

Protection of the Environment in International Armed Conflict

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I. Introduction

The importance of the environment is universally acknowledged. As the ICJ proclaimed in 1996, in its Advisory Opinion on the *Legality of the Threat or Use of Nuclear Weapons*:

“the environment is not an abstraction but represents the living space, the quality of life and the very health of human beings, including generations unborn”.¹

Attacks in wartime against military objectives² often impact upon the environment. Oil facilities as military objectives can serve as a prime example. When an oil refinery is struck, this may give rise to toxic air pollution. When an oil storage facility is demolished, the oil may seep

¹ Advisory Opinion on *Legality of the Threat or Use of Nuclear Weapons*, ICJ Reports 1996, 226 et seq., (241, para. 29).

² Military objectives are authoritatively defined as “those objects which by their nature, location, purpose or use make an effective contribution to military action and whose total or partial destruction, capture or neutralization, in the circumstances ruling at the time, offers a definite military advantage”, article 52 para. 2 of Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol I), 1977, reproduced in: D. Schindler/ J. Toman (eds), *The Laws of Armed Conflict: A Collection of Conventions, Resolutions and Other Documents*, 1988, 3rd edition, 621 et seq., (645).

into the ground and poison water resources. When an oil tanker is sunk at sea, the resultant oil spill may be devastating for marine life.³

The ICJ, in the above mentioned case, went on to say:

“States must take environmental considerations into account when assessing what is necessary and proportionate in the pursuit of legitimate military objectives. Respect for the environment is one of the elements that go to assessing whether an action is in conformity with the principles of necessity and proportionality”.⁴

Proportionality means that the collateral harm must not be “excessive in relation to the concrete and direct military advantage anticipated” when an attack is launched against a military objective.⁵ It follows from the Court’s dictum that, in accordance with the principle of proportionality, “an attack on a military objective must be desisted from if the effect on the environment outweighs the value of the military objective”.⁶

Thus, the legal position consistent with present-day customary *ius in bello* is that, when an attack is launched, environmental considerations must play a role in the targeting process. Hence, even if an attack is planned in an area with little or no civilian population, it may have to be called off if the harm to the environment is expected to be excessive in relation to the military advantage anticipated.⁷ Conversely, “if the target is sufficiently important, a greater degree of risk to the environment may be justified”.⁸ Once due regard is given to environmental considerations and proportionality is observed, it must be borne in

³ In the course of the Iran-Iraq War, hundreds of oil tankers were attacked by both sides in the Persian Gulf. As a result, in 1984 alone more than 2 million tons of oil were spilled into the sea. See P. Antoine, “International Humanitarian Law and the Protection of the Environment in Time of Armed Conflict”, *Int’l Rev. of the Red Cross* 32 (1992), 517 et seq., (530).

⁴ Advisory Opinion on *Nuclear Weapons*, see note 1, 242 para. 30.

⁵ Cf. article 51 para. 5 lit.(b) of Protocol I, see note 2, 651.

⁶ L. Doswald-Beck, “International Humanitarian Law and the Advisory Opinion of the International Court of Justice on the Legality of the Threat or Use of Nuclear Weapons”, *Int’l Rev. of the Red Cross* 37 (1997), 35 et seq., (52).

⁷ See *ibid.*, *id.*

⁸ International Criminal Tribunal for the Former Yugoslavia (ICTY): Final Report to the Prosecutor by the Committee Established to Review the NATO Bombing Campaign against the Federal Republic of Yugoslavia, 2000, *ILM* 39 (2000), 1257 et seq., (1263).

mind that an attack against a military objective is liable to produce legitimate collateral damage to the environment.⁹

These are the general norms pursuant to customary international law. The question to be discussed in this article is to what degree conventional international law confers upon the natural environment a special protection.

II. The International Legal Texts

We shall not examine here the status during armed conflict of peacetime environmental treaties dealing, e.g., with oil dumping into the ocean or the use of substances that deplete the ozone layer.¹⁰ Nor shall we address the *jus in bello* injunctions against certain weapons the use of which is prohibited in general (whether or not they affect the environment). We shall focus instead on treaties directly apposite to the protection of the environment in warfare.

There are two major international legal instruments (one generated within the framework of the United Nations and the other as part of the "Red Cross law"), and three supplementary texts (all related to the UN).

1. The ENMOD Convention

Article I para. 1 of the Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (adopted by the UN General Assembly in 1976 and opened for signature in 1977; hereinafter: "ENMOD Convention") prescribes:

"Each State Party to this Convention undertakes not to engage in military or any other hostile use of environmental modification

⁹ A.R. Thomas/ L.J.C. Duncan (eds), *Annotated Supplement to the Commander's Handbook on the Law of Naval Operations, International Law Studies* 73 (1999), 405.

¹⁰ On this issue, see E.B. Weiss, "Opening the Door to the Environment and to Future Generations", in: L. Boisson de Chazournes/ P. Sands (eds), *International Law, the International Court of Justice and Nuclear Weapons*, 1999, 338 et seq., (347-348).

techniques having widespread, long-lasting or severe effects as the means of destruction, damage or injury to any other State Party".¹¹

Article II of the ENMOD Convention sets forth:

"As used in Article I, the term "environmental modification techniques" refers to any technique for changing — through the deliberate manipulation of natural processes — the dynamics, composition or structure of the Earth, including its biota, lithosphere, hydrosphere and atmosphere, or of outer space".¹²

An Understanding relating to article II is attached to the ENMOD Convention, listing on an illustrative basis the following phenomena that could be caused by environmental modification techniques: "earthquakes; tsunamis; an upset in the ecological balance of a region; changes in weather patterns (clouds, precipitation, cyclones of various types and tornadic storms); changes in climate patterns; changes in ocean currents; changes in the state of the ozone layer; and changes in the state of the ionosphere".¹³

In conformity with the ENMOD Convention, not every use of an environmental modification technique is forbidden. The combined effect of arts I and II is that several conditions have to be met:

- (i) Only "military or any other hostile" use of an environmental modification technique is forbidden. It does not matter whether resort to an environmental modification technique is made for offensive or defensive purposes.¹⁴ But the proscribed use must be either military or hostile.¹⁵ Article III para. 1 of the ENMOD Convention expressly states:

"The provisions of this Convention shall not hinder the use of environmental modification techniques for peaceful purposes and

¹¹ Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD Convention), 1976, reproduced in: Schindler, see note 2, 163 et seq., (164).

¹² Ibid., 165.

¹³ Ibid., 168.

¹⁴ See J. Muntz, "Environmental Modification", *Harv. Int'l L. J.* 19 (1978), 385 et seq., (388).

¹⁵ "Military" and "hostile" do not necessarily overlap. On the difference between the two adjectives, see C.R. Wunsch, "The Environmental Modification Treaty", *ASILS International Law Journal* 4 (1980), 113 et seq., (126).

shall be without prejudice to the generally recognized principles and applicable rules of international law concerning such use".¹⁶

It must be perceived that the activities excluded from the prohibition of the ENMOD Convention consist of either:

(a) Benign stimulation of desirable environmental conditions, such as relieving drought-ridden areas or preventing acid rain;¹⁷

or (at the other end of the spectrum):

(b) Measures causing destruction, damage or injury to another state when the use of the environmental modification technique is non-hostile and non-military.¹⁸ As the last part of article III para. 1 clarifies, the ENMOD Convention does not necessarily legitimize such activities (which may be illicit on other international legal grounds),¹⁹ but they do not come within the framework of its prohibition.

(ii) The proscribed action must consist of "manipulation of natural processes". The natural process, then, is the instrument manipulated (as a weapon) for wreaking havoc.

(iii) The prohibited conduct must be "deliberate". Differently put, the manipulation of natural processes must be intentional, and mere collateral damage resulting from an attack against a military objective is not included.²⁰ Consequently, a bombing of a chemicals factory leading to toxic air pollution would not count under the ENMOD Convention.²¹

¹⁶ ENMOD Convention, see note 11, 165.

¹⁷ Cf. H.H. Almond, "The Use of the Environment as an Instrument of War", *Yearbook of International Environmental Law* 2 (1991), 455 et seq., (462).

¹⁸ See M.J.T. Caggiano, "The Legitimacy of Environmental Destruction in Modern Warfare: Customary Substance over Conventional Form", *Boston College Environmental Affairs Law Review* 20 (1992-1993), 479 et seq., (489).

¹⁹ See L. Juda, "Negotiating a Treaty on Environmental Modification Warfare: The Convention on Environmental Warfare and Its Impact upon Arms Control Negotiations", *International Organization* 32 (1978), 975 et seq., (984).

²⁰ See R.G. Tarasofsky, "Legal Protection of the Environment during International Armed Conflict", *NYIL* 24 (1993), 17 et seq., (47).

²¹ See A.P.V. Rogers, *Law on the Battlefield*, 1996, 116.

- (iv) The interdicted action must have “widespread, long-lasting or severe effects” (on the meaning of these crucial terms, see *infra*, III.). Consequently, if such effects are not produced, the use of an environmental modification technique (albeit hostile) would be excluded from the scope of the prohibition.²² By not forbidding a lower-level manipulation of natural processes for hostile purposes, the ENMOD Convention appears to condone military preparations for such activities.²³
- (v) The banned conduct must cause destruction, damage or injury. Three points should be appreciated:
- (a) Not every use of an environmental modification technique for military or hostile purposes must necessarily bring about destruction, damage or injury. For instance, an environmental modification technique employed for the dispersal of fog above critical enemy areas may be harmless as such.²⁴
- (b) Should there be destruction, damage or injury, the victim of the modification technique need not inevitably be the environment itself (although this would be a plausible outcome).²⁵ If a tsunami or an earthquake can be induced by human beings in the future, the likely target would be a major industrial complex or a similar non-environmental objective.
- (c) The destruction, damage or injury must, of course, be generated by a deliberate manipulation of natural processes; but it may go far beyond what was intended or even foreseen by the

²² See L.I. Sánchez Rodríguez, “1977 United Nations Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques”, in: N. Ronzitti (ed.), *The Law of Naval Warfare: A Collection of Agreements and Documents with Commentaries*, 1998, 651 et seq., (664).

²³ See A.H. Westing, “Environmental Warfare”, *Environmental Law* 15 (1984–1985), 645 et seq., (663–664).

²⁴ See J. Goldblat, “The Environmental Modification Convention of 1977: An Analysis”, in: A.H. Westing (ed.), *Environmental Warfare: A Technical, Legal and Policy Appraisal*, 1984, 53 et seq., (54).

²⁵ See W.D. Verwey, “Protection of the Environment in Times of Armed Conflict: In Search of a New Legal Perspective”, *LJIL* 8 (1995), 7 et seq., (17).

acting state.²⁶ This does not matter, as long as there is a causal nexus between the deliberate act and the result.²⁷

- (vi) The destruction, damage or injury must be inflicted on another state party to the ENMOD Convention. It does not matter whether that state is a belligerent or a neutral one, provided that it is a contracting party to the instrument. The destruction, damage or injury does not come within the ambit of the ENMOD Convention if it affects solely –
- (a) The territory of the acting state (i.e. when the victim is the state's own population).²⁸
 - (b) The territory of a state not party to the ENMOD Convention. Proposals at the time of drafting to make the text applicable *erga omnes* failed.²⁹ Similar proposals did not carry the day in a Review Conference held in 1984.³⁰
 - (c) Areas outside the jurisdiction of all states, like the high seas.³¹ Unless, of course, the destructive activities on the high seas affect the shipping of a state party to the ENMOD Convention.³²

²⁶ See F.J. Yuzon, "Deliberate Environmental Modification through the Use of Chemical and Biological Weapons: 'Greening' the International Laws of Armed Conflict to Establish an Environmentally Protective Regime", *Am. U. J. Int'l L. & Pol'y* 11 (1995–1996), 793 et seq., (807).

²⁷ See A. Leibler, "Deliberate Wartime Environmental Damage: New Challenges for International Law", *Cal. W. Int'l L. J.* 23 (1992–1993), 67 et seq., (83).

²⁸ See S.N. Simonds, "Conventional Warfare and Environmental Protection: A Proposal for International Legal Reform", *Stanford J. Int'l L.* 29 (1992–1993), 165 et seq., (187).

²⁹ See G. Fischer, "Le Convention sur l'Interdiction d'Utiliser des Techniques de Modification de l'Environnement à des Fins Hostiles", *AFDI* 23 (1977), 820 et seq., (830–831).

³⁰ See K. Korhonen, "The ENMOD Review Conference: The First Review Conference of the ENMOD Convention", *Disarmament* 8 (1985), 133 et seq., (137).

³¹ See W. Heintschel von Heinegg/ M. Donner, "New Developments in the Protection of the Natural Environment in Naval Armed Conflicts", *GYIL* 37 (1994), 281 et seq., (294–295, 308).

³² See G.K. Walker, *The Tanker War, 1980–88: Law and Policy, International Law Studies* 74 (2000), 514.

Exceptionally, environmental modifications can be spawned by conventional means and methods of warfare. A hypothetical example would be the systematic destruction by fire of the rain forests of the Amazon River Basin, thereby inducing a global climatic change.³³ But by and large, the phenomena catalogued illustratively in article II (man-induced earthquakes, tsunamis and suchlike measures) can only be accomplished with unconventional weapons. For the most part, these techniques do not even reflect existing capabilities,³⁴ and they are therefore future-oriented. Weather manipulation through "cloud seeding" has already been attempted, albeit not with spectacular results.³⁵

Since, as indicated, the framers of the ENMOD Convention decided that its application should be circumscribed to the relations between states parties, it is manifest that they deemed the text innovative (rather than declaratory of customary international law). Nothing has happened since the adoption of the ENMOD Convention to suggest that the legal position has changed in this regard.

2. Protocol Additional to the Geneva Conventions of 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol I)

This Protocol deals with the issue of the environment twice. Article 35 para. 3 proclaims the basic rule:

"It is prohibited to employ methods or means of warfare which are intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment".³⁶

Article 55 para. 1 goes on to state:

"Care shall be taken in warfare to protect the natural environment against widespread, long-term and severe damage. This protection includes a prohibition of the use of methods or means of warfare which are intended or may be expected to cause such damage to the

³³ See Rogers, see note 21, 110.

³⁴ See W. Heintschel von Heinegg, "The Law of Armed Conflicts at Sea", in: D. Fleck (ed.), *The Handbook of Humanitarian Law in Armed Conflicts*, 1995, 405 et seq., (423).

³⁵ See H. McCoubrey, *International Humanitarian Law: Modern Developments in the Limitation of Warfare*, 1998, 2nd edition, 229.

³⁶ Protocol I, see note 2, 645.

natural environment and thereby to prejudice the health or survival of the population".³⁷

The first sentence of article 55 para. 1 reflects the underlying concept, to wit, the need to protect the natural environment in warfare, and it is interesting that the word "warfare" is retained in the text: ordinarily it was avoided by the framers of the Protocol (who preferred the phrase "international armed conflict").³⁸ The second sentence in essence replicates article 35 para. 3. However, apart from slight stylistic changes, the second sentence adds the verb "includes" and the rider "thereby to prejudice the health or survival of the population". Both additions are problematic. The first may imply that the prohibition incorporated in article 55 para. 1 is "just an example for the scope of application and not a definition or interpretation of the foregoing sentence".³⁹ Yet, it has never been seriously contended that the protection of the natural environment under article 55 para. 1 breaks any new ground as compared to article 35 para. 3.⁴⁰ By contrast, the second addition to the second sentence of article 55 para. 1 appears to restrict its range to environmental damage that specifically prejudices human health or survival. Apparently, the desire of the framers of the Protocol was to reflect two conflicting standpoints: one advocating the notion that the protection of the environment in wartime is an end in itself (cf. article 35 para. 3), and the other subscribing to the view that the protection is only designed to guarantee the survival or health of human beings (cf. article 55 para. 1).⁴¹ The present writer believes that the best way to construe the Protocol is to read the two additions to the second sentence of article 55 para. 1 as interlinked. By bringing to the fore cases in which damage to the natural environment would prejudice human health or survival, the prohibition in article 55 para. 1 is not reduced to them. The injury to

³⁷ Ibid., 653.

³⁸ See P. Bretton, "Le Problème des 'Méthodes et Moyens de Guerre ou de Combat' dans les Protocoles Additionnels aux Conventions de Genève du 12 Août 1949", *RGDIP* 82 (1978), 32 et seq., (68).

³⁹ E. Rauch, *The Protocol Additional to the Geneva Conventions for the Protection of Victims of International Armed Conflicts and the United Nations Convention on the Law of the Sea: Repercussions on the Law of Naval Warfare*, 1984, 140.

⁴⁰ See Verwey, see note 25, 13.

⁴¹ See G. Herczegh, "La Protection de l'Environnement Naturel et le Droit Humanitaire", in: C. Swinarski (ed.), *Studies and Essays on International Humanitarian Law and Red Cross Principles in Honour of Jean Pictet*, 1984, 725 et seq., (729).

human beings should be regarded not as a condition for the application of the injunction against causing environmental damage, but as the paramount category included within the bounds of a larger injunction.⁴²

Article 55 para. 1 refers to the “health or survival” of the population. It follows that “mere survival of the population” is not enough: when the population’s health is prejudiced, the ban is applicable.⁴³ Unlike many other clauses of the Protocol, article 55 para. 1 employs the expression “population” unaccompanied by the adjective “civilian”. This was a purposeful omission underscoring that the whole population, “without regard to combatant status”, is alluded to.⁴⁴ In any event, the replication of the same prohibition in article 35 para. 3 — forming part of a section of the Protocol related to methods and means of warfare — shows that civilians are not the sole beneficiaries of the protection of the natural environment. Moreover, in light of the condition that the environmental damage be “long-term”, its effects are likely to outlast the war, and then any distinction between civilians and combatants becomes anachronistic.⁴⁵

Some commentators criticize the text of article 55 para. 1 for not elucidating whether the whole population of a country is referred to or only a segment thereof (for instance, those persons who are in the vicinity of a battlefield).⁴⁶ But this is not very persuasive. The Protocol’s interdiction is phrased in a manner accentuating what is “intended” or “may be expected” to occur. The “*may* be expected” formula has also

⁴² H. Blix, “Arms Control Treaties Aimed at Reducing the Military Impact on the Environment”, in: J. Makarczyk (ed.), *Essays in International Law in Honour of Judge Manfred Lachs*, 1984, 703 et seq., (713).

⁴³ See R. Carruthers, “International Controls on the Impact on the Environment of Wartime Operations”, *Environmental and Planning Law Journal* 10 (1993), 38 et seq., (47).

⁴⁴ F. Kalshoven, “Reaffirmation and Development of International Humanitarian Law Applicable in Armed Conflicts: The Diplomatic Conference, Geneva, 1974–1977, Part II”, *NYIL* 9 (1978), 107 et seq., (130–131).

⁴⁵ See A. Kiss, “Les Protocoles Additionnels aux Conventions de Genève et la Protection de Biens de l’Environnement”, in: Swinarski, see note 41, 181 et seq., (190).

⁴⁶ See G.B. Roberts, “The New Rules for Waging War: The Case against Ratification of Additional Protocol I”, *Va. J. Int’l L.* 26 (1985–1986), 109 et seq., (148 note 213).

been disparaged.⁴⁷ Still, what the text does is accentuate prognostication (in the sense of both premeditation and foreseeability) rather than results. Hence:

- (i) On the one hand, "mere inadvertent collateral environmental effect of an attack" does not come within the compass of the prohibition.⁴⁸ As long as the damage to the natural environment (and the consequential prejudice to the health and survival of the population) is neither intended nor expected, no breach of the Protocol occurs.
- (ii) On the other hand, where such an intention or expectation exists, it is immaterial that in fact only a portion of the population has been adversely affected. Indeed, if the intention or expectation can be established, it does not matter if ultimately there are no victims at all (although, in the absence of any damage, there may be insuperable obstacles in proving the intention or the expectation).⁴⁹ After all, the text posits "prejudice" to health or survival of the population, not actual injury.

Although article 55 para. 1 does not expressly designate the natural environment as a civilian object,⁵⁰ it is noteworthy that the clause features in a Chapter of the Protocol entitled "Civilian Objects".⁵¹ In comparison to civilian objects in general, the natural environment is granted special protection (jointly with cultural objects and places of worship, objects indispensable to the survival of the civilian population, and works and installations containing dangerous forces). But the point is that, once classified as a civilian object, the natural environment must not be the object of attack.⁵²

⁴⁷ See W.A. Wilcox, "Environmental Protection in Combat", *Southern Illinois University Law Journal* 17 (1992-1993), 299 et seq., (308, 313).

⁴⁸ M. Bothe, "War and Environment", in: R. Bernhardt (ed.), *EPIL* 4 (2000), 1342 et seq., (1344).

⁴⁹ See Rogers, see note 21, 113.

⁵⁰ See B. Baker, "Legal Protections for the Environment in Times of Armed Conflict", *Va. J. Int'l L.* 33 (1992-1993), 351 et seq., (364).

⁵¹ Protocol I, see note 2, 652 (Chapter III of Part IV, Section I).

⁵² See article 52 para. 1 of Protocol I, *ibid.*, *id.* The treatment of the environment as a civilian object has been criticized for being too anthropocentric by K. Hulme, "Armed Conflict, Wanton Ecological Devastation and Scorched Earth Policies: How the 1990-91 Gulf Conflict Revealed the Inadequacies of the Current Laws to Ensure Effective Protection and Preservation of the Natural Environment", *Journal of Armed Conflict Law* 2

This general observation is subject to an important caveat. Whereas it is correct to say that the natural environment in its plenitude must not be the object of attack, the legal status of specific elements of the environment would depend on changing circumstances. A forest, for instance, can become a military objective owing to enemy use (especially for concealment purposes) or even due to its strategic location (as in a mountain pass).⁵³ If so, it would be exposed to attack.

Article 55 para. 1 appears in a Section of the Protocol, which affects the civilian population, individual civilians and civilian objects on land only (even if attacked from the sea or from the air).⁵⁴ The exclusion of naval and air warfare (not affecting land) from the reach of article 55 para. 1 is emphasized by some scholars.⁵⁵ But considering that article 35 para. 3 is not similarly circumscribed, it appears clear that the Protocol's protection of the natural environment applies to all types of warfare.

The Protocol does not define the phrase "natural environment". The ICRC Commentary suggests that it "should be understood in the widest sense to cover the biological environment in which a population is living" — i.e. the fauna and flora — as well as "climatic elements".⁵⁶

There is no doubt that arts 35 para. 3 and 55 para. 1 constituted an innovation in international humanitarian law at the time of their adoption.⁵⁷ It is sometimes alleged that the provisions have in the meantime been accepted as part and parcel of customary international law.⁵⁸ But this is wrong. As late as 1996, the ICJ — in the above mentioned *Nuclear Weapons Advisory Opinion* — enunciated that the provisions of the Protocol "provide additional protection for the environment" and

(1997), 45 et seq., (59). But the criticism misses the point: a civilian object is an object which in principle is immune from attack.

⁵³ Cf. M. Bothe, "The Protection of the Environment in Times of Armed Conflict", *GYIL* 34 (1991), 54 et seq., (55). Cf. also the definition of military objectives, see note 2.

⁵⁴ Protocol I, see note 2, 650 (article 49 para. 3).

⁵⁵ See Walker, see note 32, 517–518.

⁵⁶ C. Pilloud/ J. Pictet, "Article 55", in: Y. Sandoz et al. (eds), *Commentary on the Additional Protocols of 8 June 1977 to the Geneva Conventions of 12 August 1949*, 1987, 661 et seq., (662).

⁵⁷ See C. Greenwood, "Customary International Law and the First Geneva Protocol of 1977 in the Gulf Conflict", in: P. Rowe (ed.), *The Gulf War 1990–91 in International and English Law*, 1993, 63 et seq., (86).

⁵⁸ See, e.g., S. Gupta, "Iraq's Environmental Warfare in the Persian Gulf", *Geo. Int'l. Envtl. L. Rev.* 6 (1993–1994), 251 et seq., (260).

"[t]hese are powerful constraints for all the States having subscribed to these provisions".⁵⁹ Surely, states which have not subscribed to the provisions (by becoming contracting parties to the Protocol) are not bound by these constraints.⁶⁰ In other words, the relevant Protocol's clauses have not yet crystallized as customary international law. In 2000, the Committee Established to Review the NATO Bombing Campaign against the Federal Republic of Yugoslavia opined that article 55 "may" reflect current customary law, while noting that "the International Court of Justice appeared to suggest that it does not".⁶¹

3. Supplementary Texts

a. The Rome Statute

Article 8 para. 2 lit.b (iv) of the 1998 Rome Statute of the International Criminal Court stigmatizes as a war crime –

"Intentionally launching an attack in the knowledge that such attack will cause incidental loss of life or injury to civilians or damage to civilian objects or widespread, long-term and severe damage to the natural environment which would be clearly excessive in relation to concrete and direct overall military advantage anticipated".⁶²

This text is based on the language of the Protocol, but there are two significant modifications as regards the protection of the environment: (i) the Statute requires both intention and knowledge of the outcome, rather than either intention or expectation as set forth in the Protocol; and (ii) for the war crime to crystallize, the damage to the natural environment must be clearly excessive in relation to the military advantage anticipated. The first modification is warranted by the labelling of the

⁵⁹ Advisory Opinion on *Nuclear Weapons*, see note 1, 242.

⁶⁰ Some scholars, relying on the Court's words that the Protocol's provisions "embody a general obligation" (*ibid.*, *id.*), arrive at the conclusion that this is an implied recognition of customary international law; see T. Maruhn, "Environmental Damage in Times of Armed Conflict – Not 'Really' a Matter of Criminal Responsibility", *Int'l Rev. of the Red Cross* 82 (2000), 1029 et seq., (1031). But such conclusion misses the pivotal reference to states which have subscribed to these provisions.

⁶¹ Final Report to the Prosecutor by the Committee, see note 8, 1262.

⁶² Rome Statute of the International Criminal Court, 1998, *ILM* 37 (1998), 999 et seq., (1006).

act as a war crime, namely, the establishment of individual criminal responsibility and liability for punishment. Only an individual acting with both knowledge and intent would have the necessary *mens rea* exposing him to penal sanctions.⁶³ The second modification is derived from the amalgamation in one paragraph of the *materia* of the protection of civilians (or civilian objects) and that of the natural environment. The principle of proportionality has already been mentioned (*supra*, I.): a balance must be struck between the military advantage anticipated (from an attack against a military objective) and any incidental injury to civilians or civilian objects. This is true also of the natural environment as a civilian object (unless an element of the environment — like a forest — is deemed a military objective in the circumstances prevailing at the time⁶⁴). But the special regime, set up for the protection of the natural environment in arts 35 para. 3 and 55 para. 1 of the Protocol, brings in the three cumulative conditions of “widespread, long-term and severe damage” in lieu of proportionality. Under the Protocol, no action in warfare is allowed to reach the threshold of “widespread, long-term and severe damage” to the natural environment, irrespective of any other considerations.⁶⁵ Should the three cumulative criteria be satisfied, the action will be in breach of the Protocol even if it is “clearly proportional”.⁶⁶ This is not the case in the Rome Statute where damage to the environment (however “widespread, long-term and severe”) is explicitly added “as an element in the proportionality equation”.⁶⁷

⁶³ See M.A. Drumbl, “Waging War against the World: The Need to Move from War Crimes to Environmental Crimes”, *Fordham Int’l L. J.* 22 (1998–1999), 122 et seq., (126, 130–131).

⁶⁴ See D. Fleck, “Legal and Policy Perspectives”, in: H. Fox/ M.A. Meyer (eds), *Effecting Compliance*, 1993, 143 et seq., (146).

⁶⁵ See P.J. Richards/ M.N. Schmitt, “Mars Meets Mother Nature: Protecting the Environment during Armed Conflict”, *Stetson Law Review* 28 (1998–1999), 1047 et seq., (1061–1062).

⁶⁶ See M.N. Schmitt, “The Environmental Law of War: An Invitation to Critical Reexamination”, *Rev. Dr. Mil. Dr. Guerre* 36 (1997), 11 et seq., (35).

⁶⁷ W.J. Fenrick, “Article 8(2)(b)(iv)”, in: O. Triffterer (ed.), *Commentary on the Rome Statute of the International Criminal Court*, 1999, 197 et seq., (id.).

b. Protocol III, Annexed to the Weapons Convention

The Preamble of the 1980 Convention on Prohibitions or Restrictions of the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects repeats verbatim (by "recalling") the text of arts 35 para. 3 of Protocol I (without citing the source).⁶⁸ Article 2 para. 4 of Protocol III, annexed to the Convention, lays down:

"It is prohibited to make forests or other kinds of plant cover the object of attack by incendiary weapons except when such natural elements are used to cover, conceal or camouflage combatants or other military objectives, or are themselves military objectives".⁶⁹

This provision is, of course, very limited in scope. It relates to only a small part of the natural environment: forests or other kinds of plant cover. Also, it grants protection not against attacks in general, but only against attacks by specific (incendiary) weapons. And the protection ceases when the enemy is using the forests for cover, concealment or camouflage; or when they constitute military objectives. In reality, "plant cover is most likely to be attacked precisely when it is being used as cover or camouflage".⁷⁰ It has therefore been contended that the provision has little or no practical significance.⁷¹ But the protection of civilians or civilian objects in general is contingent on non-abuse, and there is no reason to protect a forest from attack when the enemy is conducting military operations under cover. The reference in the text to forests as military objectives presumably relates either to their actual use by the enemy or to their strategic location (see *supra*, II. 2.). Protocol III is not accepted as customary international law.⁷²

⁶⁸ Convention on Prohibitions or Restrictions of the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects, 1980, reproduced in: Schindler, see note 2, 179 et seq., (id.).

⁶⁹ Protocol on Prohibitions or Restrictions on the Use of Incendiary Weapons (Protocol III), 1980, *ibid.*, 190 et seq., (191).

⁷⁰ J. Goldblat, "Legal Protection of the Environment against the Effects of Military Activities", *Bulletin of Peace Proposals* 22 (1991), 399 et seq., (403).

⁷¹ See F. Kalshoven, *Constraints on the Waging of War*, 1987, 157.

⁷² B.A. Harlow/ M.E. McGregor, "International Environmental Law Considerations during Military Operations Other than War", in: R.J. Grunawalt et al. (eds), *Protection of the Environment during Armed Conflict, International Law Studies* 69 (1996), 315 et seq., (318).

c. The Chemical Weapons Convention

The use of herbicides (chemicals defoliants) for military purposes — primarily, in order to deny the enemy sanctuary and freedom of movement in dense forests — caught wide attention during the Vietnam War, owing to the magnitude of American herbicide operations and the fact that they stretched over a long period of time.⁷³ The United States conceded that resort to herbicides can come within the purview of the prohibition of the ENMOD Convention, but only if it upsets the ecological balance of a region.⁷⁴ Even this proposition has been challenged on the ground that recourse to herbicides, albeit destructive of an element of the environment, does not amount to a “manipulation of natural processes”.⁷⁵ However, the interpretation that the use of herbicides can under certain conditions “be equated with environmental modification techniques under Article II of the Convention” was authoritatively reaffirmed in a Review Conference in 1992.⁷⁶ Evidently, the conditions listed in article I para. 1 of the ENMOD Convention must not be ignored. In particular, “widespread, long-lasting or severe” environmental damage is a prerequisite. A sporadic spread of herbicides might not cause environmental damage that is “widespread, long-lasting or severe”, in which case it would not be in breach of the ENMOD Convention.

It is therefore significant that the 1993 Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction (CWC) states in its 7th preambular paragraph:

⁷³ See A.H. Westing, “Herbicides in War: Past and Present”, in: A.H. Westing (ed.), *Herbicides in War: The Long-Term Ecological and Human Consequences*, 1984, 3 et seq., (5).

⁷⁴ See J. Goldblat, “The Environmental Modification Convention: A Critical Review”, *HuV* 6 (1993), 81 et seq., (82).

⁷⁵ See J.G. Dalton, “The Environmental Modification Convention: An Unassuming but Focused and Useful Convention”, *HuV* 6 (1993), 140 et seq., (142).

⁷⁶ A. Bouvier, “Recent Studies on the Protection of the Environment in Time of Armed Conflict”, *Int’l Rev. of the Red Cross* 32 (1992), 554 et seq., (563).

“Recognizing the prohibition, embodied in the pertinent agreements and relevant principles of international law, of the use of herbicides as a method of warfare”.⁷⁷

This paragraph was part of a “compromise package”, whereby herbicides were simultaneously omitted from the definition of banned chemical weapons in the operative clauses of the CWC.⁷⁸ Interestingly, the United States — although considering the CWC’s prohibitions to be inapplicable to herbicides — “has formally renounced the first use of herbicides in time of armed conflict” (except within US installations or around their defensive perimeters).⁷⁹

The allusion in the Preamble of the CWC to “the pertinent agreements” is somewhat vague, but it seems that the framers had in mind both the ENMOD Convention and Protocol I.⁸⁰ Of greater weight is the reference to the “relevant principles of international law” and the use of the expression “[r]ecognizing”. The inescapable connotation is that the prohibition is now predicated on customary international law.

III. The Dissimilarities between the ENMOD Convention and Protocol I

It is worth recalling that the ENMOD Convention and Protocol I — although negotiated separately (the former in the context of the UN and the other as part of the process of updating the Geneva “Red Cross” Conventions) — were both signed in 1977. Needless to say, the framers of each text were fully cognizant of the other. The two instruments were designed to achieve different purposes, and there is no overlap in substance.

⁷⁷ Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction, 1993, *ILM* 32 (1993), 800 et seq., (804).

⁷⁸ W. Krutzsch/ R. Trapp, *A Commentary on the Chemical Weapons Convention*, 1994, 8, 30.

⁷⁹ *Annotated Supplement to the Commander’s Handbook on the Law of Naval Operations*, see note 9, 477.

⁸⁰ See A. Gioia, “The Chemical Weapons Convention and Its Application in Time of Armed Conflict”, in: M. Bothe/ N. Ronzitti/ A. Rosas (eds), *The New Chemical Weapons Convention – Implementation and Prospects*, 1998, 379 et seq., (387).

In its temporal sphere of application, Protocol I is narrower in scope than the ENMOD Convention. Although Protocol I draws no distinction between enemy territory and the territory of the belligerent causing the environmental damage,⁸¹ the instrument applies only to international armed conflicts.⁸² The counterpart instrument governing non-international armed conflicts — Protocol II⁸³ — does not incorporate a provision parallel to arts 35 para. 3 and 55 para. 1.⁸⁴ For its part, the ENMOD Convention is germane to any situation in which an environmental modification technique is deliberately resorted to for military or hostile purposes and inflicts sufficient injury on another state party. The phraseology would cover the case of a hostile use of an environmental modification technique in the course of a non-international armed conflict, where the weapon is wielded intentionally against a domestic foe but causes cross-border environmental damage to another state party.⁸⁵

Where weaponry is concerned, the Protocol has a wider scope than the ENMOD Convention. Whereas the ENMOD Convention is confined to one single type of weaponry, i.e. an environmental modification technique, the Protocol protects the natural environment (within prescribed circumstances) — and the population — against damage inflicted by any weapon whatsoever.⁸⁶ This can be looked at from an additional angle. In its thrust, the Protocol protects the environment (“the environment as victim”), whereas the ENMOD Convention protects from manipulation of the environment (“the environment as weapon”).⁸⁷

The Protocol goes much further than the ENMOD Convention in protecting the natural environment not only against intentional (or

⁸¹ See C. Stannard, “Legal Protection of the Environment in Wartime”, *Sydney Law Review* 14 (1992), 373 et seq., (375).

⁸² Article 1 para. 3 of Protocol I, see note 2, 628. But see also article 1 para. 4, *ibid.*, id.

⁸³ Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of Non-International Armed Conflicts (Protocol II), 1977, reproduced in: Schindler, see note 2, 689.

⁸⁴ See M. Sassòli/ A.A. Bouvier, *How Does Law Protect in War: Cases, Documents, and Teaching Materials on Contemporary Practice in International Humanitarian Law*, 1999, 437.

⁸⁵ See Fischer, see note 29, 830.

⁸⁶ J. de Preux, “Article 35”, in: Sandoz, see note 56, 389 et seq., (414–415).

⁸⁷ Bothe, see note 53, 57.

“deliberate”) infliction of damage in the course of warfare, but also against “purely unintentional and incidental damage” which, however, can be “expected”.⁸⁸ The Protocol accordingly provides protection also against “non-intentional ecological war”, provided that the consequences for the natural environment are foreseeable.⁸⁹

Neither the Protocol nor the ENMOD Convention applies in every case of destruction or damage. A threshold is set up in the two instruments, and remarkably both use the same (or virtually the same) qualifying adjectives: “widespread”, “long-term” (or “long-lasting”) and “severe”. This ostensible resemblance between the two texts is deceptive for the following reasons:

- (i) In the ENMOD Convention the three terms are enumerated alternatively (“widespread, long-lasting *or* severe effects”), whereas in the Protocol they are listed cumulatively (“widespread, long-term *and* severe”). Thus, under the ENMOD Convention suffice it for one of the three yardsticks to be met, but under the Protocol all three conditions must be satisfied concurrently.⁹⁰ Since environmental damage often meets one or even two of the conditions yet not the third, the Protocol sets a barrier which may prove too high⁹¹ (see *infra*, IV.).
- (ii) The three conditions, whether conjunctive or disjunctive, govern the scope of area affected, duration and degree of damage.⁹² But the ENMOD Convention and the Protocol “attribute different meanings to identical terms”.⁹³ In conformity with an Understanding relating to article I, attached to the ENMOD Conven-

⁸⁸ See S. Oeter, “Methods and Means of Combat”, in: Fleck, see note 34, 105 et seq., (117).

⁸⁹ De Preux, see note 86, 419.

⁹⁰ See *ibid.*, 418.

⁹¹ Schmitt gives as an example of “the destruction of all members of a species which occupies a limited region”: this would be long-term and severe (since it is irreversible) but perhaps not widespread. M.N. Schmitt, “War and the Environment: Fault Lines in the Prescriptive Landscape”, *AVR* 37 (1999), 25 et seq., (43–44).

⁹² See W.A. Solf, “Article 55”, in: M. Bothe/ K.J. Partsch/ W.A. Solf (eds.), *New Rules for Victims of Armed Conflicts: Commentary on the Two 1977 Protocols Additional to the Geneva Conventions of 1949*, 1982, 343 et seq., (346).

⁹³ A. Bouvier, “Protection of the Natural Environment in Time of Armed Conflict”, *Int’l Rev. of the Red Cross* 31 (1991), 567 et seq., (575–576).

tion, "widespread" encompasses "an area on the scale of several hundred square kilometres"; "long-lasting" endures "for a period of months, or approximately a season"; and "severe" involves "serious or significant disruption or harm to human life, natural and economic resources or other assets".⁹⁴ The first two criteria, defined in quantitative terms, are clear enough; the third is more ambiguous.⁹⁵ In any event, the Understanding explicitly states that its definitions are intended "exclusively" for the ENMOD Convention and they do not "prejudice the interpretation of the same or similar terms" when used in any other agreement.⁹⁶ The Understanding's definitions are therefore inapplicable to the Protocol where the position is radically divergent.⁹⁷ The meaning of the adjective "severe" in the Protocol is not sufficiently clear.⁹⁸ However, it is accepted that the extent of "widespread" may well be less than several hundred square kilometres.⁹⁹ Above all, "the time scales are not the same": while in the ENMOD Convention "long-lasting" effects are counted in months, "for the Protocol 'long-term' was interpreted as a matter of decades".¹⁰⁰ Where injury to the health of the population is concerned, it is discerned that - since short-term effects are beyond the ambit of the prohibition - what is meant is acts causing, e.g., "congenital defects, degenerations or

⁹⁴ ENMOD Convention, see note 11, 168.

⁹⁵ See A.S. Krass, "The Environmental Modification Convention of 1977: The Question of Verification", in: Westing, see note 24, 65 et seq., (67).

⁹⁶ ENMOD Convention, see note 11, 168.

⁹⁷ Some commentators hold that the definitions in the Understanding attached to the ENMOD Convention are applicable also to the Protocol. See, e.g., B.K. Schafer, "The Relationship between the International Laws of Armed Conflict and Environmental Protection: The Need to Re-evaluate What Types of Conduct Are Permissible during Hostilities", *Cal. W. Intl'L. J.* 19 (1988-1989), 287 et seq., (309 note 110). But the claim is untenable.

⁹⁸ It has been suggested that "severe" in the Protocol means "causing death, ill-health or loss of sustenance to thousands of people, at present or in the future", Leibler, see note 27, 111.

⁹⁹ See Antoine, see note 3, 526.

¹⁰⁰ De Preux, see note 86, 416-417.

deformities".¹⁰¹ The trouble is that it is impracticable to calculate in advance the likely durability of environmental damage.¹⁰²

IV. A Case Study: Setting Fire to Oil Wells in the Gulf War

During the Gulf War, Iraq maliciously released large quantities of oil into the Persian Gulf by opening the valves of oil terminals, causing "the largest oil spill ever".¹⁰³ Above all, in February 1991, it set on fire more than 600 Kuwaiti oil wells (damaging numerous others), casting a huge smoke plume over a huge area.¹⁰⁴ The smoke had serious cross-border effects regionally (although not globally, as initially feared), and the heavy atmospheric pollution in Kuwait had adverse effects for a long time.¹⁰⁵ The oil wells continued to blaze for months, and the last fire was extinguished only in November 1991.

As a rule, oil wells may be regarded as military objectives, the use of which can legitimately be denied to the enemy.¹⁰⁶ Still, considering that the oil wells set on fire by Iraq were located in an occupied country (Kuwait) being evacuated by a defeated army, their systematic destruction — which could not possibly affect the progress of the war — did not offer a definite military advantage in the circumstances ruling at the time. The only possible military advantage to Iraq (on a purely tactical level) was the creation of thick smoke obscuring its ground forces from view by Coalition aviators, but the measure had little impact on mili-

¹⁰¹ Pilloud/ Pictet, see note 56, 663–664.

¹⁰² See G. Plant, "Environmental Damage and the Laws of War: Points Addressed to Military Lawyers", in: Fox, see note 64, 159 et seq., (169).

¹⁰³ A. Roberts, "Environmental Issues in International Armed Conflict: The Experience of the 1991 Gulf War", in: Grunawalt, see note 72, 222 et seq., (247). For a legal analysis of the Iraqi action, see C.C. Joyner/ J.T. Kirkhope, "The Persian Gulf War Oil Spill: Reassessing the Law of Environmental Protection and the Law of Armed Conflict", *Case W. Res. J. Int'l L.* 24 (1992), 29 et seq.

¹⁰⁴ See Roberts, *ibid.*, 248.

¹⁰⁵ See *ibid.*, 250.

¹⁰⁶ See L.C. Green, "The Environment and the Law of Conventional Warfare", *CYIL* 29 (1991), 222 et seq., (233).

tary operations.¹⁰⁷ Even if the oil wells constituted military objectives in the circumstances prevailing at the time, and there was a limited military advantage in the smoke screen reducing visibility, the Iraqi action was subject to the application of the principle of proportionality.¹⁰⁸ The monstrous air pollution throughout Kuwait was tantamount to excessive injury to the environment and to the civilian population in breach of that principle. On balance, the Iraqis appear to have been motivated not by military considerations but by sheer vindictiveness.¹⁰⁹

In the absence of a military rationale, the Iraqi conduct was in violation of several humanitarian norms of general application. Article 23 lit.(g) of the 1899 Convention (II) and 1907 Convention (IV) Respecting the Laws and Customs of War on Land prohibit the destruction of enemy property when not "imperatively demanded by the necessities of war".¹¹⁰ Article 53 of Geneva Convention (IV) of 1949 Relative to the Protection of Civilian Persons in Time of War forbids the destruction by an Occupying Power of (private or public) property in an occupied territory, "except where such destruction is rendered absolutely necessary by military operations".¹¹¹ Under article 147 of the same Convention, an "extensive destruction ... of property, not justified by military necessity and carried out unlawfully and wantonly" is defined as a grave breach.¹¹² If a grave breach was perpetrated, it constituted a war crime under article 8 para. 2 lit.(a) (iv) of the (subsequently crafted) Rome Statute of the International Criminal Court.¹¹³

¹⁰⁷ See J.P. Edwards, "The Iraqi Oil 'Weapon' in the 1991 Gulf War: A Law of Armed Conflict Analysis", *Naval Law Review* 40 (1992), 105 et seq., (121).

¹⁰⁸ See J.H. McNeill, "Protection of the Environment in Time of Armed Conflict: Environmental Protection in Military Practice", in: Grunawalt, see note 72, 536 et seq., (541).

¹⁰⁹ See *ibid.*, *id.*

¹¹⁰ Hague Regulations Respecting the Laws and Customs of War on Land, Annexed to 1899 Hague Convention (II) and 1907 Hague Convention (IV) Respecting the Laws and Customs of War on Land, reproduced in: Schindler, see note 2, 63 et seq., (83).

¹¹¹ Geneva Convention (IV) Relative to the Protection of Civilian Persons in Time of War, 1949, reproduced in: Schindler, see note 2, 495 et seq., (517). On the linguistic difference between "the necessities of war" (the Hague wording) and "military operations" (the Geneva version), see R.J. Zedalis, "Burning of the Kuwaiti Oilfields and the Laws of War", *Vand. J. Transnat'l L.* 24 (1991), 711 et seq., (749-750).

¹¹² Geneva Convention (IV), *ibid.*, 547.

¹¹³ Rome Statute, see note 62, 1006.

In 1992, the General Assembly adopted without vote Resolution 47/37 on the "Protection of the Environment in Times of Armed Conflict", where it is stressed that –

“destruction of the environment, not justified by military necessity and carried out wantonly, is clearly contrary to existing international law”.¹¹⁴

In its *Nuclear Weapons Advisory Opinion*, the ICJ cited this passage.¹¹⁵ The Court noted that General Assembly resolutions are not binding as such, but added that they can “provide evidence important for establishing the existence of a rule or the emergence of an *opinio juris*”.¹¹⁶ The prohibition of damage or destruction to the natural environment, “not justified by military necessity and carried out wantonly”, is reiterated in the San Remo Manual of 1995 on International Law Applicable to Armed Conflicts at Sea.¹¹⁷ This is an accurate reflection of customary international law today.¹¹⁸

The most intriguing question is whether — by setting fire to the Kuwaiti oil wells — Iraq acted in breach of Protocol I and the ENMOD Convention. The simple answer is negative, since Iraq was not a contracting party to the two instruments and they do not reflect customary international law. It is nevertheless worthwhile to raise the issue of principle whether (had Iraq been a contracting party) the action taken would have run counter to the strictures imposed by the two instruments.

As far as Protocol I is concerned, the pivotal problem is the requirement to fulfill the three cumulative conditions of “widespread, long-term and severe damage” to the natural environment. In the immediate aftermath of the Iraqi action, it was almost taken for granted that all three conditions were actually met in this egregious instance.¹¹⁹

¹¹⁴ General Assembly Resolution 47/37, reproduced in: *UNYB* 46 (1992), 991, id.

¹¹⁵ Advisory Opinion on *Nuclear Weapons*, see note 1, 242.

¹¹⁶ *Ibid.*, 254–255.

¹¹⁷ L. Doswald-Beck (ed.), *San Remo Manual on International Law Applicable to Armed Conflicts at Sea*, 1995, 119.

¹¹⁸ See D. Momtaz, “Le Recours à l’Arme Nucléaire et la Protection de l’Environnement: L’Apport de la Cour Internationale de Justice”, in: Boisson de Chazournes, see note 10, 355 et seq., (364–365).

¹¹⁹ P. Fauteux, “L’Utilisation de l’Environnement comme Instrument de Guerre au Koweït Occupé”, in: B. Stern (ed.), *Les Aspects Juridiques de la Crise et de la Guerre du Golfe*, 1991, 227 et seq., (260–262); D. Momtaz,

But since then many scholars have adhered to the view that — while the damage caused by Iraq was undeniably widespread and severe — the “long-term” test (measured in decades) was not satisfied.¹²⁰ This was also the conclusion arrived at officially by the U.S. Department of Defense in reviewing the Gulf War.¹²¹

The position may be different as regards the ENMOD Convention. Although not required to be satisfied cumulatively, all three conditions of “widespread, long-lasting or severe effects” (as construed in the Understanding accompanying article I) were met, bearing in mind that even “long-lasting” is measured here only in months.¹²² As for the Understanding attached to article II (apart from the fact that the catalogue of phenomena listed there is not exhaustive), it covers changes in weather patterns, which definitely occurred in Kuwait.¹²³

The relative primitiveness of the means employed by Iraq should not by itself rule out the applicability of the ENMOD Convention. After all, “arson falls within Article II’s notion of ‘any technique’”,¹²⁴ and as pointed out (*supra*, II. 1.) setting fire to the tropical rain forests would qualify as such a technique. It has been maintained that, inasmuch as Iraq exploded man-made installations (the well-heads) to produce the results, there was no “deliberate manipulation of natural processes”.¹²⁵ The rationale is that “[t]he direct cause of the environmental destruction was the detonation of explosives on the well-heads, and the

“Les Règles relatives à la Protection de l’Environnement au cours des Conflits Armés à l’Epreuve du Conflit entre l’Irak et le Koweït”, *AFDI* 37 (1991), 203 et seq., (209–211).

¹²⁰ See Rogers, see note 21, 124.

¹²¹ United States: Department of Defense Report to Congress on the Conduct of the Persian Gulf War – Appendix on the Role of the Law of War, *ILM* 31 (1992), 612 et seq., (636–637).

¹²² See M.A. Ross, “Environmental Warfare and the Persian Gulf War: Possible Remedies to Combat Intentional Destruction of the Environment”, *Dick J. Int’l. L.* 10 (1991–1992), 515 et seq., (531).

¹²³ See M.T. Okorodudu-Fubara, “Oil in the Persian Gulf War: Legal Appraisal of an Environmental Warfare”, *St. Mary’s Law Journal* 23 (1991–1992), 123 et seq., (176).

¹²⁴ L. Lijnzaad/ G.J. Tanja, “Protection of the Environment in Times of Armed Conflict: The Iraq-Kuwait War”, *NILR* 40 (1993), 169 et seq., (196).

¹²⁵ See L. Edgerton, “Eco-Terrorist Acts during the Persian Gulf War: Is International Law Sufficient to Hold Iraq Liable?”, *Ga. J. Int’l & Comp. L.* 22 (1992), 151 et seq., (172).

fact that those well-heads have been constantly supplied with inflammable oil to feed the fire triggered by those explosions by virtue of the pressures in the strata below them is a secondary, not a causative, matter. Explosives, not oil pressure, were manipulated".¹²⁶ That is to say, this was an instance "of damage to the environment, but not necessarily damage by the forces of the environment".¹²⁷ Yet, the matter is by no means free of doubt. The manipulation of natural forces is frequently brought about through the use of man-made implements. Not surprisingly, a commentator denying that setting the oil wells ablaze is covered by the ENMOD Convention is apt to acknowledge that recourse to incendiary herbicides (such as napalm) is.¹²⁸ Incontestably, Iraq did manipulate the natural pressure of the crude oil underground.¹²⁹ The Iraqis actually "blasted the valves that could normally choke the oil flow to the wellhead".¹³⁰ The sabotage of man-made installations does not detract from the fact that, had it not been for that natural flow under pressure, the "darkness at noon" calamity could not have been contrived by the Iraqis.

The lack of clarity of the language of the ENMOD Convention generated much criticism in 1991, against the background of the Iraqi conduct in the Gulf War. The principal complaint was that the ENMOD Convention highlights unconventional futuristic techniques and ignores damage caused by conventional methods of warfare.¹³¹ However, proposals to revise the text were not adopted in a Review Conference convened in 1992.¹³²

Security Council Resolution 687 (1991) — which set out the cease-fire conditions in the Gulf War — reaffirmed that Iraq "is liable under international law for any direct loss, damage, including environmental

¹²⁶ G. Plant, "Introduction", in: G. Plant (ed.), *Environmental Protection and the Law of War: The 'Fifth Geneva' Convention on the Protection of the Environment in Time of Armed Conflict*, 1992, 3 et seq., (24 note 69).

¹²⁷ Roberts, see note 103, 250.

¹²⁸ See, e.g., N.A.F. Popovic, "Humanitarian Law, Protection of the Environment, and Human Rights", *Geo. Int'l Envtl. L. Rev.* 8 (1995–1996), 67 et seq., (81).

¹²⁹ See N.A. Robinson, "International Law and the Destruction of Nature in the Gulf War", *Environmental Policy and Law* 21 (1991), 216 et seq., (220).

¹³⁰ J.E. Seacor, "Environmental Terrorism: Lessons from the Oil Fires of Kuwait", *Am. U. J. Int'l L. & Pol'y* 10 (1994–1995), 481 et seq., (489).

¹³¹ See Bouvier, see note 76, 561.

¹³² See *ibid.*, 562–563.

damage and the depletion of natural resources, or injury to foreign Governments, nationals and corporations, as a result of Iraq's unlawful invasion and occupation of Kuwait".¹³³ A Compensation Fund (generated by revenues from Iraqi petroleum exports) and a Compensation Commission were established by the Security Council in Resolution 692 (1991).¹³⁴ The Compensation Commission has already awarded Kuwaiti authorities hundreds of millions of dollars for the cost of extinguishing the well-head fires.¹³⁵

Resolution 687 is legally valid despite the triple consideration that (i) Iraq was not a contracting party to Protocol I or to the ENMOD Convention; (ii) the ENMOD Convention does not reflect customary international law, nor do the environmental protection provisions of Protocol I; and (iii) even had the two instruments applied to Iraq, there is no consensus about their legal repercussions. Resolution 687 has a binding effect on Iraq, having been adopted under Chapter VII of the UN Charter.¹³⁶ As for its substance, Resolution 687 predicates "the wrongful act which has engaged Iraq's State responsibility under international law" for any environmental damage on the illegal invasion of Kuwait in breach of the UN Charter and customary international law, rather than on the laws of warfare.¹³⁷ In other words, Iraq's obligation to pay compensation for environmental damage (in conformity with Resolution 687) is derived from a flagrant violation of the *jus ad bellum* and not from any possible breach of the *jus in bello*.¹³⁸

¹³³ Security Council Resolution 687 (1991), reproduced in: *ILM* 30 (1991), 847 et seq., (852).

¹³⁴ Security Council Resolution 692 (1991), reproduced in: *ILM* 30 (1991), 864 et seq., (865).

¹³⁵ See R.P. Alford, "Well Blowout Control Claim", *AJIL* 92 (1998), 287 et seq., (288). The decision is reproduced in: *ILM* 36 (1997), 1343 et seq.

¹³⁶ Security Council Resolution 687, see note 133, 849.

¹³⁷ C. Greenwood, "State Responsibility and Civil Liability for Environmental Damage Caused by Military Operations", in: Grunawalt, see note 72, 397 et seq., (406).

¹³⁸ See L. Low/ D. Hodgkinson, "Compensation for Wartime Environmental Damage: Challenges to International Law after the Gulf War", *Va. J. Int'l L.* 35 (1994-1995), 405 et seq., (456).

V. Conclusion

It is a regrettable fact that customary international law has not yet developed to the point where adequate protection is provided for the environment in wartime. The treaty law is more advanced, but (as demonstrated by the case study of the Gulf War) the threshold set by Protocol I is too high — especially where durability of the environmental damage is concerned — and the ENMOD Convention lends itself to restrictive interpretations. There is no doubt that some intentional and direct damage to the environment is not covered by either the ENMOD Convention or Protocol I, and is consequently still permissible.¹³⁹

A number of scholars have called for a completely new convention, devoted exclusively to the subject and addressing it systematically.¹⁴⁰ However, such a dramatic metamorphosis of the *lex scripta* is not likely at the present juncture. One well-versed commentator, who thought for a while that the formulation of such a treaty was timely,¹⁴¹ has in the meantime concluded that “governments are not at present ready to accept significant new obligations in this field”.¹⁴² Regardless of the advisability of adopting a comprehensive and innovative treaty, what is clearly necessary is putting an end to any current controversy in identifying the threshold of environmental damage amounting to a breach of international law.¹⁴³ This would be a worthwhile goal that could be accomplished by the United Nations.

¹³⁹ See M.D. Diederich, “‘Law of War’ and Ecology – A Proposal for a Workable Approach to Protecting the Environment through the Law of War”, *Military Law Review* 136 (1992), 137et seq., (152).

¹⁴⁰ See G. Plant, “Elements of a ‘Fifth Geneva’ Convention on the Protection of the Environment in Time of Armed Conflict”, in: Plant, see note 126, 37 et seq.

¹⁴¹ See P.C. Szasz, “Environmental Destruction as a Method of Warfare: International Law Applicable to the Gulf War”, *Disarmament* 15 (1992), 128 et seq., (151–153).

¹⁴² P.C. Szasz, “Comment: The Existing Legal Framework, Protecting the Environment during International Armed Conflict”, in: Grunawalt, see note 72, 278 et seq., (280).

¹⁴³ See R.J. Parsons, “The Fight to Save the Planet: U.S. Armed Forces, ‘Greenkeeping’, and Enforcement of the Law Pertaining to Environmental Protection during Armed Conflict”, *Geo. Int’l. Envtl. L. Rev.* 10 (1997–1998), 441 et seq., (460).