherently destructive of sustainable development. States shall therefore respect international law providing protection for the environment in times of

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114. Convention on Biological Weapons, *supra* note 113, arts. 2-3.

115. Report on the United Nations Conference on the Human Environment, princ. 26, U.N. Doc. A/CONF. 48/14 (1972), *reprinted in* 11 I.L.M. 1416.

116. Falk, *supra* note 43, at 86.

armed conflict and cooperate in its further development as necessary.<sup>117</sup>

In Principle 24, the Rio Declaration backs away from the Stockholm Declaration's focus on nuclear weapons and other weapons of mass destruction as those of the greatest environmental concern. It replaces that focus with one that calls for nations to respect the current international law regimes that implicitly would protect the environment. These would be the same regimes that have been discussed and have been found to be vague in so many ways. The Rio Declaration suggests that there should be further development of those principles, but only if necessary, and it does not suggest areas that are ripe for refinement.

However, Principle 23 may be more interesting because it talks not only in terms of a need to protect the environment during times of traditional war, for example the status of occupation, but also in terms of when people are dominated or oppressed. It also suggests that there is an absolute right to environmental protection and not one balanced by the needs of the belligerent parties. These concepts of people under domination or oppression broaden the right to environmental protection not only to those under the classic concepts of war, but to the full myriad of armed conflicts fueled by today's over-availability of modern weaponry.

As has been mentioned, a concern of this Article is that the most common type of armed conflict has changed from international conflict between State parties, which heretofore has been the focus of the Law of War, to more diffuse conflicts between warring factions or tribes. This conflict is predominantly intra-national, although it may adopt an international component through multinational peacekeeping activities.

#### IV. MILITARY OPERATIONS OTHER THAN WAR

The end of the Cold War has seen a dramatic change in the type of military operations taking place in the world. Prior to the fall of the Berlin Wall, most of the concern focused on conflict with nuclear weapons and other weapons of mass destruction. Since that time, the emphasis has been on smaller regional or intra-national conflicts. Most of these conflicts remain, or at least start out, as intra-national.

The Pentagon uses the phrase "Military Operations Other than War" (MOOTW) when U.S. forces become involved, and defines the term as "the

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117. Rio Declaration on Environment and Development, princs. 23-24, U.N. Doc. A/CONF. 151/5/Rev. 1 (1992), *reprinted in* 31 I.L.M. 874.

use of military capabilities across the range of military operations, short of war."<sup>118</sup> These operations conducted by military forces run the gamut from consensual to non-consensual intervention and include peacekeeping, counter-drug operations, non-combatant evacuation operations, humanitarian assistance, and disaster relief.<sup>119</sup> This is in addition to those armed conflicts that remain intra-national such as when a guerilla liberation army engages established national forces. These can be as devastating as any international armed conflict, particularly when the national forces are equipped and depend on massive firepower.<sup>120</sup>

Intra-national military conflicts were largely unaddressed under the Law of War until the development of Protocol II to the Geneva Conventions of 1949.<sup>121</sup> Protocol II deals with internal armed conflicts and was a response to

118. Bruce A. Harlow & Michael McGregor, *International Environmental Law Considerations During Military Operations Other than War*, in PROTECTION OF THE ENVIRONMENT, *supra* note 3, at 327.

119. *Id.* at 328.

120. KALSHOVEN, *supra* note 44, at 61. Kalshoven suggests the situation is further exacerbated in ideological or religious conflicts or where enemies are otherwise characterized as barbarians. *Id.*

121. Protocol II Additional to the Geneva Conventions Relative to the Protection of Victims of Non-international Armed Conflicts, June 8, 1977, reprinted in 16 I.L.M. 1442 [hereinafter Protocol II]. The exception was Article 3 expressing solely humanitarian concerns, which was common to the 1949 series of Geneva Conventions, and which provided:

In the case of an armed conflict not of an international character occurring in the territory of one of the High Contracting Parties, each Party to the conflict shall be bound to apply, as a minimum, the following provisions:

(1) Persons taking no active part in the hostilities, including members of armed forces who have laid down their arms and those placed *hors de combat* by sickness, wounds, detention, or any other cause, shall in all circumstances be treated humanely, without any adverse distinction founded on race, colour, religion or faith, sex, birth or wealth, or any other similar criteria.

To this end, the following acts are and shall remain prohibited at any time and in any place whatsoever with respect to the above-mentioned persons:

- (a) violence to life and person, in particular murder of all kinds, mutilation, cruel treatment and torture;
- (b) taking of hostages;
- (c) outrages upon personal dignity, in particular humiliating and degrading treatment;
- (d) the passing of sentences and the carrying out of executions without previous judgment pronounced by a regularly constituted court, affording all the judicial guarantees which are recognized as indispensable by civilized peoples.

(2) The wounded sick and shipwrecked shall be collected and cared for.

An impartial humanitarian body, such as the International Committee of the Red Cross, may offer its services to the Parties of the conflict. The Parties to the conflict shall endeavor to bring into force by means of special agreements, all or part of the other provisions of the present convention .

increasing wars of liberation and so-called guerilla warfare. However, like its earlier Geneva Convention predecessors, it is focused more on humanitarian concerns. The possible exception that has been suggested as a basis for environmental protection under the Protocol derives from Articles 13 through 15, which include the concept of protection of natural resources necessary for the survival of the civilian population.<sup>122</sup> Even then, Protocol II only comes into play when there is armed conflict that has the necessary level of intensity and is between armed forces and "[d]issident armed forces or other organized armed groups, which under responsible command, exercise such control over part of its territory as to enable them to carry out sustained and concerted military operations. . . ."<sup>123</sup>

There are at least three major omissions in the coverage of Protocol II. First, it does not apply if there are warring factions and the state's armed forces are not among the belligerents.<sup>124</sup> Second, there is a list of conditions that must be met by the state belligerent.<sup>125</sup> Third, there are a wide range of otherwise environmentally disruptive activities that fall below the necessary level of organized violence that is the threshold for the Protocol II definition of an armed conflict.<sup>126</sup> Absent the application of Protocol II, with its admittedly weak provisions to protect the environment, all that remains is recourse to national law in intra-national armed conflicts.

Where another country becomes involved, international law may apply. More recently these have taken the form of international peacekeeping activities. Since 1998, the United Nations Security Council has ordered more peacekeeping operations than in the preceding forty years.<sup>127</sup> U.S. military

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*Id.* art. 3.

122. Raul Vinuesa, *Comment: The Existing Legal Framework: Protecting the Environment During Non-International Armed Conflict Operations Involving the Use of Force (i.e. Military Operations Other Than War (MOOTW))*, in PROTECTION OF THE ENVIRONMENT, *supra* note 3, at 350. Article 13 provides the civilians a general protection against dangers arising from military operations, Article 14 protects "objects indispensable to the survival of the civilian population." Article 15 contains a parallel to Protocol I's protection on facilities with dangerous forces. Kalshoven notes that Protocol II does not contain the exception for military targets. Article 16 protects cultural resources. See KALSHOVEN, *supra* note 44, at 143-44.

123. Protocol II, *supra* note 121, art. 1. See also Vinuesa, *supra* note 122, at 346; KALSHOVEN, *supra* note 44, at 137.

124. KALSHOVEN, *supra* note 44, at 138.

125. *Id.* A worrisome aspect of Protocol II is that the insurgent group must be for all practical purposes an organized army—under responsible command, control territory, conduct sustained military operations, and be able to carry out the Protocol—while it would seem that an otherwise lethal group of irresponsibly led rabble only bent on terror, as opposed to control of property, are exempt from any Protocol II requirements.

126. *Id.* at 137.

127. Karen Fair, *Environmental Compliance in Contingency Operations: In Search of a Standard*, 157 MIL. L. REV. 112, 113 (1998).

forces were deployed over twenty-five times in the 1990s for peacekeeping missions.<sup>128</sup>

It is not clear, however, whether peacekeeping activities are enough to trigger invocation of Law of War and other international law protections. One commentator, Raul Vinuesa, draws a distinction between a traditional international armed conflict and peacekeeping as a third party intervention authorized by an international or regional body into an *internal* armed conflict.<sup>129</sup> Vinuesa suggests bypassing this dilemma through governmental arrangements and specific rules of engagement for the peacekeeping forces.<sup>130</sup> He goes on to suggest that the unilateral nature of rules of engagement is a problem.<sup>131</sup> There is also a problem with governmental agreements between the ruling government and the governments supplying peacekeepers, because such a concept presupposes that a government fighting to protect its immediate collapse will be sufficiently magnanimous and broad-minded to embrace what may be viewed as the less immediate concern of environmental protection.

A brief review of some of the major deployments of U.S. forces in MOOTW in the 1990s underscores both the fragile nature of the governments under siege and the potential for environmental damage.

#### A. 1992 Operation Restore Hope (Somalia)

This intervention was conducted under the authority of United Nations Security Council Resolution 794.<sup>132</sup> At the time of the intervention, Somalia lacked both a functioning government and a legal system for environmental protection.<sup>133</sup> Post-action reports of the U.S. forces indicate that environmental issues were a low priority, and that during the course of the operation confiscated arms and ammunition were dumped into the ocean in apparent violation of the London Dumping Convention.<sup>134</sup>

128. *Id.*

129. Vinuesa, *supra* note 122, at 347. Vinuesa also suggests the possibility that while the foreign peacekeeper engaged in armed conflict may be bound by the Law of War, the internal belligerents may not. *Id.* at 348.

130. *Id.* at 349.

131. *Id.*

132. Fair, *supra* note 127, at 129.

133. *Id.* at 130.

134. *Id.* at 130-31. The Fair article contains a fascinating glimpse into the view of a military officer faced with an operational dilemma:

[I]n a political environment such as existed in Somalia that tolerated the starvation of children, considerations about where to dispose of motor oil [could actually] be meaningless. When the resources barely exist to provide humanitarian assistance and the host country could care less about environmental stewardship . . . there may

*B. 1994 Operation Uphold Democracy (Haiti)*

This intervention commenced under authority of U.N. Security Council Resolution 940.<sup>135</sup> Its initial purpose was to oust the current Haitian government from power.<sup>136</sup> Ultimately, former President Carter, Retired Joint Chiefs of Staff Chairman Powell, and Senator Nunn secured agreement from the government that they would step down. At that point the new Haitian government indicated it would cooperate with environmental planning to support the peacekeepers; however, Haitian environmental law was sparse at best.<sup>137</sup> Furthermore, Haiti was a very poor country beset with poverty and widespread and devastating soil erosion.<sup>138</sup> U.S. post-action reports again found that the forces were inadequately equipped to provide environmental protection that would have been considered rudimentary in the United States.<sup>139</sup>

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not be a convincing need to implement stringent environmental law programs.

*Id.* at 129 n.60.

This glimpse brings to mind Maslow's classic "hierarchy of needs" in psychology—that the human condition does not consider everything important to the same degree. Rather at the foremost are basic survival needs, then organizational needs, then leading up the continuum to other socio-cultural concerns. The issue becomes one of man's perception of where the environment and protection of the environment fit within that continuum.

This expressed concern also talks in terms of limited resources and application of infamous cost/benefit concepts as they are applied to health/environmental concerns: How does disposal of motor oil weigh against ending starvation of children? Who makes those decisions? This brings up a theme that is discussed in Part I: deploying military forces, whether for combat, peacekeeping, or any other mission (including training) must bring with them what they will use and need. This includes equipment, supplies, their definition of what is to be done, and those practices they will use to complete that mission. That means that the forces in the field are left with what they have brought and their adaptability. For environmental concerns to be part of a military operation, the value of protecting the environment must be clearly expressed at the highest authority levels, and those authority levels must ensure that deploying troops have the tools and understanding they need to meet that objective. This may mean extra time training in the collection of used motor oil, bringing with them the resources that are needed to collect and if necessary dispose of the oil. It is simply too late when such concerns are "added on" after troops are in the field.

135. *Id.* at 131.

136. *Id.*

137. *Id.* at 132-33.

138. *Id.* at 131 n.68.

139. *Id.* Examples were drums for hazardous waste collection and disposal, vehicle drip pans, spill response equipment, and sufficient field latrines. *Id.* The need for education about potential environmental problems, providing needed and adequate equipment and staff to prevent environmental problems, and the need for better environmental planning were all identified as needs for future missions. *See id.*

*C. 1995 Operation Joint Endeavor-Joint Guard (Bosnia)*

This deployment was in response to U.N. Security Resolution 1031 authorizing "'all necessary measures' to protect the United Nations Peacekeeping Force."<sup>140</sup> Initially, twenty-five nations provided some 60,000 troops for the deployment.<sup>141</sup> Bosnia, though subject to civil strife, had a more developed set of environmental laws that could be followed by the peacekeepers.<sup>142</sup> Problems did arise, however, from the need to coordinate environmental programs between the twenty-five peacekeeping nations and the host government.<sup>143</sup> An interesting problem during the Bosnia operation was compliance with the Basel Convention.<sup>144</sup> Neither the United States nor Bosnia were parties to the agreement, which prevents member nations from receiving wastes from non-members absent a separate multi-lateral or bilateral agreement. This necessitated a series of transit and disposal agreements with neighboring nations to assure the safe disposal of hazardous waste generated by the peacekeeping mission.<sup>145</sup>

Bosnia, Haiti, and Somalia reveal the environmental protection problems that military forces face in only a peacekeeping role, even though they are not involved in armed conflict. The potential for environmental harm becomes substantially more troubling once combat is engaged.

Earlier in this Article, references were made to the Gulf War and the 1999 Yugoslavian (Kosovo) conflict.<sup>146</sup> Both conflicts left areas contaminated with the by-products of modern weaponry. Approximately twenty million cluster bomblets littered the Gulf War theater, the product of over 61,000 cluster bombs used by the Coalition Forces.<sup>147</sup> Many of the bomblets remain today, killing and maiming the survivors of the conflict.<sup>148</sup> So do many of the

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140. *Id.* at 134 n.81 and accompanying text.

141. *Id.*

142. *Id.* at 134.

143. *Id.*

144. *Id.* at 136. See also The Basel Convention of the Control of Transboundary Movements of Hazardous Waste and their Disposal, Mar. 22, 1989, 28. I.L.M. 657.

145. Fair, *supra* note 127, at 137. Discussion of the Basel Convention could be (and often is) material for a full length article. Suffice it to say that improper management or disposal of hazardous wastes are serious and lingering threats to the environment, and that modern military equipment requires a substantial number of hazardous materials for maintenance and use which become waste after use in the field. While the thrust of this Article is on environmental problems caused by armed conflict, it is also true that deployment of modern military forces to the field brings with it a host of environmental problems caused primarily by the logistical "tail" of the combatant/peacekeeping force. These environmental problems are the focus of the Fair article. *Id.*

146. See *supra* notes 22-26 and accompanying text.

147. Arkin, *supra* note 22, at 125.

148. Of particular concern was the high "dud" rate of unexploded bomblets that remain explosive and dangerous to any unsuspecting soul that encounters one. While the manufacturers of the weapons

more than 500,000 mines that Iraq reportedly laid in Kuwait.<sup>149</sup> In less than a year following the war, explosive ordnance reportedly killed or wounded 1250 civilians and killed fifty explosive demolition specialists.<sup>150</sup>

Depleted uranium (DU) was also used in the Gulf War. Some 14,000 DU tank rounds were fired and an additional 940,254 DU rounds from A-10 aircraft.<sup>151</sup> There is an on-going debate about the lingering environmental and health hazards caused by DU ammunition.<sup>152</sup> The United Nations Environment Programme (UNEP) scientific mission to Kosovo, reviewing the use of DU there, has recommended decontamination of "hot spots," education of the population regarding residual threats, and more scientific study into the still uncertain effects of DU as it persists in the environment.<sup>153</sup>

The allied Gulf War strategy was also preoccupied with the threat of Iraq's chemical weapons potential. Substantial effort was taken to identify and destroy chemical weapons at storage sites before they could become a threat. Exposure to both DU and chemical agent residues have been widely, but not at all definitively, discussed and debated as potential causes of "Gulf War syndrome."<sup>154</sup>

Not all targets in the Gulf War or in Kosovo were as militarily oriented as tanks or chemical munitions. Since much of modern warfare relies on computers and communication, the electricity that runs the computers has become as essential a military commodity as petroleum and ball bearings were during World War II. The Gulf War commenced with weapons specifically

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claimed a 2-3% rate, observations indicate as high as a 30% rate. *Id.* at 126. *See also* Bruch & Austin, *supra* note 43.

149. Roberts, *supra* note 37, at 253.

150. *Id.* at 255.

151. Arkin, *supra* note 22, at 128. *See also* UNEP Scientific Mission to Kosovo, *supra* note 24.

152. *See generally* UNEP Scientific Mission to Kosovo, *supra* note 24.

153. *Id.* UNEP Press Release, *United Nations Environment Programme recommends precautionary action regarding depleted uranium in Kosovo* (Mar. 13, 2001), available at <http://www.unep.ch/balkans/press/press010313.html> (last visited Apr. 13, 2001). The release and underlying report note that the residue material that was found contains trace residues of Plutonium 239/240. The greatest risk comes from ingestion of the residue material.

154. This joins the discussion of "agent orange" as the potential cause of Vietnam War Syndrome. In fact, Agent Orange was a mixture of two common herbicides, 2,4-D and 2,4,5-T (Silvex). These same ingredients were used in the commercial garden herbicides that were sold in hardware stores during the period. Most of the focus during the search for the cause of the Vietnam War Syndrome was on why it could be caused by Agent Orange, as opposed to a searching inquiry of what may have caused the ailment. As a personal opinion this was a great tragedy, because we still have no idea what caused these ailments and the way we have gone about it makes it unlikely the cause will be found. In reality, soldiers in combat are immersed in a chemical cocktail of immunizations, food preservatives, explosive by-products of munitions, sterilizing agents to deal with close quarters, pesticides at base camps and on uniforms, and more recently chemicals to reduce infra-red emissions. This author knows of no effort to test these substances for their synergetic effects, nor on the long-term threats they may pose to human health or the environment.



designed to interfere with the generation and distribution of electricity.<sup>155</sup> The targeting of electrical systems was purposeful and the end result was that "all electrically operated installations . . . ceased to function."<sup>156</sup> The purpose of targeting electricity in modern combat has several aspects. Col. John Warden, one of the architects of the air campaign, stated:

Without electrical power, production of civil and military goods, distribution of food and other essentials, civil and military communications and life in general becomes difficult to impossible. Unless the stakes in the war are very high, most states will make desired concessions when their power generation system is put under sufficient pressure or actually destroyed.<sup>157</sup>

Since World War II, American military doctrine has designated the means of electrical production and distribution as an important target.<sup>158</sup> What was not apparent during World War II, and really did not become generally apparent until the Gulf War and Kosovo conflict, is the ancillary damage potential from concerted actions to deny an adversary electricity.<sup>159</sup>

Iraq, and to a larger extent the former Yugoslavia, are modern industrial states.<sup>160</sup> They both have large urban areas with dense populations made possible by modern technology for hygiene and sanitation. Those technologies—water and wastewater primarily—are highly dependent on electricity. So too are the amenities of urban living: light, transportation, health care, etc. Large urban areas normally have little capacity for standby

155. Arkin, *supra* note 22, at 122, 130.

156. Roberts, *supra* note 37, at 252.

157. Arkin, *supra* note 22, at 131. Targets like electricity are at the heart of military doctrine for proponents of strategic air power. The doctrinal concept is that there are certain elements of an enemy's structure and society and/or military capability that are so dear—in the terms of nineteenth century military strategist Von Clausewitz, "the center of gravity"—so that if they can be put at risk by long-range air power, the political forces of the enemy will capitulate without the necessity for a ground war. These concepts were developed by the Army Air Corps prior to World War II and were at the root of the attacks on Germany's oil and ball bearing resources. They were a subject of study when I was a student at the Air War College in 1985-86. The concept is not without intellectual merit from a humanitarian or environmental perspective. If this can be done, it should result in minimal casualties and without the devastation of a ground war. As with most great theories, the problem is with the details. What are the targets that constitute a "center of gravity," and how can they be held at risk without excessive collateral damage of human suffering and environmental despoliation? The 1999 Kosovo conflict will likely be argued and studied by military theorists for decades about what it teaches to strategic air power doctrine. See David M. Deptula (Brig. Gen., USAF), *Firing for Effects*, AIR FORCE MAG., Apr. 2001, at 46 (providing a discussion of modern air warfare strategy).

158. Arkin, *supra* note 22, at 122. The United States steadfastly resisted inclusion of power grids as prohibited targets during negotiation of the Additional Protocols. *Id.* at 124.

159. *Id.* at 124; Roberts, *supra* note 37, at 251.

160. UNEP, *The Kosovo Conflict—Consequences for the Environment and Human Settlement*, Ch.4, at <http://www.unep.ch/balkans> (last visited Apr. 13, 2001) [hereinafter UNEP Study].

power, as is readily apparent in the United States from the continuing media coverage of California's recent power blackouts. The denial of power not only directly damages health and hygiene, but as was seen in Kosovo, exacerbates that problem by creating large number of refugees, many of whom found themselves in overcrowded refugee camps.<sup>161</sup>

Denial of electrical power in a highly industrialized state may have other consequences. Earlier in this Article, environmental damages from the bombing of industrial facilities in the Yugoslavian town of Pancevo were discussed.<sup>162</sup> Certainly direct bombardment of industrial facilities can have direct and adverse environmental and human health consequences, but denial of electricity to industrial facilities can also have other, more insidious consequences. What occurred in the mining and industrial town of Bor is a perfect example. The cessation of electricity interrupted the production of sulphuric acid, which is a by-product of the copper industry.<sup>163</sup> Normally the gas is recovered, but after the attack the Balkans Task Force Inspection Team could smell the gas "several kilometers" from the plant.<sup>164</sup> It is not clear from the report how much gas was released by the attack and the cessation of electrical power.

The incident at Bor highlights another consequence from military strategies involving denial of electricity. Modern industrial facilities rely on electricity for process controls. All the horrible scenarios that flew about as the world prepared for the Y2K computer crisis are just as possible in the event of major interruptions of electrical power. While many facilities have backup power supplies, they are not designed for long interruptions of power. Also, many of these electrical backup systems rely on petroleum-based fuels. These will likely be in short supply during a war, and cutting electricity greatly complicates the process of pumping and delivering fuel to end users.

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161. *Id.* at 4. Regarding Pancevo, "[m]uch of the Town's population was said to have been temporarily evacuated following the [air] strikes of 17/18 April." *Id.* at 32.

162. See *supra* notes 25-26 and accompanying text. In the UNEP Study, *supra* note 160, the UNEP Balkans Task Force found four cities bombed during the conflict that remain as potential hot spots of environmental contamination: Pancevo; Kragujevac, *id.* at 38 (leaking and burning PCBs—creating dioxin—from bombing the Zastava car plant); Novi Sad, *id.* at 42 (risk of ground water contamination from petrochemicals released during bombing of an oil refinery); and Bor, *id.* at 49 (PCB releases and cessation of electrical power which caused interruption in production of sulphuric acid, which created a large release of sulphur dioxide gas; however, the team believed that sulfur dioxide releases may have been chronic before the conflict). It should be noted that the environment around the four "hot spot" cities was far from pristine before the conflict. The Task Force noted that a contributing factor for the contamination at Novi Sad was that drinking water wells were located too close to the refinery in the first place. *Id.* at 43.

163. *Id.* at 49.

164. *Id.*

Under the Law of War, however, there is no per se prohibition on destroying industrial targets. Rather, the principles balance consequential damage against military necessity, but again these balancing decisions in the first instance are made in the heat of battle by military commanders with military objectives.<sup>165</sup>

## V. ENFORCEMENT

Even assuming that there is a useful framework in international law and particularly the Law of War that would protect the environment, such protections are meaningless without a mechanism for enforcement. By and large there is none. While there were allegations of environmental war crimes in the Gulf War, there have been no enforcement tribunals in a Nuremberg sense.<sup>166</sup>

One problem is the vagueness of the provisions. Various steps were taken to review the Law of War following the Gulf War to determine whether it was adequate to protect the environment, or whether additional Law of War conventions were required.<sup>167</sup> The ICRC issued a set of guidelines, but they rely heavily on Protocol I which has yet to be adopted by many states, including the United States.<sup>168</sup> In sum, there appears to be no rush by nations to develop more concrete standards for enforcing environmental protection during war.

The International Criminal Tribunal of the Former Yugoslavia was created by the U.N. in 1993 to try serious violations of international humanitarian law.<sup>169</sup> To date, no criminal tribunals have involved breaches related to environmental damage.<sup>170</sup> At the onset of the Kosovo conflict, Yugoslavia brought a broad-based action before the International Court of

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165. See *supra* notes 46-64, 70-72 and accompanying text.

166. Roberts, *supra* note 37, at 256. However, a process for reparations was created.

167. See generally ENVIRONMENTAL PROTECTION AND THE LAW OF WAR, *supra* note 43. This book is in essence a report on a conference to determine the need for a fifth Geneva Convention that would protect the environment. PROTECTION OF THE ENVIRONMENT, *supra* note 3, is a similar volume on a 1995 Naval War Conference on the Law of War and the Environment. The Environmental Law Institute held a similar conference in 1998.

168. Roberts, *supra* note 37, at 258. The Guidelines appear as Appendix A in PROTECTION OF THE ENVIRONMENT, *supra* note 3.

169. Nicholas Alexander, *Air Strikes and Environmental Damage: Can the United States be held Liable for Operation Allied Force?* 11 COLO. J. INT'L ENVTL. L. & POL'Y 471, 486 (2000).

170. *Id.* at 487. See also International Criminal Tribunal for the former Yugoslavia, at <http://www.un.org/icty> (last visited Apr. 12, 2001). Alexander notes that two complaints had been delivered to the Tribunal asserting that NATO leaders should be brought before the Tribunal for humanitarian violations related to Operation Allied Force. They also included alleged environmental violations due to the 78-day bombing campaign. Alexander, *supra* note 169, at 487.

Justice (I.C.J.) seeking to enjoin the conflict,<sup>171</sup> but ultimately the I.C.J. dismissed the action determining that it lacked jurisdiction.<sup>172</sup>

There have been suggestions that the new International Criminal Court may be a forum for prosecuting "environmental war crimes."<sup>173</sup> The Rome Statute upon which the court is based includes a category of environmental war crimes, but it sets either a high threshold for the crime or incorporates a military necessity balancing test.<sup>174</sup> Consequently, there are several procedural requirements that make the court an unlikely forum for any new broad initiative to prosecute environmental Law of War violations or other environmental war crimes.<sup>175</sup>

The creation of the UNEP Balkans Task Force was one useful development from the war in Kosovo. The Task Force has begun an authoritative study into the environmental consequences of war.<sup>176</sup> This has two potential benefits. First, it may at last bring some objective, neutral environmental science to the debate about the nature of environmental impacts caused by war and particularly how they may be caused. Second, it may set a precedent for a neutral objective body that can observe and issue critical assessments about the conduct of war and its potential environmental consequences, albeit only in a post-conflict context.

## VI. PATHS FOR FUTURE CONSIDERATION IN THE ENVIRONMENTAL LAW OF WAR DILEMMA

The issue of destruction due to war is replete with moral dilemmas. Those are not, however, the focus of this Article.<sup>177</sup> Instead, the focus is on war and the strengths and weaknesses of the current protective legal regimens of the Law of War. Having discussed the weaknesses, it is time to turn to potential improvements. There are both legal and pragmatic paths that might be followed to lessen the impact of armed conflict on the environment.

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171. Bruch & Austin, *supra* note 43, at 10,072. I.C.J. materials for this matter are available at <http://www.icj-cij.org/icjwww/publications/icalogue/> (last visited Apr. 12, 2001).

172. Bruch & Austin, *supra* note 43, at 10,072.

173. Drumbl, *supra* note 28, at 124.

174. *Id.* at 125

175. *Id.*

176. See UNEP Press Release, *supra* note 153; UNEP Study, *supra* note 160.

177. For example, omitted from discussion in this Article is the fundamental issue of whether a war is "just" in the first place under international law.

### A. Legal Paths

Legal paths include the continuation of debate on the environmental impacts of war. This Symposium, with its related *Vermont Law Review* Symposium Edition, and the Balkans Task Force are both positive steps in that direction. There also appears to be a growing connection between the consequences of environmental impact of war and the more traditional values of humanitarianism in the Law of War.

Only recently has humankind become sensitive to the more insidious impacts of pollution to ecosystems and human health. The Laws of War that we have reviewed treat the environment as an ephemeral concept largely unrelated to the human condition. Through recent research done on biological risks posed by environmental hazards, we are only now becoming aware that the condition of man and the environment are linked. The long-term impact of pollution caused by military activities is only now coming into focus.

There are lessons to be learned from the biological and ecological risk assessments that accompany the cleanup of military bases in the United States. Things long taken for granted, such as that chemical by-products of munitions are largely benign, are being challenged. The U.S. Environmental Protection Agency has halted the burning of munitions at the Massachusetts Military Reservation on Cape Cod due to ground water contamination.<sup>178</sup> While the hydrology of Cape Cod where the Reservation is located is somewhat unique, the materials that are being burned there are the same, or are similar to those being used all over the world.

The Balkans Task Force is another step forward to understanding the impacts of war on the environment. It will hopefully continue to focus scientifically on those activities which may cause the greatest environmental problems. This information will give the policymakers more substantial information to craft future Law of War protections.

It is debatable whether adopting new Law of War conventions or particularizing the criteria for the existing ones is a better approach. This author believes that debate continues in part because of the sparsity of information about war's environmental effects. There is simply no adequate body of objective scientific information to put to rest the issue of what harm is being caused and how. Efforts like the Balkans Task Force provide better data as to potential consequences that before were only discussed and debated through anecdote and inference.<sup>179</sup>

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178. Scott Allen, *EPA Orders Cease Fire on Cape Base*, BOSTON GLOBE, May 18, 1997, at A1.

179. This is not to assume that studies will result in conclusions that will receive unanimous acceptance in the world community any more than have studies about global warming. However, they should focus the debate. This should help form the discussion on the main concerns of this author, which

Such information is particularly important if the military necessity balancing tests in the current Law of War regimens are to have any validity. The debate today too often sounds like the debate in the early days of the United States' hazardous waste management statute, the Resource Conservation and Recovery Act,<sup>180</sup> when long-time plant managers would say "we aren't doing any harm, we've always dumped the waste on the back forty." Ignorance can be bliss for them, and so too can it be for the military commander faced with the challenge of securing a military objective. If there is no information in his or her consciousness about the potential environmental effects of his or her action, how can he or she be expected to validly use a military necessity balancing test? If one side of the balance is always perceived as zero, the scale will always tip in the other direction—military necessity.

### *B. Pragmatic Paths*

In the near term there are many pragmatic paths that would help put armed conflict and environmental protection in better balance. One is to expand the charter of UNEP and the Balkans Task Force. The preface to the UNEP report notes the Task Force work was in addition to and beyond other existing UNEP programs. What is needed is an organization that can evaluate the environmental effects of all types of conflicts all over the world, just as the ICRC monitors and evaluates humanitarian concerns. UNEP, having taken the initial step, may be a logical candidate to fill that role. It may be particularly appropriate when the armed conflict involves U.N. peacekeeping.

Traditionally U.N. peacekeeping invokes the type of conflict that can be particularly problematic for environmental protection, especially when one of the parties is in the form of a regular army that historically relies on massive firepower.<sup>181</sup> One or more nations providing forces to a U.N. peacekeeping mission normally falls into this category. One pragmatic step that would help clarify environmental protection in such situations would be the U.N. adoption of the ICRC guidelines for forces in U.N. peacekeeping missions. This would at least solve the problem of certain countries claiming they were not bound by Protocol I. It would be even better if the U.N. could develop supplemental guidance for field commanders in dealing with the vague military necessity balancing equations in a peacekeeping mission context.

A larger question, looking at Western nations and particularly the United States, is whether their regular armed forces are the right tool for modern

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are types of targets and residual effects of weapons.

180. 42 U.S.C. §§ 6901-6992 (1994).

181. See generally KALSHOVEN, *supra* note 44.

conflicts. There are two interrelated issues: the mind-set of the professional soldier, and the warrior's tools they are given to use. This is intended in no way to demean the men and women of the military. Arguably, there are no organizations better able to do what they are designed to do than the U.S. military and the military of its NATO and Asian rim partners. Throughout the cold war, these military forces were equipped by the Executive Branch's leadership and the Congress to encounter and defeat military forces that posed a threat to U.S. interests. But often in the past decade they have been asked to perform in ways that are at odds with what they are designed and trained to do.<sup>182</sup>

It takes a particular mind-set to be a professional combat soldier, sailor, or pilot. One part of that mind-set is confidence that anything can be done. This is very important when charging beaches with machine guns pointed at you or flying a bomb run over a heavily defended target. Another part of that mind-set is obedience to perform the mission. Military members are taught from basic training on that their task is not to choose the mission but to accomplish it. To accomplish that mission, military members are given tools—weapons—rarely of their own choosing, and trained repeatedly as to how to use them effectively. The goal is that using the tools becomes instinctive, as there is usually little time for quiet contemplation in the “fog and friction” of war.<sup>183</sup>

This training and mind-set can be a troubling combination when the military is called upon to perform outside its traditional mission of engaging enemy military forces that pose a threat to U.S., NATO, or world security interests. When asked to perform outside its normal mission areas, the instinctive feeling is that whatever is being asked can and will be accomplished. Neither is it in the normal military mind-set to question what is being asked. Restrictions must be described as part of the mission objective, or must become so obviously repugnant to the members' repeated training in the Law of War or other moral formulations that they are not considered “restrictions” at all. These are attitudes that are vitally important in successfully engaging in combat activities, but may not be well suited to limited combat or other non-armed conflict situations.

Complicating this equation are the tools that are provided to the average soldier, sailor, or pilot. The U.S. armed forces are using weapons today that

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182. To adapt, the Marine Corps has devised a specially designed martial arts program with an emphasis on concentration. Greg Jaffe, *A Few Good Men Try Martial Arts and Take on 2 Gurus*, WALL ST. J., Oct. 9, 2000, at A1. The Army has found military police often better suited to the peacekeeping task than traditional combat soldiers. Thomas E. Ricks, *U.S. Military Police Embrace Kosovo Role; Mission of Stability is a Good Fit for Peacekeeping Tasks in Volatile Region*, WASH. POST, Mar. 25, 2001, at A21.

183. See generally CARL VON CLAUSWITZ, *ON WAR* (Princeton University Press 1984).

by and large were products of the cold war mentality of a life or death struggle with Warsaw Pact forces greatly superior in number. Today's ships, planes, vehicles, and weapons were almost all designed to defeat a large, sophisticated cold war adversary. These are the same tools that a modern Western military must use in conducting military operations other than war. The problem is best summed up in the adage "when your only tool is a hammer, every problem is a nail." Military forces, simply stated, have been equipped and trained for war not peace. When they are asked to perform a military operation other than war, the tendency is to bring the warrior mindset and a warrior's equipment to the task. It is like asking a SWAT team to do community policing.<sup>184</sup>

It is true that some of the modern arms, such as precision munitions, offer the possibility of less collateral damage, because it has a better chance of obliterating only the intended target, rather than the things around it. But the target is still obliterated and in cases like electrical power generation or a chemical plant, the effect of total obliteration may be sizeable ancillary damage to civil society. Use of these weapons also presupposes the technology works<sup>185</sup> and that the intelligence community and military have chosen the right target and not an embassy.<sup>186</sup>

One solution may be better environmental impact analysis. Time will tell whether the new U.S. Department of Defense regulations on Major Weapons System Acquisition<sup>187</sup> will require environmental analysis that also incorporates the concerns of Protocol I, Article 36 for weapons reviews that include their potential for widespread, long-term, and severe environmental damage.<sup>188</sup>

Another positive sign is the approach taken by the U.S. Army in the waning days of the Clinton Administration to embark on a Strategic Environmental Assessment that would capture and evaluate the environmental applications of the Army's proposed conversion to a more mobile force to

184. In making this point, I am mindful of the importance of recognizing that too often in today's ugly little wars, all sides have access to modern weaponry for sale in the world's arms bazaars that would have made a World War II army jealous: AK 47 automatic weapons for personal arms, heavy machine guns, recoilless rifles, and military rockets. What is often seen as equipment for South American, mid-Eastern, or African low intensity combat, today would have been on a D-Day Commander's wish list.

185. In an early 2001 strike in Iraq, twenty-six of thirty new smart weapons were thrown off target by wind. Two more did not even make it to the target area. Officials said the problem could be fixed with a software change. Robert Wall & David Fulghum, *Altering Sanctions May Benefit Iraq's Rearming*, AVIATION WK. & SPACE TECH., Mar. 5, 2001, at 41.

186. Rowan Scarborough, *As Strikes Mount, so do Errors*, WASH. TIMES, May 11, 1999 at A1, available at 1999 WL 3084903.

187. DEPARTMENT OF DEFENSE DIRECTIVE 5000.1 (Oct. 23, 2000); DEPARTMENT OF DEFENSE INSTRUCTION 5000.2 (Oct. 23, 2000).

188. Protocol I, *supra* note 46 and accompanying text.



allow more rapid deployment.<sup>189</sup> Lastly, there is the possibility of retooling the applicability of Executive Order 12,114 requirements that seek to apply a NEPA-like process overseas. Unfortunately, combat activities are exempt.<sup>190</sup>

These approaches are based on the assumption that a regular military force is the right organization to undertake such a mission. For the reasons previously cited—mind-set, tools, and training—this may not be the right answer. What makes military forces the obvious candidate to civilian decision-makers for such a role is their comparative ability to rapidly deploy anywhere around the world. It does not logically follow that once there, they are the right choice to perform peacekeeping and other non-war-fighting operations. This may be the time as the roles, missions, and budget of the Defense Department are undergoing a substantial rethinking under the new Bush Administration to address whether non-war operations belong in some other specially trained and equipped entity, in the same spirit that *posse comitatus* has long barred military forces from domestic policing functions in the United States.<sup>191</sup>

What perhaps is needed is an organization more akin to community policing and less to the “SWAT” team—one that could be trained and equipped for peacekeeping and other-than-war operations and be a proponent for less destructive methods in internal government debates about alternative strategies.<sup>192</sup>

Military assets could still use their logistics to deploy and, if necessary, sustain the peace keepers. They could also be available if there was a need for substantial military force. Other than that, however, the operation would be a civilian operation—a Peace Corps with a night stick, not a cluster bomb—that would be focused on preserving and sustaining civil society—peacekeepers at heart, not warriors.

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189. Conversation with Ray Clarke, former Principal Deputy to the Secretary of the Army for Installation and Logistics (Dec. 2000).

190. Exec. Order No. 12,114, 44 Fed. Reg. 1959 (Jan. 4, 1979), was implemented by Department of Defense Directive 6050.7, Environmental Effects Abroad of Major Department of Defense Actions. See DEPARTMENT OF DEFENSE DIRECTIVE 6050.7 (Mar. 31, 1979). See also Fair, *supra* note 127, at 117-18. (discussing the applicability of the order to military operations other than war). Notwithstanding that there is no requirement for environmental impact analysis in combat, during the air wars for the Gulf and Kosovo, military lawyers were assigned to review proposed targets for Law of War compliance.

191. David Bond, *Bush Team Rethinking Military Strategy*, AVIATION WK. & SPACE TECH., Mar. 12, 2001, at 60. Notably absent in the news reports about this rethinking of military strategy is a focus on military operations other than war.

192. “Commanders of the multinational force here [Kosovo] increasingly agree that police skills are what Kosovo needs. One reason is that MPs tend to be more comfortable with a mission in which the goal isn’t victory but stability.” Ricks, *supra* note 182, at A21.

