

THE RELATIONSHIP BETWEEN THE INTERNATIONAL LAWS OF ARMED CONFLICT AND ENVIRONMENTAL PROTECTION: THE NEED TO REEVALUATE WHAT TYPES OF CONDUCT ARE PERMISSIBLE DURING HOSTILITIES

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INTRODUCTION

Developing through treaty and custom, two important bodies of law have evolved on the international scene: the International Law of Environmental Protection (LEP), and the International Law of Armed Conflict (LOAC).¹ LEP has developed primarily during the twentieth century. LOAC, though it has been developing for many centuries, has recently developed aspects similar to LEP. Specifically, today there exist within LOAC limitations on environmentally disruptive activities during armed conflict. Some of these limitations are clearly rooted in what can be called environmental considerations, or an environmental ethic.

The premise of this Article is that this environmental ethic that exists in both LEP and, to a limited extent, LOAC, is not a coincidence. It is instead indicative of a common value system that these two legal regimes share. Further, due to this shared ethics system LEP can be used to interpret various passages of LOAC that relate to limiting environmental damage during armed conflict, and prohibiting the manipulation of the environment for hostile purposes.

To support this thesis, the development of an International Law of Environmental Protection will be established, and the environmental protection aspects of LOAC will be analyzed. The philo-

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† The views in this Article are those of the author and do not reflect the official policy or position of the United States Air Force, Department of Defense, or the United States government.

1. LOAC is also referred to as the Law of War or the Humanitarian Law of Coercion Control. In this Article the acronym LOAC will be used.

sophical underpinnings and relationship between LOAC and LEP will then be explored. Finally, the practical relationship between LOAC and LEP will be presented.

Three points need to be made by way of introduction. First, it is clear that the nature of war is to destroy life and property, and this will never change.² However, as will be explored, LOAC limits the means of destruction by requiring combatants to consider the environmental impact of their actions. Second, the issue of nuclear warfare and environmental protection has been purposely avoided. If there ever is a nuclear war, the environmental damage would be so devastating that humans and their environment would likely be eliminated. Such a result would make analysis of environmental armed conflict issues, before or after the use of such weapons, meaningless.³

Third, attacking the environment as a means of waging war is not a new concept. There is a long list of wars in which protagonists have attempted to destroy the enemy by attacking the environment.⁴ Also, harnessing the powers of nature to manipulate the environment as a means of waging war is not as fanciful as it may sound. Section II of this Article details some of the methods used by the United States during the Vietnam War to achieve this end.⁵

Environmental assaults have had a long history. Today, due to our increased technological ability to cause environmental damage,

2. Mallison, *The Laws of War and the Juridical Control of Weapons of Mass Destruction in General and Limited Wars*, 36 GEO. WASH. L. REV. 308, 309 (1967).

3. The catastrophic damage that would flow from such a nuclear exchange is dubbed "nuclear winter." Train, *A Perspective on World Environmental Problems*, EPA J. 2, 3 (Jan.-Feb. 1985). The U.S. Department of Defense has studied this issue and has concluded that nuclear winter is possible and merits further study. U.S. DEPARTMENT OF DEFENSE, *THE POTENTIAL EFFECTS OF NUCLEAR WAR ON THE CLIMATE: A REPORT TO THE U.S. CONGRESS* (1985).

4. STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE, *WARFARE IN A FRAGILE WORLD: MILITARY IMPACT ON THE HUMAN ENVIRONMENT 15-19* (1980) [hereinafter SIPRI]. For example, in 455 the Vandals accomplished the sacking of Rome by pillaging and destroying the city. During the Thirty Years' War of 1618-1648 in central Europe, the German states were severely ravaged, and they lost forty percent of their population. In 1812, during the Napoleonic Wars, the Russians practiced a self-inflicted scorched earth policy, which did not prevent the destruction of Moscow by the French in September 1812. The Chinese used scorched earth tactics during the Tai Ping Rebellion of 1850-1864 to crush the rebels. Approximately twenty to forty million people died. Chemical warfare agents were used on a large scale in World War I. World War II ended in the loss of fifty million people, including the systematic extermination of Jews and Gypsies. High explosive devices were widely used to bomb densely populated areas. And the nuclear destruction of Hiroshima and Nagasaki caused the devastation of enumerable ecosystems. *Id.* Finally, during the Vietnam War the United States employed bombing and chemical techniques that resulted in a massive disruption of the natural and human ecologies. *Id.*; see also *infra* note 106.

5. STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE, *ECOLOGICAL CONSEQUENCES OF THE SECOND INDOCHINA WAR 55* (1976) [hereinafter SIPRI].

the need to understand the international laws that control these methods of warfare is greater than ever.

I. THE INTERNATIONAL LAW OF ENVIRONMENTAL PROTECTION

There are two primary sources of international law: conventions and customs. Conventional international law consists of multilateral and bilateral treaties that set out in detail the responsibilities of the signing parties. Customary international law is more difficult to define. It is said to be "international custom, as evidence of a general practice accepted as law."⁶ It consists of two elements: an empirical element, or general practice among nations; and a psychological element, or *opinio juris*, which shows that these nations have accepted this general practice as international law.⁷ Both of these elements can be established by treaties themselves. When this happens, the customary law created can be binding even on nonsignatories.⁸ More frequently, however, the empirical and psychological elements are established by State declarations, proclamations, programs, and activities.⁹

A. Conventional International Law of Environmental Protection

One of the first treaties to deal with environmental protection on an international scale was the Antarctic Treaty of 1959.¹⁰ It prohibits nuclear wastes and explosions, and military fortifications and maneuvers from the Antarctic. It also designates the Antarctic as a place for scientific research, to be used only for peaceful purposes.¹¹

The 1963 Test Ban Treaty also strongly values environmental protection, banning all nuclear weapons testing in outer space, the earth's atmosphere, and underwater.¹² One of the goals of the

6. Statute of the International Court of Justice, as annexed to the Charter of the United Nations, June 26, 1945, 59 Stat. 1031, T.S. No. 993, art. 38(1)b.

7. M. VILLIGER, CUSTOMARY INTERNATIONAL LAW AND TREATIES 25 (1985).

8. North Sea Continental Shelf (W. Ger. v. Den. & Neth.), 1969 I.C.J. 12, at § 71 (Judgment Feb. 20, 1969).

9. M. VILLIGER, *supra* note 7, at 28.

10. Antarctic Treaty, Dec. 1, 1959, 12 U.S.T. 794, T.I.A.S. No. 4780. Signed by 13 nations, including the United States and the Soviet Union, it views Antarctica as a *res communes* area, and seeks to protect its environment from encroachment. C. CHRISTOL, THE MODERN INTERNATIONAL LAW OF OUTER SPACE 286 (1982). *Res communes* refers to those things which are used and enjoyed by everyone, even in single parts, but can never be exclusively acquired as a whole. BLACK'S LAW DICTIONARY 1173 (5th ed. 1979).

11. Antarctic Treaty, *supra* note 10, at art. I, ¶ 1.

12. Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space, and Underwater, Aug. 5, 1963, 14 U.S.T. 1313, T.I.A.S. No. 5433, 480 U.N.T.S. 43. This treaty can be viewed as according *res communes* treatment to outer space, the atmosphere, and the

treaty is “to put an end to the contamination of man’s environment by radioactive substances.”¹³

The 1967 Outer Space Treaty further develops the concept of international environmental protection.¹⁴ Parties to the treaty agree to “pursue studies of outer space, including the moon and other celestial bodies, and conduct exploration of them so as to avoid their harmful contamination and . . . where necessary, . . . adopt appropriate measures for this purpose.”¹⁵

The 1969 International Convention on Civil Liability for Oil Pollution Damage creates a system of international liability for environmental damage caused by oil spills from bulk carriers.¹⁶ It stands for the proposition that the nations of the world cannot sully the oceans with impunity.

The 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter also protects the oceans.¹⁷ It seeks to control the amount and the character of wastes dumped into the oceans in order to minimize the likelihood of damage to human and marine life.¹⁸

In a completely different vein, the 1972 Convention for the Protection of the World’s Cultural and Natural Heritage gives international recognition to the need to protect unique aspects of the environment—both man-made and natural.¹⁹ The treaty calls for the protection and conservation of important cultural resources (e.g., the Colosseum in Rome), and special natural sites (e.g., “Old Faithful” in Yellowstone Park). One of the goals of this treaty is historic preservation, which is the transmission of the world’s cultural and scenic heritage to future generations.²⁰

Finally, the 1979 Moon Treaty reflects a state-of-the-art appreci-

oceans. Eighty-six nations have signed the treaty. Significantly, France and the People’s Republic of China have not signed it. However, due to their recent failure to conduct nuclear weapons tests, they may be acquiescing to the treaty.

13. *Id.* at preamble.

14. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, *opened for signature* Jan. 27, 1967, 18 U.S.T. 2410, T.I.A.S. No. 6347, 610 U.N.T.S. 205 [hereinafter OST]. One hundred and ten nations have bound themselves to this treaty.

15. *Id.* at art. IX.

16. International Convention on Civil Liability for Oil Pollution Damage, Nov. 29, 1969, 9 I.L.M. 45, 69 AM. J. INT’L L. 481.

17. Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, Dec. 29, 1972, 26 U.S.T. 2403, T.I.A.S. No. 8165.

18. *Id.*

19. Convention for the Protection of the World Cultural and Natural Heritage, Nov. 16, 1972, 27 U.S.T. 37, T.I.A.S. No. 8226, 11 I.L.M. 1358.

20. *Id.* at arts. 1, 2 & 4.

ation for environmental protection—even in a realm as admittedly hostile as outer space: “In exploring and using the moon, States parties shall take measures to prevent the disruption of the existing balance of its environment whether by introducing adverse changes in such environment, its harmful contamination through extra-terrestrial matter or otherwise.”²¹

B. Customary International Law of Environmental Protection

An analysis of the activities of the United Nations and other multilateral international organizations, the domestic practices of the United States and the Soviet Union, and the resolution of international environmental disputes will demonstrate that a consensus regarding environmental protection has emerged among States as reflected in their actions.

1. International Organizations

In 1972, the United Nations (U.N.) established the United Nations Environmental Programme (UNEP). It held a conference in Stockholm, and one hundred thirteen States adopted a Declaration containing twenty-six principles relating to the protection and enhancement of the world's environment.²²

21. *Agreement Governing the Activities of States on the Moon and Other Celestial Bodies*, Dec. 5, 1979, G.A. Res. 34/68, 34 U.N. GAOR Supp. (No. 46) at 77, U.N. Doc. A/Res/34/68, 18 I.L.M. 1434, at art. VII [hereinafter *Moon Treaty*]. Although the Moon Treaty is signed by only eleven nations, of which only the Netherlands and France are noteworthy, the treaty is worth citing for its cutting edge restatement of current world thinking on environmental matters, and the *res communes* nature of outer space. C. CHRISTOL, *supra* note 10, at 912.

22. *Stockholm Declaration of the United Nations Conference on the Human Environment*, June 16, 1972, U.N. Doc A/Conf. 48/14, 11 I.L.M. 1416.

Some of the more significant principles include:

Principle 6. The discharge of toxic substances or of other substances and the release of heat, in such quantities or concentrations as to exceed the capacity of the environment to render them harmless, must be halted in order to ensure that serious or irreversible damage is not inflicted upon ecosystems. The just struggle of the problems of all countries against pollution should be supported.

Principle 7. States shall take all possible steps to prevent pollution of the seas by substances that are liable to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the sea.

Principle 21. States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.

Principle 22. States shall cooperate to develop further the international law regarding liability and compensation for the victims of pollution and other environmental

These principles bolster the sea treaties analyzed above, by stressing the undesirability of dumping substances (hazardous and otherwise) that the environment cannot handle. The principles also view the oceans as *res communes*, and disapprove of pollution of the sea due to the harm it causes other legitimate users. They also create an affirmative duty on States to avoid causing environmental harm to other States, and call upon States to cooperate in the development of the international law of environmental protection by international and domestic means.

The results of the Stockholm conference were reported to the U.N. General Assembly, which approved the Declaration, and urged all States to reaffirm the commitments made in Stockholm.²³ On the same date, the General Assembly adopted a resolution making “institutional and financial arrangements for international environmental cooperation.”²⁴ As a result, UNEP gained greater stature. The executive director of UNEP was designated the head of a new environment secretariat, which functions “to serve as a focal point for environmental action and coordination within the United Nations system.”²⁵

The creation of UNEP and the Stockholm Declaration is recognized as humanity’s first major step towards acknowledging the international implications of environmental protection and the need to respond to pollution with cooperation on an international scale.²⁶ The next step came in 1974, when the U.N. General Assembly included an article on environmental protection in its resolution entitled the *Charter of Economic Rights and Duties of States*.²⁷ The

damage caused by activities within the jurisdiction or control of such States to areas beyond their jurisdiction.

Principle 24. International matters concerning the protection and improvement of the environment should be handled in a cooperative spirit by all countries, big and small, on an equal footing. Cooperation through multilateral or bilateral arrangements or other appropriate means is essential to effectively control, prevent, reduce and eliminate adverse environmental effects resulting from activities conducted in all spheres, in such a way that due account is taken of the sovereignty and interests of all States.

Principle 25. States shall ensure that international organizations play a coordinated, efficient and dynamic role for the protection and improvement of the environment.

23. *Approval of Stockholm Conference by the General Assembly*, 1972 U.N.Y.B. 330, G.A. Res. 2994. The vote was 112 for the treaty, none against, and 10 abstentions.

24. *Institutional and Financial Arrangements for International Environmental Cooperation*, G.A. Res. 2997, Dec. 15, 1972, 12 I.L.M. 433.

25. *Id.* at 435.

26. Strong, *Where Are We Growing?*, EPA J. 24 (Nov.-Dec. 1979). Over ninety nations are members of UNEP, and its yearly budget is over \$62 million (the majority of which comes from special voluntary financing from the members of UNEP). 1984 U.N.Y.B. 748.

27. *Charter of Economic Rights and Duties of States*, 1974 U.N.Y.B. 405, G.A. Res.

United Nations did not act again in the area of LEP until nearly a decade later, in the 1982 resolution entitled the *World Charter for Nature*.²⁸ This resolution calls upon all nations to respect nature and avoid impairing its essential processes; to not compromise the genetic viability of the earth's life forms (e.g., protect endangered species); to protect the habitats of all creatures great and small; to subject all areas of the earth to the principles of conservation; and to manage all ecosystems, organisms, and land, marine, and atmospheric resources to maintain optimum sustained productivity.

Finally, there is the work of the U.N.-affiliated International Law Commission (ILC). Established in 1947, the ILC's goal is the progressive development and codification of international law.²⁹ One of the topics it examined is the Law of Non-Navigational Uses of International Watercourses, involving the prevention of conflicts between States that share a single watercourse system.³⁰ In the area of environmental protection, the ILC believes it is a principle of international law that States should refrain from activities that may cause harm to the interests of other States in the use of such a watercourse, and that States have an obligation not to pollute such streams.³¹ Independent of the United Nations is the confederation of European nations known as the Organization for Economic Cooperation and Development (OECD). Of the many resolutions it has passed, three of significance to LEP are the Declaration on Environmental Policy,³² the Principles Concerning Transfrontier Pol-

3281. Article 30 states:

The protection, preservation and enhancement of the environment for the present and future generations is the responsibility of all States. All States shall endeavour to establish their own environmental and developmental policies in conformity with such responsibility. The environmental policies of all States should enhance and not adversely affect the present and future development potential of developing countries. All States have the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction. All States should cooperate in evolving international norms and regulations in the field of the environment.

This resolution was adopted by a vote of 120 in favor, 6 against, and 10 abstentions. The countries who voted against the resolution were Belgium, Denmark, West Germany, Luxembourg, Great Britain, and the United States. Those abstaining were Austria, Canada, France, Ireland, Israel, Italy, Japan, Netherlands, Norway, and Spain. *Id.* at 402.

28. *World Charter for Nature*, 1982 U.N.Y.B. 1023, G.A. Res. 37. This resolution was passed by a vote of 111 to 1 (with 18 abstentions)—the one holdout being the United States. *Id.* at 1023.

29. McCaffrey, *The Work of the International Law Commission Relating to the Environment*, 11 *ECOLOGY L.Q.* 189, 190 (1983). The work of the ILC is viewed with interest because it carries weight as a statement of general international law. *Id.* at 191.

30. *Id.* at 192.

31. *Id.* at 201, 205.

32. *OECD Declaration on Environmental Policy*, Organization for Economic Coopera-

lution,³³ and the Polluter Pays Principle.³⁴

Although these principles are intended to guide the conduct of only the limited group of nations who are members of the OECD, these nations are nonetheless also very influential members of the international community. These principles present a very logical approach to the problem of transfrontier pollution and can be viewed as empirical evidence of the norm against pollution—particularly transfrontier pollution.

2. Domestic Practice

In order to present further evidence of a general practice against polluting the environment, and establish a customary international LEP, this Article will briefly examine the domestic environmental protection activity of the world's most influential States.³⁵

tion and Development, Nov. 14, 1974, O.E.C.D. Doc. A (74) 47. "The protection and progressive improvement of the environment is a major objective of the OECD Member Countries."

33. *Recommendations on Principles Concerning Transfrontier Pollution*, Organization for Economic Cooperation and Development, Nov. 14, 1974, O.E.C.D. Doc. C (74) 224. The OECD recommends that: "[M]ember Countries [should] cooperate in developing international law applicable to transfrontier pollution. . . ." *Id.* at preamble, para. 4. "Countries should define a concerted long term policy for the protection and improvement of the environment in zones liable to be affected by transfrontier pollution. . . ." *Id.* at tit. B, para. 1. "In implementing this concerted policy, countries should among other things . . . draw up and maintain up to date lists of particularly dangerous substances regarding which efforts should be made to eliminate polluting discharges. . . ." *Id.* "[C]ountries should, individually and jointly, take all appropriate measures to prevent and control transfrontier pollution, and harmonize as far as possible their relevant policies. . . ." *Id.* at tit. B, para. 2. "[P]olluters causing transfrontier pollution should be subject to legal or statutory provisions no less severe than those which would apply for any equivalent pollution occurring within their country. . . ." *Id.* at tit. C, para. 4a. "[L]evels of transfrontier pollution entering into the zones liable to be affected by such pollution should not exceed those considered acceptable under comparable conditions and in comparable zones inside the country in which it originates. . . ." *Id.* at tit. C, para. 4b. "Prior to the initiation in a country of works or undertakings which might create a significant risk of transfrontier pollution, this country should provide early information to other countries which are or may be affected. . . ." *Id.* at tit. E, para. 6. "Countries should promptly warn other potentially affected countries of any situation which may cause any sudden increase in the level of pollution in areas outside the country of origin of the pollution, and take all appropriate steps to reduce the effects of any such sudden increases." *Id.* at tit. F, para. 9.

34. *Recommendation on the Implementation of the Polluter Pays Principle*, Organization for Economic Cooperation and Development, Nov. 14, 1974, O.E.C.D. Doc. C (74) 224. "The Polluter-Pays Principle constitutes for Member Countries a fundamental principle for allocating costs of pollution prevention and control measures. . . ." *Id.* at art. 1, para. 1. "[It] means that the polluter should bear the expenses of carrying out the measures . . . to ensure the environment is in an acceptable state. In other words, the cost of these measures should be reflected in the cost of goods and services which cause pollution in production and/or consumption. . . ." *Id.* at art. 1, para. 2. "[T]herefore that as a general rule [Member Countries] should not assist the polluter in bearing the costs of pollution control whether by means of subsidies, tax advantages, or other measures." *Id.* at art. III, para. 1.

35. The views of the nations that make up the OECD are a significant sign that these

a. The United States

The United States is one of the world leaders in the area of environmental protection. It is heavily regulated by a host of domestic laws that attempt to control pollution and protect the environment. Laws such as the CAA, NCA, FWPCA, SDWA, RCRA, CERCLA, TOSCA, and NEPA, attempt to maintain the purity of America's air, water, and soil, all with the goal of protecting human health and the environment.³⁶

The concern of the United States for the environment extends beyond its borders. All U.S. federal agencies are required to weigh the environmental impact of federal activities that will have significant effects on the environment outside the United States.³⁷ Also, the United States has demonstrated concern for historic preservation, enacting the National Historic Preservation Act of 1966,³⁸ and encouraging the activities of the National Trust for Historic Preservation, a private organization which as of 1986 listed about 45,000 properties in the United States on the National Register of Historic Places.³⁹

b. The Union of Soviet Socialist Republics

The Soviet Union possesses a keen desire to protect the environment and to clean it up. It has committed some of its best scientific

countries believe environmental pollution—particularly the transfrontier form—is offensive enough to be condemned. The European outcry over the fouling of the Rhine by a chemical plant fire in Switzerland, is the clearest signal of how these countries view the issue of environmental protection and how seriously they believe in these principles. See *Rhine River Polluted by Chemical Plant Fire*, 46 FACTS ON FILE No. 2399, Nov. 14, 1986, at 858.

36. CAA: Clean Air Act, 42 U.S.C. §§ 7401-7642 (1982).

NCA: Noise Control Act, 42 U.S.C. §§ 4901-4918 (1982).

FWPCA: Federal Water Pollution Control Act, 33 U.S.C. §§ 1251-1376 (1982).

SDWA: Safe Drinking Water Act, 42 U.S.C. § 300f-300j (1982).

RCRA: Resource Conservation and Recovery Act, 42 U.S.C. §§ 6901-6987 (1982).

CERCLA: Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§ 9601-9657 (1982).

TOSCA: Toxic Substances Control Act, 15 U.S.C. §§ 2601-2629 (1982).

NEPA: National Environmental Policy Act, 42 U.S.C. §§ 4321-4370 (1982).

37. Exec. Order No. 12,114, 44 Fed. Reg. 1957 (1979), reprinted in 42 U.S.C. § 4321, at 515 (1982).

38. National Historic Preservation Act, Pub. L. No. 89-665, 1966 U.S. CODE CONG. & ADMIN. NEWS 1082.

39. In addition, 11,000 properties have been determined eligible for listing and over four million properties have been included in state inventories. Once listed, these properties receive a certain degree of protection from mindless renovation and destruction by developers. Shull, *The National Register After 20 Years*, PRESERVATION NEWS S-8 (Supp. Oct. 1986).

talent and resources to the development of pollution control technology, and created some of the strictest environmental protection laws in the world.⁴⁰

The Soviet Union has also entered cooperative efforts with the West. In a 1972 bilateral agreement with the United States on cooperation in environmental protection, both parties agreed to cooperate to prevent pollution, develop a basis for controlling the impact of human activities on nature, and develop new technologies that do not pollute the environment.⁴¹

On the private level, the All-Russia Society for the Conservation of Nature, which has more than twenty million members, further proves the Soviet Union's interest in the environment.⁴² Historic preservation is also an active issue in the Soviet Union. This is seen in the recent trend of showing greater respect for the past and encouraging the restoration of historic monuments.⁴³

3. *International Environmental Disputes*

The resolution of international disputes can provide principles of international law. The four cases discussed below are cited for the international environmental law principles they establish.

a. *The Trail Smelter Case*⁴⁴

This case involved transfrontier air pollution from a Canadian smelting plant into the United States. The tribunal held Canada

40. *Soviets Grappling With Pollution*, EPA J. 28, 29 (Jan.-Feb. 1984). For example, the law entitled the Fundamentals of the Legislation of the USSR and Union Republics on Protection of Health states:

Managers of enterprises, institutions, design and construction organizations, and management boards of collective farms, must envisage and protect air, water bodies, underground waters and soil from pollution while planning, constructing, reconstructing and exploiting enterprises. In case they fail to perform their duties they bear the responsibility determined by the legislation of the USSR and the Union Republics.

Kolbasov, *Legal Protection of the Environment in the USSR*, 1 EARTH L.J. 51, 55 (1975).

41. Agreement on Cooperation in the Field of Environmental Protection, May 23, 1972, United States-USSR, 23 U.S.T. 845, T.I.A.S. No. 7345, at art. 2, *reprinted in* 1 INTERNATIONAL PROTECTION OF THE ENVIRONMENT: TREATIES AND RELATED DOCUMENTS 53 (B. Rüster & B. Simma eds. 1975). A Joint Committee on Cooperation in the Field of Environmental Protection was established to further these goals. *Id.* at art. 5.

42. See Kolbasov, *supra* note 40, at 63.

43. *Soviets Apply "Openness" to a Much Revised Past: Now It Can Be Told: Stalin Was Rude*, Washington Post, Jan. 23, 1987, at A-21, A-26; *The Fight to Save Old Moscow: Rubble Rousing Preservationists Find a Friend in Gorbachev*, Washington Post, Mar. 29, 1987, at C-5.

44. *Trail Smelter (Can. v. U.S.)*, Arbitral Tribunal Under the Convention of Apr. 15, 1935, 3 R. Int'l Arb. Awards 1905 (1949). This was an arbitration decision rendered in two

liable for damages, stating that “no state has a right to use or permit the use of its territory in such a manner as to cause injury to the territory of another or the persons or property therein when the case is of serious consequence and the injury is established by clear and convincing evidence.”⁴⁵

b. The *Corfu Channel* Case⁴⁶

This 1946 International Court of Justice (ICJ) case involved the laying of mines by Albania within its territorial waters, which caused damage to British vessels that came in contact with the mines. Albania had not announced the presence of the mines, and as a result the court found Albania at fault. The ICJ held that it “is every States’s obligation not to knowingly allow its territory to be used for acts contrary to the rights of other States.”⁴⁷

c. The *Lake Lanoux* Case⁴⁸

This decision involved a lake located in France that discharged into Spain via a river. The river began in France, and continued for twenty-five kilometers to Spain where it was used for irrigation and drinking water purposes. Although the tribunal upheld France’s plan to alter the flow of the river for a hydroelectric project, it noted in passing that “there exists a principle prohibiting the upstream State from changing the waters of a river in their natural condition to the serious injury of a downstream State.”⁴⁹

d. The *Cosmos 954* Case⁵⁰

This was a claim by Canada against the USSR for the expenses Canada incurred in searching for and cleaning up the debris of a Soviet satellite that made an uncontrolled reentry into the atmosphere in 1978. The debris included highly radioactive Uranium 235 particles from the satellite’s nuclear reactor. Canada’s claim was eventually settled for \$3,000,000 Canadian dollars. The settlement agreement, however, did not reflect exactly what the USSR

parts, in 1938 and 1941.

45. *Id.* at 1923.

46. *Corfu Channel* (U.K. v. Albania), 1949 I.C.J. 4, *reprinted in* M. McDUGAL & W. M. REISMAN, *INTERNATIONAL LAW IN CONTEMPORARY PERSPECTIVE* 524 (1981).

47. *Id.* at 525.

48. *Lake Lanoux* (Fr. v. Spain), *Arbitrated Decision* of Nov. 16, 1957, *reprinted in* 53 *AM. J. INT’L L.* 156 (1959). This was an arbitrated decision made in 1957.

49. *Id.* at 160.

50. Gorove, *Cosmos 954: Issues of Law and Policy*, 6 *J. SPACE L.* 137 (1978).

was paying for, and this is still a matter of debate. Nonetheless, the USSR's willingness to pay⁵¹ and its eventual voluntary payment of damages demonstrates the impropriety of pollution in general, particularly transboundary pollution.

4. Customary International Law Analysis

As noted above, conventional international law can give rise to customary law; and the empirical and psychological elements that make up customary law can be established by the same evidence. In the case of LEP, customary law is established by the activities of a large percentage of the world's States in promoting environmental protection, and dealing with pollution once it occurs. There exists, therefore, a definite body of international law in favor of protecting humanity's environment (natural and man-made), and in preventing pollution of this environment. Some of the basic principles of LEP will now be examined.

C. Analysis of the Law of Environmental Protection

An analysis of LEP involves listing the scientific considerations upon which LEP is grounded, and then examining the fundamental principles of LEP, which can be extracted from international practice.

The scientific environmental protection and pollution abatement premises that provide LEP's foundation are the following:

1. It is clear that the global ecosystem is indeed an interconnected world-wide system, any part of which is more or less sensitive to perturbations anywhere else in the system.⁵²

2. Although the global ecosystem has natural self-renewing qualities, the system is threatened by increasing numbers of humans, their rising expectations, and an increase in the amounts and types of pollution.⁵³

3. Society must seek a stable relationship between itself and the basic biological systems upon which society is dependent (i.e., the fisheries, forest, croplands, and grasslands which provide society's food and natural resources).⁵⁴

51. *Id.* at 138.

52. Strong, *Where Are We Growing?*, EPA J. 14, 24 (Nov.-Dec. 1979); SIPRI, *supra* note 4, at 7.

53. SIPRI, *supra* note 4, at 13.

54. Brown, *Redefining National Security*, EPA J. 15, 38-39 (June 1978); *Threats to Biological Systems, an Interview with Lester Brown, President of Worldwatch*, EPA J. 14,

4. Care for the human environment is a common responsibility and must be considered in all activities including industrial activities. All elements of society must take action to minimize known adverse impacts on the human environment.⁵⁵

5. There is value in protecting certain unique natural resources, and certain significant accomplishments of humanity, solely because of their scientific, aesthetic or inspirational value. In effect, humanity's spiritual survival is accorded value secondary to its physical survival.

The fundamental principles of LEP that can be extracted from the international practice in this area are as follows:

1. "The principles of international environmental law clearly affirm the responsibility of one nation to control pollution causing damage in another. Nations must consider the extraterritorial impacts of actions taken within their borders."⁵⁶

2. There exists a principle of good neighborliness (*bon voisinage*) that is not confined to relations between adjacent States. It requires a State to not allow its territory to be used for acts contrary to the rights of others.⁵⁷

3. "A country which fouls the air and water of neighboring nations that are downwind or downstream is committing ecological aggression."⁵⁸

4. "By general International Law a State having evidence of a contamination of its territory, including air space, territorial waters and contiguous zone, provoked by another State's activities . . . may ask reparations for the damage done by means of proper procedure."⁵⁹

5. By force of their general right of self-preservation, States may demand the immediate cessation of the contaminating activities of another State.⁶⁰ Measures to enforce this claim include the whole gamut of sanctions at the disposal of States. These may range from

17 (Nov.-Dec. 1979).

55. Anderson, *Does Industry Have a Global Environmental Conscience?*, EPA J. 8, 9 (Jan.-Feb. 1985).

56. Wetstone & Rosencranz, *Transboundary Air Pollution: The Search for an International Response*, 8 HARV. L. REV. 89, 120-21 (1984).

57. Krass-Ablass, *Protection of the Terrestrial Environment in Outer Space: A Principle of International Law*, in PROCEEDINGS OF THE FOURTEENTH COLLOQUIUM ON THE LAW OF OUTER SPACE 73 (M. Schwartz ed. 1972).

58. Green, *Thinking Globally at EPA*, EPA J. 4 (Jan.-Feb. 1985).

59. Poulantzas, *Legal Problems Arising Out of Environmental Protection of the Earth*, in PROCEEDINGS OF THE FOURTEENTH COLLOQUIUM ON THE LAW OF OUTER SPACE 75 (M. Schwartz ed. 1972).

60. *Id.*

measures taken in self-protection, to reprisals and economic sanctions.⁶¹

6. States do not have an unfettered right to contaminate the areas of humanity's environment which are viewed as *res communes* by the international community. Outer space, the oceans, the ocean floors, the Arctic and Antarctica can not be appropriated by any country or group of countries for the purpose of waste dumping.⁶²

7. The concept of *res nullius* is no longer a player on the international scene.⁶³ States can not, for example, view the air over their territory as *res nullius*. When air is used as a repository for pollution, nations must realize it has an inherent transportive quality. Ultimately, air, water, and even soil have the ability to transport pollution to another State's territory. Therefore States must consider the assimilative capacity of any medium into which pollution is dumped, and the transportive capability of the medium as well.

8. States must show special sensitivity to the natural and cultural heritages of all other States. Historic preservation of the world's natural and man-made legacies is necessary for the complete survival of the human species.⁶⁴

Having established the existence of LEP, portrayed the scientific considerations upon which it is founded, and extracted the fundamental principles which make up LEP, the environmental protection aspects of LOAC and the interplay between it and LEP can now be examined.

II. THE INTERNATIONAL LAW OF ARMED CONFLICT

Although much of the early treaty and customary LOAC can be characterized as environmentalist in quality, it was never intended as such by its drafters or creators. For example, treaties and customs limiting the use of poisons in war were established to avoid the unnecessary suffering of combatants, and not out of concern for

61. *Id.*

62. C. CHRISTOL, *supra* note 10, at 286.

63. *Id.* *Res nullius* is the principle that a thing that has no owner naturally belongs to the first finder. BLACK'S LAW DICTIONARY 1174 (5th ed. 1979).

64. However, there are some experts in the field who question the efforts of those who are trying to preserve much of what is around us. They suggest that the desire to preserve cultural and historical heritage is given free reign without much thought for the big picture. As Philip Johnson, the "Dean of American architects," put it in an interview by Historic Preservation magazine: "If you live in a place long enough you are violently for its preservation. You can preserve a doghouse if you are used to it. Preservationists are trying to save everything, but there is no criterion. . . . Sentiment overlaps architecture and history." Knight, *Philip Johnson Sounds Off*, HIST. PRESERVATION 34, 39 (Sept./Oct. 1986).

the residual effects of these poisons on the surrounding ecosystem. Nonetheless, due to humanity's increased sensitivity to environmental matters, there is now an additional reason for adhering to such rules.

A. *Conventional and Customary International Law*

This analysis is broken down into two parts: 1) limitations on the types of weapon or methods of warfare that can be used, and 2) limitations on the objects of these weapons and methods. The one exception is the discussion of Protocol I to the 1949 Geneva Conventions,⁶⁵ which merits its own separate analysis.

1. *Chemical Warfare*

The traditional, primary limitation on weapons is in the use of poisons. Hugo Grotius, in his seventeenth century study of the law of war, noted that this prohibition has existed "from old times."⁶⁶ Over the years the prohibition against poisons evolved to encompass the concept of chemical warfare. A good starting definition of chemical warfare is the "intentional employment of toxic gases, liquids, or solids to produce casualties."⁶⁷ The first international action to address this form of warfare was the 1899 Hague Declaration concerning asphyxiating gases. This declaration called upon State parties to abstain from using projectiles containing "asphyxiating or deleterious gases."⁶⁸ The Hague Conventions on Land Warfare of 1899/1907 said that it was especially forbidden "to employ poison or poisoned weapons."⁶⁹ Despite these efforts, however,

65. Protocols Additional to the 1949 Geneva Conventions and Relating to the Protection of Victims of International Armed Conflicts (Protocol I), June 8, 1977, 1977 U.N. JURID. Y.B. 95, 16 I.L.M. 1391, *reprinted in* D. SCHINDLER & J. TOMAN, *THE LAWS OF ARMED CONFLICT: A COLLECTION OF CONVENTIONS, RESOLUTIONS, AND OTHER DOCUMENTS* 551 (1981) [hereinafter Protocol I]; *see also* U.S. DEP'T ARMY PAMPHLET 27-1-1 (Sept. 1979). Many of the provisions of Protocol I could be applied to these discussions on weapons, methods, and objects. However since Protocol I has yet to achieve universal acceptance, such an application will not be done and instead Protocol I will be discussed in a separate section.

66. H. GROTIUS, *DE JURE BELLI AC PACIS LIBRIS TRES* ch. 4, §§ 15-16, *reprinted in* 2 *CLASSICS OF INTERNATIONAL LAW* 651-53 (1964).

67. REPORT ON CBR (CHEMICAL, BIOLOGICAL, AND RADIOLOGICAL WARFARE), H.R. REP. NO. 815, 86th Cong., 1st Sess. 26 (1959).

68. Declaration Prohibiting the Use of Asphyxiating Gases (Hague Declaration II), July 29, 1899, 1907 Gr. Brit. T.S. No. 32 (Cmd. 3751), *reprinted in* D. SCHINDLER & J. TOMAN, *supra* note 65, at 100.

69. International Convention with Respect to the Laws and Customs of War by Land (Hague II), July 29, 1899, 32 Stat. 1803, T.S. No. 403; Convention Concerning the Laws and Customs of War on Land (Hague IV), Oct. 18, 1907, art. 23, 36 Stat. 2277, T.S. No. 539; *reprinted in* D. SCHINDLER & J. TOMAN, *supra* note 65, at 63 [hereinafter Hague Con-

chemical weapons were used in World War I. In response, the Geneva Gas Protocol was drafted.⁷⁰

In light of these treaties, and the almost universal adherence to the 1925 Geneva Gas Protocol since its creation, some experts contend there is a customary LOAC against the use of chemical weapons.⁷¹ Professor William O'Brien noted that the substantial non-use of chemical warfare in combat situations since World War I has created a customary law, binding on all States, which forbids the first use of such warfare.⁷²

The LOAC against the use of chemical weapons now has an environmental aspect to it. Basically the effects of chemical warfare are indiscriminate⁷³—after killing the intended combatant, many of these chemicals have a residual effect on the surrounding ecosystem.⁷⁴ The chemicals are persistent, mobile, capable of working their way up the food chain, and prone to concentrating in the tissues of the host organism.⁷⁵ This residual effect can manifest itself in the form of carcinogenic, teratogenic, and mutagenic effects on the life forms it comes in contact with.⁷⁶

The environmental impact of chemical warfare is particularly serious when it comes to the use of herbicides—chemical defoliants such as those used prevalently during the Vietnam War by the United States.⁷⁷ However, whether the conventional and customary

ventions on Land Warfare 1899/1907].

70. 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, T.I.A.S. No. 8061, 94 L.N.T.S. 65, *reprinted in* D. SCHINDLER & J. TOMAN, *supra* note 65, at 109 [hereinafter Geneva Protocol on Gases]; Mallison, *supra* note 2, at 325. The Protocol provides: "Whereas the use in war of asphyxiating, poisonous or other gases, and all analogous liquids, materials or devices has been justly condemned by the general opinion of the civilized world," the parties to the Gas Protocol agree to "accept this prohibition." Geneva Protocol on Gases, *supra*, at 110. The United States, Soviet Union and People's Republic of China have reserved the right to use chemical weapons against an enemy which fails to respect the Geneva Gas Protocol. *See* OST, *supra* note 14, at 6-1.

71. *See* Mallison, *supra* note 2, at 328.

72. O'Brien, *Biological/Chemical Warfare and the International Law of War*, 51 GA. L. REV. 32, 35 (1962). However States have always been prepared to defend against chemical assaults. For instance, in World War II the British manufactured and distributed gas masks in children's sizes for civil defense purposes. The mask was decorated with the image of Mickey Mouse—the feeling being that children might be more willing to carry and wear their masks if it carried such a decoration. Smith, *Exploring the Archives*, DISNEY CHANNEL MAG. 6 (Jan. 18, 1987).

73. *See* Mallison, *supra* note 2, at 324.

74. J. ROBINSON, THE EFFECTS OF WEAPONS ON ECOSYSTEMS 18 (1979).

75. *Id.*

76. WORLD HEALTH ORGANIZATION, HEALTH ASPECTS OF CHEMICAL AND BIOLOGICAL WEAPONS 14 (1970). Carcinogens are cancer-causing substances, teratogens are substances that harm fetuses, and mutagens are substances that cause mutations in embryos.

77. Johnstone, *Ecocide and the Geneva Protocol*, FOREIGN AFF. 714, 716 (July 1974);

laws against the use of chemical weapons reach to the issue of herbicides is somewhat questionable. The argument that LOAC does prohibit widespread herbicide use is now more convincing, using Protocol I to the 1949 Geneva Conventions.⁷⁸

2. Biological Warfare

With the advent of modern science came the possibility of using biological organisms to wage war. Biological warfare can be defined as the "military use of living organisms or their toxic products to cause death, disability, or damage to man, his domestic animals, or crops."⁷⁹

The first effort to prevent this form of warfare was the 1925 Geneva Gas Protocol in which the parties agreed to extend the same prohibition on the use of chemical weapons "to the use of bacteriological methods of warfare."⁸⁰ This treaty still allowed the development and stockpiling of bacteriological weapons—it prohibited only the first use of them.⁸¹ Under the 1972 Bacteriological Convention, however, this loophole was closed.⁸² As a result, it is now illegal as a matter of conventional LOAC to possess or engage in first use of bacteriological weapons. But there is as of yet no customary LOAC against bacteriological weapons.⁸³

The environmental benefit of banning biological warfare is best understood by the British experience with Gruinard Island. In 1942, the military potential of *bacillus anthracis* (the agent that

Westing, *Environmental Warfare*, 15 ENVTL. L. 645, 646 (1985); SIPRI, *supra* note 5, at 31-37; J.P. ROBINSON, *supra* note 74, at 18-19.

78. Although the United States ratified this treaty in 1975, Exec. Order No. 11850, 40 Fed. Reg. 16187 (1975), it reserved unto itself the right to use herbicides to control vegetation within military installations and around the immediate defensive perimeter, and the use of riot control chemical agents in defensive military modes to save lives (e.g., such as to control prisoner of war rioting). Johnstone, *supra* note 77, at 711; STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE, *THE LAW OF WAR AND DUBIOUS WEAPONS* 58 (1976) [hereinafter SIPRI]; U.S. DEP'T AIR FORCE, *Commander's Handbook on the Law of Armed Conflict*, U.S. AIR FORCE PAMPHLET 110-34, at 6-1 (1980).

79. Biological weapons include toxins—biologically created poisons which are not technically within the reach of the chemical warfare provisions cited above. See H.R. REP. No. 815, *supra* note 67, at 26.

80. See Geneva Protocol on Gases, *supra* note 70, at 110.

81. H. LEVINE, *THE CODE OF INTERNATIONAL ARMED CONFLICT* 1043 (1986). The treaty also permitted development and stockpiling of chemical weapons.

82. Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, Apr. 10, 1972, 26 U.S.T. 583, T.I.A.S. No. 8062. This convention specifically prohibits the development, production and stockpiling of bacteriological and toxin weapons. There is still no prohibition on the possession of chemical weapons. H. LEVIN, *supra* note 81, at 1043.

83. See Mallison, *supra* note 2, at 328.

causes anthrax) was tested at Gruinard Island. To this day the island is uninhabitable, primarily because the microorganism thrived when it was introduced and has become a permanent part of the ecosystem.⁸⁴ Fortunately biological weapons have never been used on a major scale in war.⁸⁵ If this form of warfare were ever completely unleashed, the environmental damage would be extensive. As with chemical weapons, the effect of biological weapons is indiscriminate.⁸⁶

3. Cultural and Historical Objects

Early in the development of LOAC, consideration was given to the protection of the property of noncombatants. Today, by convention and custom, it is a violation of LOAC to wantonly destroy such property.⁸⁷

Special protection for the cultural and historical objects of a State (private or public) was created early in the development of conventional LOAC. The Hague Conventions on Land Warfare of 1899/1907 require all necessary steps be taken during seizures and bombardments to protect cultural and historical landmarks and objects.⁸⁸ The 1907 Hague Convention Concerning Bombardment by Naval Forces in Time of War, and the 1922/1923 Hague Rules of Air Warfare also provide protection for cultural and historical objects.⁸⁹

84. Westing, *supra* note 77, at 656.

85. There have been allegations of their use from time to time. The Soviet Union has been accused of using biological weapons and toxins in Afghanistan. See J. ROBINSON, *supra* note 74, at 22; H. LEVINE, *supra* note 81, at 1043.

86. See Mallison, *supra* note 2, at 324.

87. U.S. DEP'T ARMY, *The Law of Land Warfare*, U.S. ARMY FIELD MANUAL 27-10, at 28 (1978); U.S. DEP'T AIR FORCE, *International Law—The Conduct of Armed Conflict and Air Operations*, U.S. AIR FORCE PAMPHLET 110-31, at 5-3(b) (1976); Convention For the Protection of War Victims Concerning the Protection of Civilian Persons in Time of War, Aug. 12, 1949, art. 30, 6 U.S.T. 3516, T.I.A.S. No. 3365, 75 U.N.T.S. 287, *reprinted in* D. SCHINDLER & J. TOMAN, *supra* note 65, at 427 [hereinafter Convention to Protect War Victims]. The wanton taking and destruction of property is called pillage or plunder—the forcible taking of private property by an invading or conquering army from the enemy's subjects. BLACK'S LAW DICTIONARY 1033 (5th ed. 1979).

88. Article 27 requires steps be taken “to spare, as far as possible, buildings dedicated to religion, art, science, or charitable purposes, historic monuments, hospitals, . . . provided they are not being used at the time for military purposes.” See Hague Conventions on Land Warfare 1899/1907, *supra* note 69, at art. 27. “[A]ll seizures of, destruction or willful damage to institutions of [religion, charity, education, the arts and sciences], historic monuments, works of art and science, is forbidden and should be made the subject of legal proceedings.” *Id.* at art. 56.

89. Convention Respecting Bombardments by Naval Forces in Time of War (Hague IX), Oct. 18, 1907, 36 Stat. 2351, T.S. No. 542, *reprinted in* D. SCHINDLER & J. TOMAN, *supra* note 65, at 723; Hague Rules of Air Warfare, Dec. 1922-Feb. 1923, *reprinted in* D.

Although limited in scope to the Western Hemisphere, the Roerich Pact of 1935 called upon belligerents to respect and protect the neutrality of historical monuments, museums, scientific, artistic, educational and cultural institutions, as well as the personnel of these institutions, in peace as well as in war.⁹⁰

The 1949 Geneva Convention (IV) prohibited the destruction of real or personal property, public or private, unless rendered absolutely necessary by military operations.⁹¹ Finally, the 1954 Hague Cultural Convention calls upon contracting parties to refrain from all acts of hostility against cultural property within their own territory as well as the territory of other contracting parties.⁹²

Cultural and historical property is also protected by customary law against pillaging. The trials of war criminals conducted after World War II provides proof of such a custom. First the Nüremberg Tribunal held that the LOAC principles in the Hague Conventions on Land Warfare of 1899/1907 had the force of customary law—binding even on nonsignatory States.⁹³ Second, the Principles of International Law Recognized in the Charter of the Nüremberg Tribunal make it a war crime to plunder public or pri-

SCHINDLER & J. TOMAN, *supra* note 65, at 147.

90. Protection of Artistic and Scientific Institutions and Historic Monuments (Roerich Pact), Apr. 15, 1935, 49 Stat. 3267, T.S. No. 899, art. 1, *reprinted in* D. SCHINDLER & J. TOMAN, *supra* note 65, at 723. The pact affects South and Central America, the Caribbean, and the United States.

91. Convention to Protect War Victims, *supra* note 87, at art. 53.

92. Convention for the Protection of Cultural Property in the Event of Armed Conflict and Protocol, May 14, 1954, art. 4.1, 249 U.N.T.S. 215, *reprinted in* D. SCHINDLER & J. TOMAN, *supra* note 65, at 661 [hereinafter Hague Convention on Cultural Property]. The Convention prohibits the theft, pillage or misappropriation of, and acts of vandalism or reprisal against cultural property. *Id.* at arts. 4.3-4.4.

Cultural property is defined as:

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 intrinsic, historical or archaeological interest; as well as scientific collections and important collections of books or archives or of reproductions of the property defined above.

Id. at art. 1.

The United States is not a party to this convention. However, the United States does recognize "that all cultural property, including that properly marked with the Hague emblem should be protected. . . ." *See* U.S. DEP'T AIR FORCE, *supra* note 78, at 3-5(b)(1). Further, the U.S. position is that reasonable measures should be taken to avoid damaging cultural objects, though they "may be attacked if the enemy uses them for military purposes." *Id.* at 3-5(a); *see also* B. JAKOVLJEVIC, *NEW INTERNATIONAL STATUS OF CIVIL DEFENSE: AS AN INSTRUMENT FOR STRENGTHENING THE PROTECTION OF HUMAN RIGHTS* 15-16 (1982).

93. U.N. WAR CRIMES COMM'N, *LAW REPORTS OF TRIALS OF WAR CRIMINALS* (1949); S. MALLISON & W. MALLISON, *ARMED CONFLICT IN LEBANON 1982: HUMANITARIAN LAW IN A REAL WORLD SETTING* 36-37 (1985).

vate property, wantonly destroy cities, towns or villages, or perform devastation not justified by military necessity.⁹⁴ Third, in some of the war crimes trials, the accused were convicted of crimes against cultural property.⁹⁵

By convention and custom, it is recognized that protecting the cultural and historical heritage of the world during times of war is important to the spiritual survival of humanity. It is a means of conserving the natural resources of the environment by avoiding the need to rebuild valuable real and personal property. The historic preservation ethic of LEP and the protection of cultural and historical resources of LOAC are identical.

4. *Genocide*

Within LEP is the concept that species of life forms that are threatened with extinction deserve protection as endangered species. With well over four billion human beings on the planet, it might be hard to imagine that humanity could ever be an endangered species. Nonetheless, LOAC protects human beings by prohibiting genocide—the systematic, planned annihilation of a national, ethnic, racial or religious group.⁹⁶

In terms of conventional LOAC, the Hague Conventions on Land Warfare of 1899/1907 prohibit the senseless destruction of human life.⁹⁷ In response to the selected killing of groups of people based on national, ethnic, racial, and religious identification in World War II, the Convention on the Prevention and Punishment of the Crime of Genocide was drafted in 1948.⁹⁸ The convention

94. Principles of International Law Recognized in the Charter of the Nüremberg Tribunal and in the Judgment of the Tribunal, adopted by the U.N. Int'l L. Comm'n (1950), principle VI(B), *reprinted in* D. SCHINDLER & J. TOMAN, *supra* note 65, at 835-36 [hereinafter Nüremberg Tribunal].

95. Dr. Joseph Buhler, for example, was convicted of confiscating libraries, laboratories, and art galleries belonging to the state of Poland, and art works belonging to private individuals in occupied Poland, and shipping them to Germany. U.N. WAR CRIMES COMM'N, *supra* note 93, at 29-39. Another example is the trial of Takashi Sakai, who among other things was convicted of pillaging valuable collections of books from libraries in occupied China. *Id.* at 1-7.

96. AMERICAN HERITAGE DICTIONARY OF THE ENGLISH LANGUAGE 550 (1975).

97. See Hague Conventions on Land Warfare 1899/1907, *supra* note 69, at art. 25. The Convention prohibits attacks on or bombardments of undefended towns, villages, dwellings or buildings. *Id.* at art. 25. It also requires belligerents to respect "Family Honour and rights, the lives of persons and private property, as well as religious convictions and practices." *Id.* at art. 46.

98. Convention on the Prevention and Punishment of the Crime of Genocide, Dec. 9, 1948, 78 U.N.T.S. 277, *reprinted in* D. SCHINDLER & J. TOMAN, *supra* note 65; see also S. MALLISON & W. MALLISON, *supra* note 93, at 73-74.

prohibits a variety of activities that could result in the destruction of national, ethnic, racial and religious groups.⁹⁹ In 1949, the Geneva Convention (IV) Relative to the Protection of Civilian Persons in Time of War, also drafted in response to the atrocities of World War II, reaffirmed the protected status of noncombatants.¹⁰⁰

There is a strong argument that due to the war crimes trials, the prohibition against genocide is also now a part of customary LOAC. As noted above, the Hague Conventions on Land Warfare were deemed customary law by the Nüremberg Tribunal.¹⁰¹ Several convictions of Axis personnel were based on genocide-type activities.¹⁰² Among the Principles of International Law Recognized by the Charter of the Nüremberg Tribunal were the customary international law offenses called crimes against humanity—"murder, extermination, deportation and other inhuman acts done against any civilian population or persecution on political, social or religious grounds."¹⁰³ Finally, the 1949 Geneva Convention (IV) has been signed by so many States that some writers suggest that it too has the force of customary international law.¹⁰⁴

Whether by convention or custom, LOAC recognizes that when armed conflict occurs, humanity becomes a potentially endangered species. To protect the unique groups of the human family from purposeful extermination, LOAC in effect adopts the LEP concept that extinction of any species is something to avoid. But LOAC goes further by making it an international crime to commit such acts.

99. For example, preventing the birth of children; transferring children; imposing severe conditions of life; or killing or causing serious harm to any national, ethnic, racial or religious group, with the intent to destroy in whole or in part such a group. Included within the list of activities which are prohibited are conspiracy, incitement, attempt, and complicity to commit genocide. Convention on the Prevention and Punishment of the Crime of Genocide, *supra* note 98, at arts. 1 & 2.

100. Convention to Protect War Victims, *supra* note 87. The treaty prohibits "violence to life and person, in particular murder of all kinds, mutilation, cruel treatment and torture . . . as to persons taking no active part in the hostilities." *Id.* at art. 3. It calls for the humane treatment of such persons "without any adverse distinction founded on race, colour, religion, or faith, sex, birth or wealth or any other similar criteria." *Id.*

101. See *supra* text accompanying note 93.

102. A. VON KNIERIEM, *THE NÜREMBERG TRIALS* (1959) (detailing the genocidal activities of convicted World War II war criminals).

103. See Nüremberg Tribunal, *supra* note 94, at principle VI(c).

104. See S. MALLISON & W. MALLISON, *supra* note 93, at 36-37.

5. *Protocol I to the 1949 Geneva Conventions*

In the context of the international law of environmental protection, Protocol I to the 1949 Geneva Conventions is a reaction to the perceived excesses of the Vietnam War.¹⁰⁵ These perceived excesses were in many ways the arguably ingenious application of modern technology to the waging of guerilla warfare. The Stockholm International Peace Research Institute (SIPRI) argues that the various methods the United States used during the war had an excessively adverse impact on the environment of Indochina.¹⁰⁶

Whereas the 1949 Geneva Conventions were geared more towards protecting the victims of armed conflicts, Protocol I conforms to the spirit of the Hague Conventions on Land Warfare of 1899/1907, by stressing the means and methods by which war can be waged.¹⁰⁷ In doing this, however, Protocol I not only supplements the Hague Conventions, but also effectively increases the protection

105. Aldrich, *Some Reflections on the Origins of the 1977 Geneva Protocols*, in STUDIES AND ESSAYS ON INTERNATIONAL HUMANITARIAN LAW AND RED CROSS PRINCIPLES 129-31 (C. Swinarski ed. 1984); H. LEVINE, PROTECTION OF WAR VICTIMS: PROTOCOL I TO THE 1949 GENEVA CONVENTIONS 259-60 (1979); Mallison & Mallison, *The Juridical Status of Privileged Combatants Under the Geneva Protocol of 1977 Concerning International Conflicts*, 42 LAW & CONTEMP. PROBS. 6 (1978).

106. SIPRI noted that it is axiomatic that warfare is detrimental to the environment—both the preparation for war and its actual conduct. Nonetheless, it suggests that many of the means chosen by the United States were excessive, and out of proportion to the military benefits achieved. See SIPRI, *supra* note 5, at 88. The widespread use of heavy munitions and tractors, incendiary weapons and herbicides to deny cover and food to the enemy; the use of anti-personnel chemicals and weather manipulation techniques to harass the enemy and for other military purposes; and the bombing of dams, dikes, and seawalls; all, according to SIPRI, posed, and continue to pose, serious environmental problems for Indochina in its reconstruction efforts. It should be noted that the official U.S. position is that the bombing of dams and dikes was either inadvertent or collateral *Id.*

The environmental impact from such forms of warfare are many. The impact includes destruction of large numbers of plants, trees and animals; erosion and flooding from the lack of ground cover; contamination of surface and ground waters by the various chemicals released from all of the destructive processes cited; vast disruption of the human population by all of the above; destruction of crops and croplands; propagation of disease (by bomb craters, which act as small lakes, incubating malaria carrying mosquitoes); and the presence of unexploded ordinance (which often go off, killing farmers who are trying to reclaim the land). *Id.*; see J. ROBINSON, *supra* note 74. Finally, although the weather modification effects were probably transitory, the use of herbicides in Vietnam may have resulted in a permanent modification of the weather in some areas, due to the lack of ground cover, which decreases humidity and carbon dioxide levels, and increases ground temperatures, all of which have an impact on the climate. SIPRI, *supra* note 5, at 48; W. VERWEY, RIOT CONTROL AGENTS AND HERBICIDES IN WAR 148 (1977).

107. Aldrich, *Progressive Development of the Laws of War: A Reply to Criticisms of the 1977 Geneva Protocol I*, 26 VA. J. INT'L L. 693-94, 699 (1986). This is not to suggest that Protocol I does not also continue to develop rules protecting the participants and victims of war. For instance, Protocol I prohibits the use of starvation of civilians as a method of war. In fact, Protocol I has many provisions that bolster the prohibitions on chemical, biological, and genocidal warfare, and attacks on cultural and historical objects. Aldrich notes: "Protocol I marks the first significant development of the laws of war since 1907." *Id.* at 699.

given the victims of armed conflicts.¹⁰⁸ The specific limitations on warfare of Protocol I that are based on environmental protection principles are as follows:

a. Protection of Objects Indispensable to the Survival of the Civilian Population¹⁰⁹

These provisions primarily seek to protect the victims of war. But they also have a LEP character, since the use of herbicides on crops or agricultural lands can not only cause starvation, but disturb the ecosystem, and contaminate ground and surface waters used for drinking or irrigation.

b. Protection of the Natural Environment

This is the broadest of all the environmental protection provisions of Protocol I. It requires combatants "to protect the environment against widespread, long-term and severe damage," and prohibits "methods or means of warfare which are intended or may be expected to cause such damage to the natural environment."¹¹⁰ The definition of the terms used is in dispute, but it is clear that this provision now places a limit on the mindless mayhem which nor-

108. See B. JAKOVljeVIC, *supra* note 92, at 1; see also Protocol I, *supra* note 65, at arts. 1, 3; Takemoto, *The 1977 Additional Protocols and the Law of Treaties*, in *STUDIES AND ESSAYS ON INTERNATIONAL HUMANITARIAN LAW AND RED CROSS PRINCIPLES* 249 (C. Swinarski ed. 1984).

109. Protocol I, *supra* note 65, at art. 54. The convention prohibits attacks on food-stuffs, agricultural areas, crops, livestock, drinking water installations and irrigation works, if undertaken to deny their use by the civilian population for sustenance. If used solely by the armed forces, or for their direct support, they can be attacked, unless it would cause starvation or forced movement of the civilian population. Article 54 also spells out when a scorched earth policy is permissible. It allows such action by a nation in defense of its territory against invasion, where the nation has such territory under its control. *Id.*

110. *Id.* at art. 55; see also *id.* at art. 35(3). The meaning of the terms "widespread, long-term and severe damage," is not spelled out. Conference reports indicate that "collateral damage from conventional warfare, even very severe damage such as that which occurred in France in World War I, was not intended to be covered, and that long-term should be understood in terms of decades." Aldrich, *supra* note 107, at 711. However, similar terms are used in the 1977 Environmental Modification Convention (ENMOD). See *infra* note 117 and accompanying text. In the Understanding Relating to Article 1 of the ENMOD, these terms are defined as:

(a) widespread: encompassing an area on the scale of several hundred square kilometers;
(b) long-lasting: lasting for a period of months, or approximately a season;
(c) severe: involving serious or significant disruption or harm to human life, natural and economic resources or other assets. See H. LEVINE, *supra* note 105, at 30.

Although the Understanding of the ENMOD specifically says that its definitions are "not intended to prejudice the interpretation of the same or similar terms if used in conjunction with any other international agreement," it has been observed that the better argument is that these definitions are applicable to Protocol I. *Id.*

mally accompanies war. Exactly what that limit is, is as yet unclear.

c. Protection of Works and Installations Containing Dangerous Forces¹¹¹

As in the case of objects indispensable to the survival of the civilian population, this limitation seeks to protect the victims of war. However, it too has a LEP quality because it seeks to prevent ecological damage from the release of a dangerous force. Although Protocol I is a most significant source of conventional LOAC, it is still too relatively new to have achieved universal acceptance.¹¹²

There is a very limited network of customary LOAC that bolsters Protocol I's protection of the environment from devastation. The starting point is the Hague Conventions on Land Warfare of 1899/1907, which are considered sources of customary law.¹¹³ The 1949 Geneva Convention (IV), viewed as a source of customary law, also provides a basic limit on destruction of property.¹¹⁴

Finally, a significant source of customary law against devastation of the environment is the Nüremberg Tribunal. A number of the

111. See Protocol I, *supra* note 65, at art. 56. This article protects dams, dikes, nuclear electrical generating stations, and other works or installations containing dangerous forces from attacks. Even where the work or installation has a military objective, it still cannot be attacked if the attack might cause a release of the dangerous force and a consequential severe loss among the civilian population. *Id.* at art. 56. There are exceptions to this, such as in the case of a dam or dike if it is used in regular, significant, and direct support of military operations and an attack is the only feasible way to terminate the support. See Aldrich, *supra* note 107, at 716.

112. See H. LEVINE, *supra* note 105, at xxii. Protocol I has been signed by sixty-two States, including the United States, and ratified or acceded to by fifty-seven States. *Id.*; Aldrich, *supra* note 107, at 694. The United States has not yet ratified this treaty. However in the U.S. Air Force Commander's handbook on armed conflict, Protocol I is mentioned repeatedly in a way that alerts the reader to the standard of conduct created by Protocol I, and yet reminds the reader the United States is not yet a party to the protocol. U.S. DEP'T AIR FORCE, *supra* note 78, *passim*. For example:

c. Dams, Dikes, and Nuclear Power Stations.

Protocol I to the 1949 Geneva Conventions restricts attacks against dams, dikes, and nuclear power stations, if "severe civilian losses might result from flooding or radioactivity. While the United States is not yet a party to this protocol, such attacks may be politically sensitive. Consult the Staff Judge Advocate for the exact status and provisions of Protocol I and the exceptions to its rules.

Id. at 2-1.

113. Hague Conventions on Land Warfare 1899/1907, *supra* note 69. Article 23(g) prohibits the destruction or seizure of enemy property "unless such destruction or seizure be imperatively demanded by the necessity of war"; Articles 28 and 47 prohibit pillaging; and article 55 places a duty on occupying forces to properly administer occupied lands. *Id.* at arts. 23(g), 28, 47, 55.

114. Convention to Protect War Victims, *supra* note 87. Article 55 prohibits the destruction of property, private or public, real or personal, unless absolutely necessary for military operations.

accused were tried for what amounted to the massive devastation of the environment.¹¹⁵ Although acquitted, the willingness of the tribunal to subject the accused to trial, and the holding of the tribunal that “devastation prohibited by the Hague Rules and the usages of war is that not warranted by military necessity,” make it clear that mindless destruction of the environment during armed conflict is not tolerated under customary LOAC.¹¹⁶

In summary, Protocol I provides significant new limits on the means by which war is waged. These limits are articulated in terms which have a LEP quality to them, and they reflect the desire of the world community to avoid the proliferation of “ingenious” yet environmentally devastating methods of warfare.

6. *Environmental Modification*

Just as there is a straightforward connection between LEP and LOAC in pursuing historic preservation and enforcing Protocol I, there is also a connection in preventing environmental modification techniques of waging war.

The 1977 Environmental Modification Convention (ENMOD), like Protocol I, was produced in reaction to the activities of the United States during the Vietnam War.¹¹⁷ By seeding cumulus clouds with silver and lead iodide, the United States tried to manipulate rainfall for military purposes. It is uncertain whether these efforts to manipulate the environment were effective. Nevertheless, SIPRI concluded that extensive and successful cloud seeding can result in flooding and erosion, disruption of wildlife and plantlife,

115. For instance, the scorched earth policy followed by the German forces in their retreats from the Soviet Union, the Balkans, and Norway, were the subject of trial.

116. The tribunal further held that the rule against devastation is clear enough but that the fact determination as to what constitutes military necessity is difficult. Detailed proof of the operational and tactical nature of the destruction can establish military necessity. It is not critically important whether a true military necessity existed—only if the defendant acted within the limits of honest judgment on the basis of conditions prevailing at the time. Where the conditions are sufficient to permit the defendant to honestly conclude that a military necessity warrants the decision to devastate the environment, the fact that his judgment was in fact in error does not make the defendant guilty of a crime. Finally, “a great deal of latitude must be accorded commanders who must make quick decisions in the heat of battle.” A. VON KNIERIEM, *supra* note 102, at 398-400.

117. Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques, May 18, 1977, 31 U.S.T. 333, T.I.A.S. No. 9614 [hereinafter ENMOD]; SIPRI, *supra* note 78, at 40; PROHIBITING ENVIRONMENTAL MODIFICATION AS A WEAPON OF WAR, S. REP. NO. 270, 93d Cong., 1st Sess. 1-2 (1973); Westing, *supra* note 77, at 645. The most noteworthy signatories to the treaty are the People's Republic of China, the Soviet Union, France, and the United States.

and the presence of silver and lead iodide in the food chain.¹¹⁸

There are three significant differences between Protocol I and the ENMOD. First, the ENMOD prohibits widespread, long-lasting or severe effects, while Protocol I prohibits widespread, long-term and severe damage to the environment.¹¹⁹ Second, Protocol I deals with any method of warfare that is intended to cause damage to the environment, while the ENMOD is limited to methods that manipulate the environment.¹²⁰ Third, Protocol I governs relations between belligerents, while the ENMOD controls relations between State parties to the treaty.¹²¹

In the absence of the ENMOD, environmental modification as a means of warfare would be permissible, if military necessity existed. The ENMOD, however, takes away this justification for State parties to it in relationships with each other.

7. Reprisals

A reprisal is: “[A]n act of retaliation in the form of conduct which would otherwise be unlawful, resorted to by one belligerent against enemy personnel or property for acts of warfare committed by the other belligerent in violation of the law of war for the purpose of enforcing future compliance with the recognized rules of civilized warfare.”¹²²

The principle of reprisal is one of customary LOAC. However,

118. See SIPRI, *supra* note 5, at 55. The manipulation of rainfall was supposed to destroy enemy lines of communication and supply; extend the rainy season and make enemy offensive operations difficult; create disruptive floods; redirect enemy manpower to dealing with the damage caused by the excessive rain; mask covert U.S. ground operations; and render inoperable enemy radars used to control surface-to-air missile batteries (and thus protect U.S. flying missions over Vietnam).

In response to unofficial reports of such activities, in 1972 the Senate passed a resolution asking the government to seek an agreement with other governments to prohibit such methods of warfare. PROHIBITING ENVIRONMENTAL MODIFICATION AS A WEAPON OF WAR, *supra* note 117, at 1. The Senate Committee on Foreign Relations concluded that use of rainmaking as a weapon of war could only lead to the development of more vastly dangerous environmental modification techniques, which might cause irreparable harm to the global environment. *Id.* at 5.

The ENMOD resulted from the U.S. government's efforts in seeking such an agreement. Article I prohibits military or other hostile use of “environmental modification techniques having widespread, long-lasting or severe effects as the means of destruction, damage, or injury to any other State Party.” ENMOD, *supra* note 117. Environmental modification techniques are defined as the deliberate manipulation of natural processes to change the “dynamics, composition or structure of the Earth, including its biota, lithosphere, hydrosphere and atmosphere, or of outer space.” *Id.* at art. II.

119. SIPRI, *supra* note 78, at 40.

120. *Id.* at 63; Westing, *supra* note 77, at 646.

121. Westing, *supra* note 77, at 665.

122. U.S. DEP'T ARMY, *supra* note 87, at 107.

under several conventions, reprisals against a number of items are now forbidden.¹²³ Effectively the only objects left for reprisals are enemy troops and their military facilities that use illegal weapons.¹²⁴ In the end, all of this inures to the benefit of LEP and the world's desire to protect the environment. But more importantly, it again evidences the presence within LOAC of a concern for the environment, and the realization that it deserves significant protection.

B. Conclusory Observations Regarding the LEP Aspects of LOAC

It has been demonstrated that there are aspects of LOAC which reflect the international law of environmental protection. These LEP aspects fall into two categories.

In the first category, LOAC freely adopts LEP to create limitations on armed conflict. For example, Article 55 of Protocol I limits widespread, long-term and severe damage to the environment. The primary purpose of these limitations is to protect the environment. A second purpose is to limit the mayhem of war.

The second category exists when LEP can be used to bolster pre-existing limitations on armed conflict. This occurs in Article 56 of Protocol I, which prohibits destruction of works and installations containing dangerous forces. The primary purpose of the second type of limitation is to limit the mayhem of war, and secondarily to benefit the environment.

III. PHILOSOPHICAL RELATIONSHIP BETWEEN LOAC AND LEP

There is clear interplay between these two legal regimes—primarily one of LOAC borrowing from LEP. The natural-

123. See Hague Conventions on Land Warfare 1899/1907, *supra* note 69. The conventions prohibit the imposition of a "general penalty, pecuniary or otherwise . . . upon the population on account of the acts of individuals for which they cannot be regarded as jointly and severally responsible." *Id.* at art. 50. The 1949 Geneva Convention (IV) prohibits reprisals against protected persons and their property. See Convention to Protect War Victims, *supra* note 87. The Hague Cultural Convention of 1954 prohibits reprisals against cultural property. See Hague Convention on Cultural Property, *supra* note 92. Finally, Protocol I prohibits reprisals against civilian objects, Protocol I, *supra* note 65, at art. 52, cultural objects, *id.* at art. 40, objects indispensable to the survival of the civilian population, *id.* at art. 54, the natural environment, *id.* at art. 55, and works and installations containing dangerous forces. *Id.* at art. 56. Protocol I substantially eliminates reprisals as a method of enforcing the rules of war. See Aldrich, *supra* note 107, at 710.

124. *Id.*; Lysaght, *The New Humanitarian Law of Armed Conflict*, in PROCEEDINGS OF THE 1976 AND 1977 CONFERENCES 184 (Antonio Cassese ed. 1980).

ness of the interplay between LOAC and LEP becomes clearer in an analysis of their philosophical relationship.

A. *The Philosophy of LOAC*

There are two basic principles that underlie LOAC. First, the principle that necessity justifies war; i.e., the “maintenance of public order legitimates the use of force.”¹²⁵ Second, the principle that humanity, which “requires action always for man’s good,” both supports the use of war to maintain public order, and limits the violence war naturally generates.¹²⁶ These two principles combine to form the principle of humanitarian law that “respect for the individual and his well-being shall be ensured as far as it is compatible with public order and, in time of war, with military exigencies.”¹²⁷

From these principles come three interrelated articulations of how war should be waged in light of the limitation of humanity. First, “belligerents do not have unlimited choice in the means of inflicting damage on the enemy.”¹²⁸ This is because there is a need for proportionality during war—which is the second articulation. It requires that “belligerents not inflict harm on their adversaries out of proportion with the object of warfare, which is to destroy or weaken the military strength of the enemy.”¹²⁹ Third, the principle of proportionality is satisfied when the principle of military necessity is satisfied. Military necessity “permits a belligerent to apply only that degree and kind of regulated force, not otherwise prohibited by the laws of war, required for the partial or complete submission of the enemy with the least possible expenditure of time, life, and physical resources.”¹³⁰

125. J. PICTET, HUMANITARIAN LAW AND THE PROTECTION OF WAR VICTIMS 28-29 (1975); J. Pictet, Principles of Humanitarian Law (undated chart).

126. J. PICTET, *supra* note 125; U.S. DEP’T ARMY, *supra* note 87, at § 220(b). One writer has noted that a better term for this concept might be the “requirements of civilization,” since it sounds like a better counterbalance to the principle of the necessity of war. Abi-Saab, *The Specificities of Humanitarian Law*, in STUDIES AND ESSAYS ON INTERNATIONAL HUMANITARIAN LAW AND RED CROSS PRINCIPLES 265 (C. Swinarski ed. 1984).

127. J. PICTET, *supra* note 125, at 29; *see also* J. Pictet, Principles of Humanitarian Law, *supra* note 125.

128. This is referred to as the Law of the Hague. J. Pictet, Principles of Humanitarian Law, *supra* note 125.

129. S. MALLISON & W. MALLISON, *supra* note 93, at 27; M. McDUGAL & F. FELICIANO, LAW AND MINIMUM WORLD PUBLIC ORDER: THE LEGAL REGULATION OF INTERNATIONAL COERCION 241 (1961); J. PICTET, *supra* note 125, at 31; J. Pictet, Principles of Humanitarian Law, *supra* note 125.

130. U.S. DEP’T NAVY, LAW OF NAVAL WARFARE § 220(a) (1955); U.S. GOV’T PRINTING OFFICE, 11 TRIALS OF WAR CRIMINALS BEFORE THE NÜREMBERG MILITARY

These three articulations are sometimes collectively referred to as the principle of military necessity. There are three subprinciples which emanate from military necessity. First, *ratione personae* prohibits deliberate attacks against non-combatants, and requires leaving them outside the area of operations as much as possible. Second, *ratione loci* limits attacks to military objective—those whose total or partial destruction would constitute a definite military advantage. Third, *ratione condition* prohibits weapons and methods of warfare likely to cause excessive suffering.¹³¹

By complying with these three subprinciples, two things are achieved. First, humanity is furthered by limiting the destruction of human and material values.¹³² Second, economy in use of forces is obtained, because “destruction of values unnecessary to obtain military objectives is an uneconomical use of force since it involves expenditures of force without return in net military advantage.”¹³³ It is because military necessity can further humanity, and humanity can further the use of military force, that it is said that each principle is really an element in a larger composite principle that comprises both military necessity and humanity.¹³⁴

TRIBUNALS UNDER INTERNATIONAL LAW No. 10, at 1254 (1947).

131. J. Pictet, *Principles of Humanitarian Law, supra* note 125.

132. *See* Mallison, *supra* note 2, at 313.

133. *Id.* at 314-15. This concept is sometimes referred to as the principle of economy of coercion, which is achieved by complying with the principle of proportionality. M. McDUGAL & F. FELICIANO, *supra* note 129, at 242.

134. *See* Mallison, *supra* note 2, at 314. A good discussion of the relationship between military necessity and humanity can be found in the Nüremberg Tribunal case of *United States v. List*. There the tribunal noted that military necessity:

permits the destruction of life of armed enemies and other persons whose destruction is incidentally unavoidable by the armed conflicts of war; it allows the capturing of armed enemies and others of peculiar danger, but it does not permit the killing of innocent inhabitants for purposes of revenge or the satisfaction of a lust to kill. The destruction of property to be lawful must be imperatively demanded by the necessities of war. Destruction as an end in itself is a violation of international law. There must be some reasonable connection between the destruction of property and the overcoming of the enemy forces. It is lawful to destroy railways, lines of communication, or any other property that might be utilized by the enemy. Private homes and churches even may be destroyed if necessary for military operations. It does not admit the wanton devastation of a district or the willful infliction of suffering upon its inhabitants for the sake of suffering alone.

U.S. GOV'T PRINTING OFFICE, *supra* note 130, at 1253.

Of significance in this excerpt is the philosophical recognition by LOAC that incidental and unavoidable harm to normally protected persons and places is possible during armed conflicts. Such occurrences, if military necessity truly existed at the time, are not a violation of LOAC and are not punishable as war crimes. LOAC, through the principles of military necessity and humanity can not protect from all harms—just excessive suffering and damage.

B. *The Philosophy of LEP*

The philosophy of environmental protection is based on the question: Why should humanity protect its environment? The answer is best seen through the writings of environmental experts. The observations of these experts are based on a scientific appreciation of humanity's position in the global ecosystem.

In 1949, Aldo Leopold, an American environmentalist and writer, in an essay entitled *The Land Ethic*, noted that "there is a need for every citizen to realize that the earth is not here for humans to manipulate, but that we exist as part of an interrelated world."¹³⁵ He called for the active practice of what he termed a land ethic. He defined this as realizing that the human community includes the soil, water, plants and animals, or collectively, the land; and realizing that Homo Sapiens is an ordinary member and citizen of the land.¹³⁶

The United Nations, in its *World Charter for Nature*, noted that mankind is a

part of nature and life depends on the uninterrupted functioning of natural systems which ensure the supply of energy and nutrients. . . . Civilization is rooted in nature; every form of life is unique warranting respect regardless of its worth to man, and to accord other organisms such recognition, man must be guided by a moral code of action.¹³⁷

The concept that humanity is a part of, and dependent on, nature and its environment has come to the forefront of the international scene. This is because of the realization that "society as we know it may simply not survive unless there is a stable relationship between ourselves and the natural systems that support us."¹³⁸ The land ethic that Leopold describes is the means by which a stable relationship can be achieved.

From the land ethic comes the next basic philosophy of the environmental movement—the environment should be left untrammelled by humanity to the maximum extent possible. Whether it is the clearcutting of a large forest, or the dumping of hazardous waste, the less of an intrusion on the environment, the better.¹³⁹ Curtailing

135. Cahn, *A Search for an Environmental Ethic*, EPA J. 6-8 (Nov.-Dec. 1979).

136. *Id.* John Muir, also an American environmentalist and writer, captured the spirit best: "We all dwell in a house of one room—the world with the firmament for its roof—and are sailing the celestial spaces without leaving any track." *Id.* at 8.

137. See *World Charter for Nature*, *supra* note 28, at preamble.

138. *Threats to Biological Systems*, *supra* note 54, at 14.

139. As the 18th century English poet Gerard Manley Hopkins put it: "What would

the exploitation of the environment is viewed as the best means to assure the survival of humanity.

Counterbalancing this philosophy of no exploitation is the recognition that the environment must be exploited to a certain extent. After all, the survival of Homo Sapiens is also dependent on its ability to extract natural resources for its sustenance. A blending of the land ethic, the concept of limiting the exploitation of the land, and the concept of the inevitability of some exploitation, results in what can be called an environmental ethic. This ethic, recognizing humanity's position in nature, calls for limits on the exploitation of the environment. In any given situation where humanity is considering exploiting the environment, it should question whether such exploitation is truly necessary. If it is necessary, are there alternatives that can be pursued to achieve the same goal with less harm to the environment? If the exploitation is necessary, and there are no practical alternatives, do the costs of the project exceed the benefits to be achieved? And if the benefits exceed the costs, what measures can be taken to minimize the harm caused by the project?¹⁴⁰

In fleshing out the environmental ethic there are two final principles that arise. First is the importance of recycling and "doing more with less."¹⁴¹ By reutilizing resources already extracted from the environment (e.g., refurbishing old buildings), and by a philosophy of design that seeks to create ever more efficient products (from toasters to houses), there will be less need to despoil nature. The second principle is sensitivity to the complete interrelatedness of everything in the environment. As John Muir said nearly a century ago: "Everything in the world is hitched to everything else."¹⁴²

In summary, the philosophy of LEP is to practice the environmental ethic when confronting situations where the purity of the environment is at risk. This ethic appreciates that some degradation is inevitable but that it can be channeled so as to minimize the harm it causes the environment.

the world be once bereft of wet and wildness? Let them be left. . . ." WILDERNESS, inside front cover (Summ. 1984).

140. These concepts are a very loose parallel of some of the requirements of the National Environmental Policy Act, 42 U.S.C. §§ 4321-4370 (1982); see also Ripley, *Conservation: A Moral Responsibility*, EPA J. 4-5 (Nov.-Dec. 1979).

141. Fuller, *Spaceship Earth: Is It In For Trouble?*, EPA J. 18-20 (June 1978).

142. *Id.* at 27; WILDERNESS, inside front cover (Wint. 1983).

C. *Relating the LOAC and LEP Philosophies*

There is much that these two philosophies share. Both accept the inevitability of certain events—LOAC accepts war, and LEP accepts the exploitation of the environment. Although war and exploitation of the environment are ostensibly viewed as undesirable, both philosophies recognize the good they can achieve—war allows the restoration of public order, and exploitation of the environment allows for the survival of society.

To allow good to arise from these events, both philosophies attempt to limit their destructive natures. LOAC limits war in the name of humanity, allowing devastation to occur only when justified by military necessity. LEP limits exploitation of the environment in the name of nature, to which humanity owes its existence, and allows devastation to occur only when the environmental ethic is satisfied. Both philosophies seek to protect humanity from needless suffering and extinction. LOAC directly seeks this by controlling the way war is waged, and LEP indirectly seeks this by protecting the environment upon which *Homo Sapiens* depends.

Earlier it was noted that the LOAC principles of military necessity and humanity are really elements of a larger composite principle that comprises both. The same can be said of the land ethic, the environmental ethic, and the other philosophical bases of LEP. In fact, this larger composite principle of LOAC and of LEP can be viewed as one and the same. This principle is conservation. In LOAC, the rules seek to conserve the military forces of the belligerents, and to conserve the surroundings of the battlefield from senseless destruction. In LEP, the conservation is more straightforward—the law seeks to protect the environment from mindless exploitation.

IV. THE PRACTICAL RELATIONSHIP BETWEEN LOAC AND LEP

The basic premise of this Article is that LEP can be used to articulate the environmental protection concepts of LOAC. Having established that LOAC and LEP have a common basis in practice and philosophy, there are four observations that can be made of the relationship between LOAC and LEP.

A. *LEP Limitations on LOAC*

Although LEP concepts can be found in LOAC, LEP will never seriously hamstring the function of LOAC and the operation of

war. As noted previously, it is "axiomatic that warfare is detrimental to the environment."¹⁴³ The most that LEP can ever do is to inject some necessary limitations on the means, methods, and objects of war. This is not a revolutionary concept, since States have had other types of limitations placed on their ability to wage war.

B. *Violations of LOAC*

LOAC will always be in a superior position to LEP. If a belligerent were to cause "widespread, long-term and severe damage" to the environment in violation of Protocol I, this would be a violation of LOAC, and not of LEP. LOAC will at the most refer to LEP to help in any analysis of a potential LOAC violation.¹⁴⁴

C. *Using LEP to Interpret Protocol I*

LEP can be most useful to LOAC in interpreting Protocol I. Examples of how to use LEP include:

1. *Objects Indispensable to the Survival of the Civilian Population*

The description in Article 54 of typical indispensable objects is rather extensive. Two items within LEP should be considered when planning military operations and trying to comply with this article: toxic pollution of the food chain and aquifers.

In the mid-part of the twentieth century, there was an outbreak of what has been called "Minamata disease" in Japan. Due to discharges of wastes containing mercury compounds, industry contaminated the fishing grounds near the Japanese town of Minamata. The mercury worked its way up the food chain, and bioaccumulated in the cells of the various marine organisms consumed by the people of the town. The result was a degenerative nerve disorder that left its victims disfigured, incapacitated, and in severe pain.¹⁴⁵

The message for LOAC is clear. Now that we know the effects of discharges of hazardous wastes into the ecosystem, care must be taken to prevent pollution of the local populace's sources of food. For instance, in the realm of naval warfare, this might require careful target selection so as to ensure the cargo of a merchant

143. See SIPRI, *supra* note 5, at 88.

144. Some writers have suggested that a LEP-type violation of LOAC might be best titled the crime of ecocide. *Id.* at 1; SIPRI, *supra* note 78, at 41.

145. Tolba, *The State of the Environment*, EPA J. 5 (June 1978).

freighter does not pollute the waters into which it sinks.¹⁴⁶ Due to the relatively anonymous way in which submarines can pick off such craft, this admittedly would be very difficult for war planners to achieve. Nonetheless, the dictates of Article 54 are clear, and the experience of Minamata is undeniable.

The second item to consider when planning military operations is the aquifer. Aquifers are large underground formations of water bearing rock. The international environmental protection community has appreciated for many years how important such natural structures are to the environment. Aquifers have taken many centuries to reach their present size. They hold perhaps sixty times as much fresh water as is found in all the lakes and streams on the surface of the earth. From surface waters and other underground water sources, aquifers slowly develop in size. Their function is to provide the drinking water used in private and commercial wells, irrigation water for agricultural purposes, and on occasion they are the source of springs that feed into bodies of surface water. Aquifers are vulnerable to depletion by excessive human demands, and contamination by hazardous substances placed onto or into the ground. Once contaminated, underground water sources are very difficult and expensive to clean. Until purged of contaminants, users must resort to other sources of water.¹⁴⁷

Again the message is clear. LOAC needs to consider the impact of military activities on aquifers. They clearly can be indispensable objects to the survival of the civilian population. At the very least, the widespread use of any chemicals must be tempered by the consideration that such chemicals might percolate through the soil and contaminate ground water.¹⁴⁸ It might not be too farfetched for military civil engineers to become proficient in the area of underground hydrology, so they can give commanders advice on the environmental impact of proposed military operations.

2. *Protection of the Natural Environment*

Articles 35(3) and 55 of Protocol I are perhaps the most important environmental protection aspects of LOAC. They both require significant consideration of the environmental impact of military weapons and methods during combat. However, the scope of these

146. See SIPRI, *supra* note 4, at 152.

147. TOWARD A BETTER ENVIRONMENT FOR OUR WORLD TOMORROW 102-05 (1973).

148. This may also apply to the limited use of herbicides by the United States. See *supra* note 78 and accompanying text.

articles is rather limited, and would have little effect on conventional warfare.¹⁴⁹

This means that field commanders more than likely would not have to second guess their tactical instinct to destroy a given military target. If there were a pitched tank battle between belligerents that caused widespread, long-term and severe damage, this would be defensible. In effect, military necessity is somewhat of an exception to Article 55 of Protocol I. But the necessity would have to be something similar to self defense, such as pitched battle or engaging the enemy in combat. Mere denial of ground cover to the enemy is not a military necessity. Many of the war crimes trials that involved the mass destruction of the environment might be resolved differently today, due to the standards of LEP and Article 55 of Protocol I. However, the standard of review would be the same: did the commander act within the limits of honest judgment such that military necessity might be a defense to the destruction he caused? In the absence of a "military necessity defense," Protocol I would hold a commander criminally liable when the commander causes extensive damage.

LEP can therefore be of assistance in interpreting Article 55. Awareness of LEP can sensitize military leaders to the assimilative capacity and recuperative ability of the environment within which they are fighting. By learning something about the science of environmental protection, they will be in a better position to form the honest judgment necessary to utilize the military necessity defense if their judgment is ever second-guessed.

3. *Works and Installations Containing Dangerous Forces*

The international community has learned some painful lessons about the destructive potential of its industrial facilities. In 1976 there was a leak from a chemical plant in Seveso, Italy. A cloud of trichlorophenol gas, which is a highly toxic defoliant known to

149. Bothe, Partsch & Solf, *New Rules for Victims of Armed Conflicts*, in THE NEW HUMANITARIAN LAW OF ARMED CONFLICT: PROCEEDINGS OF THE 1976 AND 1977 CONFERENCES 348 (A. Cassese ed. 1980).

[I]n the view of the well established and uncontradicted interpretation in the Report of the Committee [which drafted Protocol I], as well as that made in declarations, Articles 35(3) and 55 will not impose any significant limitations 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 that would produce widespread, long-term, and severe damage to the natural environment.

Id.

cause liver and kidney damage and genetic alterations (also known as Agent Orange) was released into the air. Many therapeutic abortions were performed as a precautionary measure, and thousands of people were forced to evacuate their homes.¹⁵⁰

In 1984, in Bhopal, India, a cloud of poisonous methyl isocyanate gas was released from a pesticide plant. Over 1,600 people were killed, and 50,000 injured by this incident.¹⁵¹

In 1986 there was a fire at a chemical warehouse near Basel, Switzerland. A chemical spill resulted, leaking several hundred tons of insecticides and other toxic chemicals into the Rhine river. Experts noted that as a result, ten years of progress in cleaning the Rhine have been reversed.¹⁵²

Applying the environmental lessons of these tragic events to Article 56 of Protocol I, the list of “works and installations” that should not be attacked should be enlarged to include chemical plants. More importantly, it is necessary to take a close look at the entire industrial capacity of an enemy. Many factories store and use in large quantities the same kinds of toxic materials manufactured by chemical plants. This calls for either more sophisticated industrial espionage and targeting by belligerents of their enemies, or more openness by States in proclaiming the “dangerous forces” their factories contain, so as to avoid the accidental release of poison gas as occurred in Seveso and Bhopal, or the contamination of surface waters as occurred in Basel.

D. Environmental Concerns

LOAC and LEP are interrelated topics of growing concern to the international community. The major concern is for the destruction of the environment by the excessive demands of humanity, and the harmful effects of the production, testing, stockpiling, and use of military weapons.¹⁵³

One further twist on this relationship is that concern for the environment and the scarcity of natural resources might in fact cause or justify future wars.¹⁵⁴ This could result if a State tries to seize the natural resources of another, or in the case of “ecological ag-

150. *Italian “toxic cloud,”* 36 FACTS ON FILE no. 1864, July 31, 1976, at 560; Tolba, *supra* note 145, at 5.

151. *Gas Leak in India Kills at Least 1,600, Injures at Least 50,000,* 44 FACTS ON FILE no. 2299, Dec. 7, 1984, at 897.

152. *See Rhine River Polluted by Chemical Plant Fire,* *supra* note 35.

153. *See J. ROBINSON,* *supra* note 74, at vii.

154. *See SIPRI,* *supra* note 4, at 185.

gression," in which one State intentionally or negligently pollutes another State's environment. Several writers have suggested that the major threat to world security in the future will be the deterioration of biological systems as populations continue to expand.¹⁵⁵ Concern for the environment, instead of being a limitation on armed conflict, could become the source of a major international irritant that might lead to future armed conflicts.¹⁵⁶

Hopefully States will be so concerned about the threat to their national security posed by environmental deterioration, that they will realize that emphasizing military strength is futile and counterproductive. Such a realization would ideally result in the redirection of States' budgets towards solving environmental problems, and away from expansion of the military.¹⁵⁷

In summary, the interplay between the rules of LOAC and LEP and the similarity in their philosophies creates a need to consider the environmental principles and experiences of LEP when interpreting the environmental aspects of LOAC. As a result, selection of military weapons, methods, and objects of attack should also be based on ecological considerations, such as the impact on nature, the destruction of nature's natural balance, and the introduction of irreversible processes.¹⁵⁸

CONCLUSION

Environmental warfare has been used throughout history. The primary technique has been to exploit the pent up energy that exists within the environment. Military strategists have long known that a relatively modest expenditure of energy can trigger the release of substantially greater amounts of destructive energy. As noted by Arthur H. Westing, the two major forms of energy that have been released are fires emanating from the fuel represented by forests and vegetation, and bodies of water released from dams, dikes, levees and other structures.¹⁵⁹

What needs to be clarified, however, is that over the years there has been a tendency for wars to cause greater destruction of the environment than ever before. Comparison of the experiences of the

155. See Brown, *Redefining National Security*, *supra* note 54, at 38; Lee, *Helping Global Clean-Up*, EPA J. 23 (June 1978); Leider, *Strategies for an Environmental Decade*, 16 ORBIS 881 (1973).

156. Leider, *supra* note 155, at 881.

157. Lee, *supra* note 155, at 23.

158. SIPRI, *supra* note 78, at 43.

159. Westing, *supra* note 77, at 646.

United States during World War II, the Korean War, and the Vietnam War are instructive. Battle intensity, as measured in number of casualties, decreased by ratios of 3:2:1. The number of enemy killed during these wars also decreased by the same ratios. Therefore, the United States was not killing more enemy than in each previous war. However, the sheer amount of munitions expended in Vietnam was greater than the other two wars combined, at ratios of 1:5:7; and the amount of munitions per enemy soldier killed increased at ratios of 1:6:18.¹⁶⁰ SIPRI concluded from these figures that the higher munitions expenditures with no proportional increase in enemy casualties suggest that these munitions were used against larger and more ill-defined target areas, resulting in higher levels of environmental damage.¹⁶¹

Today, humanity is capable of causing even greater damage in future conflicts. Arthur H. Westing postulated a number of serious harms that could result from such sophisticated assaults: nuclear weapons could be used to divert the flight of asteroids to strike enemy territory; “windows” could be opened in the earth’s ozone layer in the stratosphere to allow injurious ultraviolet radiation to penetrate; weather control could create landslides, mudslides and avalanches; nuclear weapons could be used to instigate earthquakes, tidal waves, and destruction of dams and dikes; finally, with the incredible accuracy of computer and laser guided munitions, assaults on merchant vessels—particularly the oil bearing super tankers—could make the oceans a particularly contaminated region.¹⁶²

It is because of this environmentally destructive trend in modern warfare, and the development of technology capable of even greater destruction, that LOAC has adopted LEP principles. One counterbalance to these two dangerous trends is that today, under conventional and customary law, the environment must receive some consideration during military operations. The importance of preserving the environment has finally been recognized as a factor to consider when deciding which means and methods will be used during

160. See SIPRI, *supra* note 4, at 4.

161. *Id.*

162. Westing, *supra* note 77, at 646-52. Several thousand red Chinese were drowned when a dam across the Yellow River was dynamited in June 1938. This action was an ostensibly defensive one, to stop the Japanese advance into China. This act of environmental warfare appears to have been the most devastating single act in all of human history, in terms of lost lives. *Id.*

armed conflicts, and which targets will be attacked.¹⁶³

A second counterbalance to the destructive trend of warfare is the “ratchet effect” or “non-rolling back” nature of LOAC. Once conventions are widely acceded to, and are “recognized and accepted by the International Community of States as a whole,” the treaties become a permanent benchmark for gauging the future conduct of nations.¹⁶⁴ The trend over the centuries has been to improve on the humanitarian principles present in the current body of law, and to resist backsliding. In the case of the environmental protection aspects of LOAC, perhaps the twin trends of greater environmental destruction and technological capacity to destroy the environment will be permanently counterbalanced.

163. SIPRI, *supra* note 78, at 41.

164. Abi-Saab, *supra* note 126, at 280.

