

Chapter XIV

Environmental Issues in International Armed Conflict: The Experience of the 1991 Gulf War

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I. INTRODUCTION

This paper's purpose is to survey, and critically examine in the light of events of modern war, legal restraints which bear on environmental damage in international armed conflict.¹ More specifically, the paper addresses the question of whether, and if so how, environmental damage can be prevented or reduced during international armed conflicts and military occupations. Sections II to V of the paper take a general look (not especially related to the 1990-91 Gulf Conflict) at how this and related issues had been addressed before 1990. Sections VI to XI are principally about the events of the Gulf Conflict, including the 1991 Coalition war to liberate Kuwait, the Iraqi destruction of the oil installations, and the tangled aftermath of that war. Section XII discusses issues and conclusions some of which are specific to the events of the 1990-91 Gulf Conflict, and some of which are more general.

Damage to the environment arising from the 1991 Gulf War raised many questions about whether such consequences of war can be effectively prevented or limited, and if so how. This was by no means the first major war to have raised such questions. However, a peculiar conjunction of circumstances meant that it did so in a sharp form. The war happened at a time when there was already great international concern about many environmental issues; it occurred in a region peculiarly rich in oil, a natural resource already notorious for its manifold effects on the environment; its maritime element was largely in an area of sea, the Gulf, which is enclosed and thus especially susceptible to pollution; it saw serious environmental damage—much of it apparently deliberate; and the war was conducted on one side in the name of the United Nations, which has also been deeply involved in various environmental issues. In the wake of the war, there was renewed concern in the international community with the whole question of environmental destruction in war.²

Most, but not all, of the environmental issues were about oil. The oil slicks in the Gulf, the setting on fire of the Kuwaiti oil wells, the Coalition air attacks on

oil installations in Iraq—all seemed to involve, or threaten, damage of several kinds to the natural environment. Other activities in the war also had environmental aspects, including the dumping of quantities of mines and war material in the desert, the bombing of nuclear installations, and the damage to the water supply in Iraq.

It is not my purpose to offer a scientific judgement on the damage to the environment caused by the 1991 Gulf War. It is particularly hard to assess the precise nature and extent of any damage to the natural environments of the earth's atmosphere, the waters of the Gulf, and the land in Kuwait and neighboring regions. Some predictions and preliminary estimates of such damage were made, and are mentioned later in this paper. They reflected disagreement about certain matters, including the extent to which the damage could be expected to be long-term in character. Further studies will certainly follow. There will then be additional questions to be examined: not least, to consider the extent to which the environmental effects of the war have in turn led to human suffering and death, threats to wildlife, damage to crops, and so on. Such studies will be one necessary aspect of any concerted international effort to consider what is to be done about the environmental consequences of war.

What is not in dispute is that the conspicuous damage to the immediate environments of Iraq and Kuwait was, at least in the short term, serious. Kuwait itself was left by the retreating Iraqis an environmental disaster area on land, sea and air. Much of this damage involved a wanton waste of a precious natural resource, namely oil; and proved very difficult and expensive to counter. In Iraq, the damage affecting such public services as sewerage and water purification created a threat to the water supply and other man-made services, and thus to the population at large. Beyond these two countries most directly involved in war, the environmental threats of oil slicks and smoke clouds moved across frontiers to wherever the currents and winds took them. They caused damage to waters and on land in neutral States, especially Iran.

Concern about the environmental consequences of war is not necessarily based on any assumption that the natural environment is something which in its existing state is wholly benign, or incapable of being improved by the hand of man. Impeccably natural earthquakes and eruptions can themselves cause damage, including damage to the environment, on a colossal scale. Nor is such concern based on any assumption that all damage caused by war to the environment is irreparable. Both natural and human agencies may greatly mitigate at least some of the effects of environmental damage.

The events of the war raise the question of what exactly we mean by the 'natural environment'—to use the phrase which occurs in Additional Protocol I 1977.³ The idea that 'nature' and 'man' are in two separate categories has remained highly influential in this century, for example in shaping policies regarding national

parks in the United States and various other countries. However, many aspects of the environment in which we live, especially where land and fresh water are concerned, are an amalgam of the natural and the artificial: and damage to those aspects of our environment may be just as serious as damage to those parts which are nearer to being purely 'natural', such as the seas and the atmosphere. In the 1991 Gulf War, much damage was inflicted by Iraq on the more purely 'natural' environments of sea and air, while the environmental damage by the Coalition was to the man-shaped environment within Iraq: it would be wrong to exclude the latter from this enquiry.

The environmental consequences of the 1991 Gulf War do not have priority over other issues arising from the manner in which the war was conducted. Questions concerned with other matters, such as the treatment of the inhabitants of Kuwait, and of prisoners and hostages, demonstrably involved large numbers of human lives and vast human suffering. We should not be surprised that, in the midst of death and destruction, and daily fear of worse to come in the form of gas, bacteriological and nuclear warfare, the belligerents did not always have as their first consideration the protection of the natural environment over the medium or long term.⁴

Yet the environmental damage in the 1991 Gulf War did raise classic issues of a kind with which the laws of war have traditionally been concerned. The laws of war—sometimes known as international humanitarian law—have always sought to limit certain kinds of military activities which cause death, misery, and destruction to those not directly involved in a war, or which continue to wreak havoc long after the actual war is over. It is partly for this reason that they have been concerned with the protection of civilians, and of neutral countries, shipping and property; with the rules against certain uses of weapons (*e.g.* some types of mines) which are liable to detonate blindly and at the wrong time; and with the prohibitions of unnecessary destruction. Against this background, it is entirely natural that discussion of the laws of war today should encompass renewed consideration of the environmental aspects of modern war.

The failure to prevent damage to the environment in the 1991 Gulf War was in marked contrast to a degree of success in preventing the conflict from getting out of hand in some other respects: many hostages, seized in the early weeks of the Iraqi occupation of Kuwait, were released before war broke out; Iraq was kept isolated; the war was kept within geographical limits and was brought to a swift conclusion; and gas, bacteriological, and nuclear weapons were not used. Why was there so conspicuous a failure over matters relating to the environment?

II. WAR AND ENVIRONMENT IN EARLIER WARS AND WRITINGS

Throughout history, wars have posed severe threats to at least the immediate environment. Scorched earth policies and deliberate flooding, whether offensive

or defensive, have had serious effects on cultivable land. Concern about damage to water supplies, orchards, crops and forests can be found in much writing and legal thinking about warfare over the centuries.⁵ Early writings on the laws of war, including those of Hugo Grotius, show great concern over devastation of land, fields, trees and so on.⁶

If the problem is perennial, the extent and depth of concern about it—the sense that natural resources are limited, the human environment fragile, and the problem global in character—is something which has clearly grown in the post-1945 period. Geoffrey Best has reflected the common perception that there is a new factor here:

The capacity of war to cause 'widespread, long-term and severe damage' to the natural environment constitutes a menace that is historically novel. Methods and means of warfare did not really place the doing of such damage to the natural environment within the reach of belligerents until World War II. What was however within their reach from earliest recorded times was the ability to destroy part of the anthropogenic environment. This history of civilization, past and present, scanned with a view to ascertaining what kinds and degrees of concern may have been shown about belligerents' religious, ethical or legal responsibilities in this respect discloses: (a) a small but consistent canon of laws and customs aiming to control the impact of hostilities on the anthropogenic environment; and (b) some lessons as to the value of those laws and customs and the value of the whole body of norms relating to warfare of which they form a part.⁷

In both world wars in this century, oil was a key bone of contention between the belligerents, and there were many cases of destruction of oil installations. However, such destruction was not generally seen at the time as an assault on the environment, nor as necessarily reprehensible. Thus, in the winter of 1916-17, when Romania was invaded by the forces of the Central Powers, the oilfields were destroyed on behalf of the Entente Powers:

Three-quarters of the country had been lost, with all the fertile corn-bearing plains and the oil-fields, by far the most extensive in Europe. Happily, the latter were to yield nothing to the enemy for several months, for Colonel Norton Griffiths, an English member of Parliament, went round in a car systematically destroying them. Sometimes he barely escaped from enemy patrols, and had often to face the not unnatural hostility of the population; where time was lacking for him to set them on fire, they were put out of action by throwing obstructions down the pipes.⁸

The Second Indochina War (the Vietnam War), which ended in 1975, saw massive programs of defoliation, forest-destruction, and attempts at rain-making: these were widely criticized internationally, and contributed greatly to international efforts to tackle environmental aspects of warfare.⁹ The U.S. Government appears to have recognized that the use of such weapons in

international war, outside the territory of a government which acquiesced in it, would be legally questionable. George Aldrich, from 1965 to 1977 a Legal Adviser for East Asian and Pacific Affairs in the State Department, subsequently wrote:

Even during the Vietnam War, when American armed forces used defoliants on a large scale, the legal advice given by the Legal Adviser to the Secretary of State was that it would be prudent to limit their use to the territories of South Vietnam and Laos, where we had the consent of the Government of the territory, and avoid establishing a precedent for the first use of these novel chemical agents as weapons of war on the territory of either an adversary (North Vietnam) or a neutral (Cambodia). To the best of my knowledge, that advice was followed. . . .¹⁰

The Iran-Iraq War of 1980-88 saw extensive environmental damage, some of it resulting from the large-scale destruction of oil installations. There were numerous oil spills in the waters of the Gulf, the worst of which was in the Nowruz field off the coast of Iran in 1983, but none was quite on the scale of the major spill in the 1991 Gulf War. U.N. Security Council Resolution 540 of 31 October 1983, condemning violations of international humanitarian law in this war, called on belligerents to stop hostilities in the Gulf, and to refrain from action threatening marine life there.

III. GENERAL INTERNATIONAL LAW AND THE ENVIRONMENT

International norms relating to the protection of the environment can be found in many quite different kinds of framework. There should be no automatic assumption that the laws of war are the only relevant body of law, or the only means of tackling a rather complex set of problems. Indeed, general political statements from the Stockholm Declaration 1972¹¹ to the Rio Declaration 1992,¹² and also U.N. General Assembly resolutions, may be as important as formally binding agreements. There is also a growing number of general multilateral and other treaties relating directly or indirectly to the environment. Examples include not only the main treaties in the field of environmental law, but also the 1959 Antarctic Treaty¹³, partly motivated by the desire to preserve the fragile ecology of the Antarctic; the Partial Nuclear Test Ban Treaty of 1963,¹⁴ partly motivated by widespread concern about the effects of nuclear testing on the atmosphere and thereby on the food chain; and the 1972 Biological Weapons Convention,¹⁵ which completely prohibits the possession of certain weapons of a type which could seriously impact the environment.

Treaties with a bearing on the environment, though normally applicable in peacetime, may continue to be applied in wartime as well. Whether or not such treaties are formally applicable, belligerents may be expected to operate with due regard for their provisions. Further, such treaties may still govern relations between belligerents and neutrals.

The terms of many treaties were potentially relevant to practical issues faced in the 1990-91 Gulf Conflict. A few examples must suffice. The 1954 Convention for the Prevention of Pollution of the Sea by Oil deals with oil discharged from ships. However, it gives a higher priority to other values, including human life, when it specifies that the treaty does not apply to "the discharge of oil ... for the purpose of securing the safety of the ship, preventing damage to the ship or cargo, or saving life at sea."¹⁶ The 1982 Law of the Sea Convention,¹⁷ in force only since November 1994, contains extensive obligations to protect the marine environment.

Various bilateral and regional treaties were of particular significance in this war. The most important regional accord on environmental matters was the Kuwait Regional Convention for Cooperation on the Protection of the Marine Environment from Pollution 1978, to which many States in the region were parties, including Iran, Iraq, Kuwait, and Saudi Arabia. In accord with its terms, the Regional Organization for the Protection of the Marine Environment (ROPME) was established, with headquarters in Kuwait. Remarkably, its Council had continued to hold meetings, with participation from both warring parties, during the Iran-Iraq War. During the Iraqi occupation of Kuwait in 1990-91, its staff fled, but its headquarters was not looted or taken over. ROPME did assist clean-up operations in 1991 and after.¹⁸

IV. THE LAWS OF WAR AND THE ENVIRONMENT

Despite the importance of other legal approaches, the laws of war, which attracted considerable attention in the 1991 Gulf War, are central to any discussion of efforts to control the environmental damage of war. If the environment is not to be ignored completely in the conduct of hostilities, then there is an obvious case for having specific rules relating to the protection of the environment, not just in general, but also in wartime.

What, if anything, do the laws of war say about the environment? Sometimes it is asserted that the laws of war have failed entirely to address this problem: this is used as one argument for now creating a new international treaty on the subject. Thus, remarkably, the Soviet Minister of the Environment, Prof. Nikolai Vorontsov, wrote in May 1991:

There was no sound scientific examination of the destruction caused to the environment during the war in Vietnam, no lessons were learned. After the war, no measures on environmental protection in case of armed conflicts were worked out.¹⁹

In fact, the provisions of the laws of war regarding the environment, while far from satisfactory, are by no means as lacking as Prof. Vorontsov suggested. This is one of the many areas in which the laws of war consist of a very disparate body of principles, treaties, customary rules, and practices, which have developed over

the centuries in response to a wide variety of practical problems and moral concerns.

A. Underlying Principles of the Laws of War

In considering what the laws of war have to say about environmental damage, it is necessary to start with their underlying principles, most of which seem to have a bearing on the question of environmental destruction. These principles, though ancient in origin, are reflected in many modern texts and military manuals. They include the principle of *proportionality*, particularly in its meaning of proportionality in relation to the adversary's military actions or to the anticipated military value of one's own actions; the principle of *discrimination*, which is about care in the selection of methods, of weaponry and of targets; the principle of *necessity*, under which belligerents may only use that degree and kind of force, not otherwise prohibited by the law of armed conflict, which is required for the partial or complete submission of the enemy with a minimum expenditure of time, life, and physical resources; and the closely-related principle of *humanity*, which prohibits the employment of any kind or degree of force not required for the purpose of the partial or complete submission of the enemy with a minimum expenditure of time, life, and physical resources.²⁰

Each of these four principles strongly points to the conclusion that actions resulting in massive environmental destruction, especially where they do not serve a clear and important military purpose, would be questionable on many grounds, even in the absence of specific rules of war addressing environmental matters in detail. When the four principles are taken together, such a conclusion would seem inescapable.

It has been suggested by Richard Falk that there are, in addition, two 'subsidiary principles' which "seem to be well-grounded in authoritative custom and to have relevance to the array of special problems posed by deliberate and incidental environmental harm." These are the principles of *neutrality* and of *inter-generational equity*.²¹ The proposition that these are in fact key principles of the laws of war, though it may be unorthodox, is serious. Both these types of consideration do inform certain provisions of the laws of war, and do affect attitudes to environmental destruction. However, since these principles do not add greatly to existing law as reflected in the four principles already outlined and in treaties, it is not necessary to pursue the issue here.

There are obvious limits to the value of customary principles as a basis for guiding the policies of States in wartime. As Richard Falk has said, in pessimistic vein:

there are extreme limitations associated with a need to rely on these customary principles. Their formulation is general and abstract, and susceptible to extreme subjectivity and selectivity in their application to concrete circumstances.²²

B. Treaties on the Laws of War

Can treaty law, with its more precise texts and its formal systems of adherence by States, overcome any limitations of the framework of principles as outlined above? In treaties on the laws of war, several kinds of prohibitions can be found which have a bearing on the protection of the environment in armed conflicts and in occupied territories:

1. Many general rules protecting civilians, since these rules also imply protection of the environment on which the civilians depend.²³
2. Prohibitions of unnecessary destruction, and of looting of civilian property.
3. Prohibitions of attacks on certain objectives and areas (*e.g.*, restrictions on the destruction of dikes).
4. Prohibitions and restrictions on the use of certain weapons (*e.g.*, gas, chemical and bacteriological).
5. Prohibitions and restrictions on certain methods of war (*e.g.*, the poisoning of wells, or the indiscriminate and unrecorded laying of mines).

The word 'environment' does not occur in any treaty on the laws of war before 1977. This does not mean that there was no protection of the environment, but rather that such protection is found in a variety of different forms and contexts. The pre-1977 treaties on the laws of war relate to protection of the environment obliquely rather than directly: they offer general statements of principle, and also some detailed regulations which may on occasion happen to be relevant to the environment.

Thus, the 1868 St. Petersburg Declaration on explosive projectiles, in ringing words which were to prove terribly problematic in subsequent practice, declared that "the only legitimate object which States should endeavour to accomplish during war is to weaken the military forces of the enemy."²⁴

Several of the Hague Conventions and Declarations of 1899 and 1907 contained provisions with a bearing on the environment. In the 1907 Hague Convention IV on land war,²⁵ the preamble refers to the need "to diminish the evils of war, as far as military requirements permit", and goes on to state in the famous Martens Clause:

Until a more complete code of the laws of war has been issued, the high contracting Parties deem it expedient to declare that, in cases not included in the Regulations adopted by them, the inhabitants and the belligerents remain under the protection and the rule of the principles of the law of nations, as they result from the usages established among civilized peoples, from the laws of humanity, and the dictates of the public conscience.²⁶

In the Regulations annexed to the 1907 Hague Convention IV, Article 22 states: "The right of belligerents to adopt means of injuring the enemy is not unlimited." Geoffrey Best has commented: "Post-1945 extensions of that principle from its

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traditional application to enemy persons and properties to the natural environment are no more than logical, given the novel and awful circumstances that have suggested them.”²⁷ Article 23 (g) of the Hague Regulations is relevant to certain instances of environmental damage when it states that it is especially forbidden “to destroy or seize the enemy’s property, unless such destruction or seizure be imperatively demanded by the necessities of war.” Also in the Regulations, Section III (which deals with military occupations) contains many provisions having a potential bearing on environmental protection. Article 55 is the most obvious, but not the only, example:

The occupying State shall be regarded only as administrator and usufructuary of public buildings, real estate, forests, and agricultural estates belonging to the hostile State, and situated in the occupied country. It must safeguard the capital of these properties, and administer them in accordance with the rules of usufruct.

It could be further argued that the rules relating to neutrality in war, as contained in 1907 Hague Convention V (in land war) and 1907 Hague Convention XIII (in naval war), by requiring belligerents to respect the sovereign rights of neutral powers, prohibit environmental damage seriously affecting a neutral State.²⁸ This is a typical case in which protection of the environment, even where it is not mentioned in existing law, may nonetheless be a logical implication of such law.

The 1925 Geneva Protocol on gas and bacteriological warfare²⁹ provides one basis for asserting the illegality of forms of chemical warfare having a harmful effect on the environment. The Protocol has been the subject of a number of controversies as to its exact scope, and these controversies have included matters relating to the environment. In 1969, during the Second Indochina War, and following reports of U.S. use of chemicals in Vietnam, a U.N. General Assembly Resolution (which unsurprisingly did not receive unanimous support) addressed the issue, declaring that the 1925 Protocol prohibits the use in armed conflicts of:

- (a) Any chemical agents of warfare — chemical substances, whether gaseous, liquid or solid — which might be employed because of their direct toxic effects on man, animals or plants;
- (b) Any biological agents of warfare — living organisms, whatever their nature, or infective material derived from them — which are intended to cause disease and death in man, animals or plants, and which depend for their effects on their ability to multiply in the person, animal or plant attacked.³⁰

The four 1949 Geneva Conventions say little about the protection of the environment. They are concerned above all with the immediate and important task of protection of victims of war. However, one of these agreements, the 1949 Geneva Convention IV (the Civilians Convention) builds on the similar provisions

of the 1907 Hague Regulations when it states in Article 53, which is in the section on occupied territories:

Any destruction by the Occupying Power of real or personal property belonging individually or collectively to private persons, or to the State, or to other public authorities, or to social or co-operative organizations, is prohibited, except where such destruction is rendered absolutely necessary by military operations.³¹

The International Committee of the Red Cross (ICRC) commentary on this article contains the following assessment on the question of 'scorched earth' policies:

A word should be said here about operations in which military considerations require recourse to a 'scorched earth' policy, *i.e.* the systematic destruction of whole areas by occupying forces withdrawing before the enemy. Various rulings of the courts after the Second World War held that such tactics were in practice admissible in certain cases, when carried out in exceptional circumstances purely for legitimate military reasons. On the other hand, the same rulings severely condemned recourse to measures of general devastation whenever they were wanton, excessive or not warranted by military operations.³²

Article 147 of Geneva Convention IV, and similar articles in Conventions I and II,³³ confirm that grave breaches of the Convention include "extensive destruction and appropriation of property, not justified by military necessity and carried out unlawfully and wantonly."

The 1954 Hague Cultural Property Convention³⁴ seeks to protect a broad range of objects, including groups of historic buildings, archaeological sites, and centers containing a large amount of cultural property. All such property is to be protected from exposure to destruction, damage, and pillage. In many cases, obviously, action which was wantonly destructive of the environment would also risk violating the provisions of this Convention.

Environmental matters were addressed by name and directly in two laws of war agreements concluded in 1977. In both cases one important stimulus to new law-making was the Second Indochina War. Although neither of these treaties was formally in force in the 1991 Gulf War, they provide language and principles which may assist in defining and asserting the criminality of certain threats to the environment.

The first of these two 1977 agreements is the U.N. Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques.³⁵ This accord (otherwise known as the ENMOD Convention) was concluded mainly in reaction to the use by the United States of forest and crop destruction, and rain-making techniques, in the Second Indochina War. It deals, essentially, not with damage to the environment, but with the use of the forces of

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the environment as weapons.³⁶ Article I prohibits all “hostile use of environmental modification techniques having widespread, long-lasting or severe effects as the means of destruction, damage or injury” to the adversary. Article II then defines ‘environmental modification techniques as “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.” An authoritative U.N. understanding which was attached to the draft text of the Convention in 1976 provides a non-exhaustive list of phenomena which could be caused by environmental modification techniques: these include, among other things, “an upset in the ecological balance of a region.”

The second of these 1977 laws of war agreements touching on the environment is the 1977 Additional Protocol I.³⁷ This accord, which is additional to the four 1949 Geneva Conventions, contains extensive provisions protecting the civilian population and civilian objects. Article 48, entitled ‘Basic Rule’, states:

the Parties to the conflict shall at all times distinguish between the civilian population and combatants and between civilian objects and military objectives and accordingly shall direct their operations only against military objectives.

Article 52, on ‘General Protection of Civilian Objects’, similarly provides a framework for protecting civilian objects, and thus has obvious implications for protection of the environment.

In two of its articles, Additional Protocol I deals specifically with the question of damage *to* the natural environment. (This is distinct from the manipulation of the forces of the environment as weapons, which had been addressed in the ENMOD Convention.) Article 35, which is in a section on ‘Methods and Means of Warfare’, states in full (the third paragraph being the most explicit on the environment):

1. In any armed conflict, the right of the Parties to the conflict to choose methods and means of warfare is not unlimited.
2. It is prohibited to employ weapons, projectiles and material and methods of warfare of a nature to cause superfluous injury or unnecessary suffering.
3. 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.

The second article in Additional Protocol I referring specifically to damage to the environment is in the chapter on ‘Civilian Objects’, which is within the section

of the Protocol dealing with protection of the civilian population against the effects of hostilities. Article 55 states in full:

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

The ICRC commentary notes that the ‘care shall be taken’ formula in the first paragraph of Article 55 leaves some latitude for judgment, whereas the second paragraph contains an absolute prohibition.³⁸ In all cases, it is clear that the phrase ‘widespread, long-term and severe damage’ excludes a great deal of minor and short-term environmental damage. Bothe, Partsch and Solf say:

Arts. 35(3) and 55 will not impose any significant limitation on combatants waging conventional warfare. It seems primarily directed to high level policy decision makers and would affect such unconventional means of warfare as the massive use of herbicides or chemical agents which could produce widespread, long-term and severe damage to the natural environment.³⁹

The rules regarding the environment in Articles 35 and 55 have produced some rather varied responses. The UK delegation in the negotiations was cool about the inclusion of the clause relating to the environment in Article 35: “We consider that it is basically in order to protect the civilians living in the environment that the environment itself is to be protected against attack. Hence, the provision on protection of the environment is in our view rightly placed in the section on protection of civilians.”⁴⁰

In its examination of both Articles 35 and 55, the ICRC commentary considers the meaning of ‘long-term’, suggesting that it refers to decades rather than months. This may exclude much environmental damage. However, the commentary does make it clear that the term ‘natural environment’ should be interpreted broadly, referring as it does to the “system of inextricable interrelations between living organisms and their inanimate environment.” Indeed, the last words of Article 55, paragraph 1, imply such a connection between the environment and humankind.⁴¹ The commentary says:

The concept of the natural environment should be understood in the widest sense to cover the biological environment in which a population is living. It does not consist merely of the objects indispensable to survival mentioned in Article 54 ... but also includes forests and other vegetation mentioned in the Convention of 10 October

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1980 on Prohibitions or Restrictions on the Use of Certain Conventional Weapons as well as fauna, flora and other biological or climatic elements.⁴²

Article 54, mentioned in the preceding quotation, is one of a number of other provisions in the same chapter of Additional Protocol I which, while not mentioning the environment by name, do in fact prohibit certain forms of military action destructive of the environment. Thus Article 54, paragraph 2, states (subject to certain important provisos in paragraphs 3 and 5):

It is prohibited to attack, destroy, remove or render useless objects indispensable to the survival of the civilian population, such as foodstuffs, agricultural areas for the production of foodstuffs, crops, livestock, drinking water installations and supplies and irrigation works, for the specific purpose of denying them for their sustenance value to the civilian population or to the adverse Party, whatever the motive, whether in order to starve out civilians, to cause them to move away, or for any other motive.

Still in the chapter on 'Civilian Objects', Article 56 deals with 'Protection of works and installations containing dangerous forces'. Paragraph 1 (subject to certain provisos in paragraph 2) states:

Works or installations containing dangerous forces, namely dams, dykes and nuclear electrical generating stations, shall not be made the object of attack, even where these objects are military objectives, if such attack may cause the release of dangerous forces and consequent severe losses among the civilian population. Other military objectives located at or in the vicinity of these works or installations shall not be made the object of attack if such attack may cause the release of dangerous forces from the works or installations and consequent severe losses among the civilian population.

This article is qualified by the second paragraph, which in effect says that the protection it offers ceases if the military objective in question is used in regular, significant, and direct support of military operations. Despite this qualification, during the 1980s the U.S. government argued that the article gave too great a degree of immunity to dams, dikes, and nuclear electrical generating stations.⁴³ A further U.S. criticism was that "the provisions of Article 56 purposely use the word 'attack' rather than 'destroy' (as was contained in the original ICRC proposal) in order to preserve the right of a defender to release dangerous forces to repel an attacker. . . ."⁴⁴ However, the article plainly does not give total immunity from attack. Where hydroelectric generating stations or nuclear power plants are contributing to a grid in regular, significant, and direct support of military operations, militarily necessary attacks against them are not prohibited.⁴⁵

Others have suggested that Article 56 did not go far enough, or that it should be interpreted to cover a wider range of works and installations containing dangerous forces than the words "namely dams, dykes and nuclear electrical

generating stations” might suggest.⁴⁶ This latter view does not reflect the negotiating history of Article 56. This particular article does not cover the question of attacking other kinds of installations containing dangerous forces: for example, factories manufacturing toxic products, and oil facilities. The ICRC commentary indicates that such installations were excluded from Article 56, but may be covered by other articles:

Several delegations wished to include other installations in the list, in particular oil production installations and storage facilities for oil products. It appears that the consultations were not successful, and the sponsors of proposals in this field finally withdrew them. There is no doubt that Article 55 ... will apply to the destruction of oil rigs resulting in oil gushing into the sea and leading to extensive damage such as that described in that article. As regards the destruction and setting alight of refineries and petroleum storage facilities, it is hardly necessary to stress the grave danger that may ensue for the civilian population. Extending the special protection to such installations would undoubtedly have posed virtually insoluble problems, and it is understandable that the Conference, when it adopted these important prohibitions, limited them to specific objects.⁴⁷

Much else in Additional Protocol I has a bearing on the environment. Thus, in the chapter on Civil Defence, which seeks to give protection to various measures intended to alleviate the effects of hostilities or disasters, the tasks of civil defense forces are so defined in Article 61 as to include, *inter alia*: decontamination and similar protective measures; emergency repair of indispensable public utilities; and assistance in the preservation of objects essential for survival.⁴⁸

Given that Additional Protocol I was not binding as a treaty during the 1991 war, can its key rules on the environment be said to reflect customary law? A number of general rules which have implications for the environment, including Article 48 and much of Article 52, are widely accepted as customary law. As to Articles 35(3) and 55, which specifically mention the environment, Prof. Greenwood acknowledges that they have been viewed by Germany and the United States as representing a new rule; he then states:

Nevertheless, while there is likely to be continuing controversy about the extent of the principle contained in Article 35(3), the core of that principle may well reflect an emerging norm of international law.

As to Article 56, he suggests that there are grounds for doubting whether the special additional protection it affords to dams, dikes, and nuclear power stations has the status of customary law.⁴⁹

Only one other laws of war agreement refers specifically to the environment: the 1981 U.N. Convention on Specific Conventional Weapons.⁵⁰ The preamble repeats the exact words of Additional Protocol I, Article 35(3), which were quoted

in full above, and also recalls a number of other general principles which could have a bearing on environmental damage. Protocol III annexed to the Convention deals with incendiary weapons. Article 2, paragraph 4 of that Protocol states, in a notably weak formulation:

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.

C. Case Law

In addition to treaties, past cases are an important guide to the law. In the Second World War there was much general devastation, on many fronts in both Europe and Asia. Some of this resulted in charges of wanton destruction at post-war trials.

The Charter of the International Military Tribunal at Nuremberg did not specifically mention the environment, but it did include in its catalogue of war crimes “plunder of public or private property, wanton destruction of cities, towns, or villages, or devastation not justified by military necessity.” In the Tribunal’s trial of the major German war criminals in 1945-46, there was a great deal of evidence about such destruction. One of the defendants, General Alfred Jodl, was *inter alia* found guilty of war crimes including scorched earth destruction in respect of North Norway, Leningrad, and Moscow.⁵¹

Many post-Second World War cases before national tribunals related to environmentally damaging abuse of natural resources in occupied territories. In respect of one Polish case, the United Nations War Crimes Commission was asked to determine whether ten German civilian administrators, each of whom had been the head of a department in the Forestry Administration in occupied Poland in 1939-44, could be listed as war criminals on a charge of pillaging Polish public property. It was alleged that the accused had caused “the wholesale cutting of Polish timber to an extent far in excess of what was necessary to preserve the timber resources of the country.” The U.N. War Crimes Committee agreed that *prima facie* evidence of the existence of a war crime had been shown, and nine of the ten officials charged were listed as accused war criminals.⁵²

On the other hand, in one post-war case, scorched-earth policies by a retreating occupying power were not ruled to be necessarily illegal. In the case of *United States v. Wilhelm List* (also called the *Hostages Case*), a U.S. military tribunal at Nuremberg found one of the defendants, General Lothar Rendulic, not guilty on a part of the charge against him based on scorched earth. In the winter of 1944-45, he had been in charge of retreating German forces in northern Norway. As a precautionary measure against a possible attack by advancing Soviet forces, he had destroyed housing, communication and transport facilities in the area. The court

said that the defendant “may have erred in the exercise of his judgement but he was guilty of no criminal act.” This part of the judgment was intensely controversial in Norway, and was discussed in the Storting on several occasions. It was widely felt that these German devastations, which had continued up to 6 May 1945, went far beyond the demands of military realism.⁵³

V. PROBLEMS OF THE LEGAL PROVISIONS AS THEY STOOD IN 1990

A. General Problems

Before the events of the Gulf Conflict of 1990-91, international law in general, and the laws of war in particular, had not been silent on the matter of environmental damage in war. Yet there are many bases of criticism of the rules as they stood in 1990. The provisions were dispersed in too many types of sources and in too many different agreements; they lacked specificity; they relied heavily on the always hazardous process whereby commanders balance military necessity against other considerations; they had not caught up with the growing concern in many countries about environmental issues; and the means of investigating complaints and punishing violations were not always clear. Above all, there was no effective means of ensuring that an admittedly disparate set of principles and rules was actually accepted, understood, and implemented; and there was much scope for disagreement about what were acceptable targets and methods where risks to the environment were involved.⁵⁴

Treaties on the laws of war, before 1977, contained no mention of the word ‘environment’; and their provisions can be said to relate to the environment only indirectly. They do so through prohibitions of wanton destruction; and also through protection of property, whether public or private — an approach which has limits as some environmental ‘goods’, such as the air we breathe, are not property. Despite such weaknesses, these older rules constituted the strongest legal basis for asserting the illegality of much environmental destruction in war.

Finally, some of the newer laws-of-war rules which attempt to deal directly with protection of the environment—especially those in the 1977 Additional Protocol I and in the ENMOD Convention—had serious limitations, some of which have been mentioned above. They had also failed to secure universal assent: this is indicated by the U.S. attitude to the Protocol, discussed next. During the 1990-91 crisis there was a tendency in public statements about environmental damage to refer mainly to these newer rules, because they do mention the word ‘environment’ as such, whereas legally stronger and more directly relevant provisions from earlier treaties received less attention.

B. U.S. Attitudes to the Environmental Provisions of Additional Protocol I

Of all the laws of war sources which have been cited, the Additional Protocol I might seem to have the clearest and most explicit provisions about damage to the

environment. Yet these provisions are not without problems, both as regards their substance and as regards the non-participation of certain important States, especially the United States, in this agreement. U.S. official and non-official thinking on Additional Protocol I is more open than that in other States, and merits scrutiny.

Despite its non-accession to Additional Protocol I, the U.S. Government had explicitly recognized, long before Iraq's invasion of Kuwait, that many of this agreement's provisions either reflect customary law, or merit support on other grounds. The key question, therefore, is whether the U.S. Government takes such a view of the provisions which have a bearing on protection of the environment.

When, on 29 January 1987, President Reagan transmitted Additional Protocol II to the U.S. Senate for its advice and consent to ratification, he said in his letter of transmittal:

... we can reject Protocol I as a reference for humanitarian law, and at the same time devise an alternative reference for the positive provisions of Protocol I that could be of real humanitarian benefit if generally observed by parties to international armed conflicts. We are therefore in the process of consulting with our allies to develop appropriate methods for incorporating these positive provisions into the rules that govern our military operations, and as customary international law. I will advise the Senate of the results of this initiative as soon as it is possible to do so.⁵⁵

Earlier in January 1987, Michael J. Matheson, Deputy Legal Adviser, United States Department of State, had given a fuller account of U.S. Government thinking about Additional Protocol I. He acknowledged that U.S. non-ratification left a gap, and gave some indication as to how it might be filled:

Protocol I cannot be now looked to by actual or potential adversaries of the United States or its allies as a definitive indication of the rules that U.S. forces will observe in the event of armed conflict and will expect its adversaries to observe. To fill this gap, the United States and its friends would have to give some alternative clear indication of which rules they consider binding or otherwise propose to observe.

...

... in our discussions with our allies to date we have not attempted to reach an agreement on which rules are presently customary law, but instead have focused on which principles are in our common interests and therefore should be observed and in due course recognized as customary law, whether they are presently part of that law or not.⁵⁶

Mr Matheson went on to list "the principles that we believe should be observed and in due course recognized as customary law, even if they have not already achieved that status..." His partial listing of these principles did not include those which explicitly address the protection of the natural environment. Indeed, he indicated that the U.S. administration was opposed to the principle in Article 35

regarding the natural environment, saying that it was “too broad and ambiguous and is not a part of customary law.”⁵⁷ He was also reported as expressing U.S. opposition to the rule on protection of the environment in Article 55 on the ground that it was:

too broad and too ambiguous for effective use in military operations. He concluded that the means and methods of warfare that have such a severe effect on the natural environment so as to endanger the civilian population may be inconsistent with other general principles, such as the rule of proportionality.⁵⁸

Matheson and Judge Abraham Sofaer, Legal Adviser, United State Department of State, also criticized in detail the provisions of Article 56, concerning works and installations containing dangerous forces; as have some subsequent official U.S. writings.⁵⁹

In the public polemics about whether or not the U.S. should ratify Additional Protocol I, there had not been a systematic and sustained debate about these particular provisions bearing on the environment. George Aldrich did go so far as to assert that these provisions may be verging on the status of customary law:

While these provisions of Articles 35 and 55 are clearly new law — ‘rules established by the Protocol’ — I would not be surprised to see them quickly accepted as part of customary international law insofar as non-nuclear warfare is concerned...⁶⁰

Despite such optimism, the awkward truth is that the U.S. went into the 1991 Gulf War against a background of scepticism, not just generally about Additional Protocol I, but particularly about those of its provisions that explicitly mention the environment. Further, the initiatives to consult allies to determine which of the Protocol’s provisions were generally acceptable had not led to any published results by the start of 1991.⁶¹ These facts may have hampered the U.S. from placing much explicit reliance on provisions in Additional Protocol I, even though there were many which were accepted in practice and did have at least an indirect bearing on environmental protection.

VI. APPLICABILITY OF LAWS OF WAR IN THE 1990-91 GULF CONFLICT

From 2 August 1990 — the day when armed conflict between Iraq and Kuwait began — many laws of war agreements were, beyond any serious doubt, formally in force as regards the Iraqi occupation and the subsequent war. (The term ‘conflict’ is used here to refer to both the occupation and the war.) Some other agreements were not formally in force.

The following sections show which of the principal States involved in, or directly affected by, the conflict were formal parties to the relevant accords. The

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positions of fourteen States, chosen somewhat arbitrarily, are considered here: Canada, Egypt, France, Iran, Iraq, Israel, Italy, Jordan, Kuwait, Saudi Arabia, Syria, Turkey, U.K., and U.S.

This is obviously not intended as a complete list: forty-two countries provided contributions to the Coalition, of which twenty-eight took part in military activities in the region: yet only ten of them appear in this list. In addition, many other States in the region were involved in the war and its consequences in some other way.

A. Agreements in Force in the Gulf Conflict

The laws of war agreements under the following three headings were beyond any serious doubt formally in force.

1. 1907 Hague Convention IV and Regulations on Land Warfare. Although by no means all the States involved in the conflict were formally parties to this accord, or to the very similar one of 1899, the Hague Convention No. IV and Regulations are widely accepted as part of international customary law, binding on all States. They govern the conduct of occupation forces as well as armed combat. (Other 1907 Hague Conventions also contained many relevant provisions, especially No. V on Neutrality in Land War, No. VIII on Automatic Submarine Contact Mines, No. IX on Bombardment by Naval Forces, and No. XIII on Neutrality in Naval War.)⁶²

2. 1925 Geneva Protocol on Gas and Bacteriological Warfare.⁶³ All fourteen States listed above were parties to this treaty, which prohibits the use in war of gas, chemical and bacteriological weapons.

3. The four 1949 Geneva Conventions on Protection of Victims of War.⁶⁴ All fourteen States (and indeed virtually all States in the international community) were parties to these treaties, which govern, respectively: I - Wounded and Sick; II - Wounded, Sick and Shipwrecked at Sea; III - Prisoners of War; IV - Civilians, especially in occupied territory, and under internment.

In addition, because Iraq and Kuwait were both parties, the 1954 Hague Cultural Property Convention and Protocol⁶⁵ was in force, at least as regards Iraq's occupation of Kuwait. Although three of the fourteen States listed above were not parties — Canada (which had not signed at all), and U.K. and U.S. (which had signed but not ratified) — they have observed the Convention's main provisions in practice. As the convention's relevance to environmental protection is limited, its application in the 1991 Gulf War is not pursued here.

B. Agreements Not Fully in Force in the Gulf Conflict

Certain key agreements were not fully in force for all parties to this conflict. The three most recent laws of war agreements — and the only ones to mention the environment by name — all fell into this category.

The 1977 Convention on Environmental Modification Techniques⁶⁶ entered into force in a general way on 5 October 1978. Of the fourteen countries listed above, only six (Canada, Egypt, Italy, Kuwait, U.K., and U.S.) were parties. Four (Iran, Iraq, Syria and Turkey) had signed but not ratified. Four (France, Israel, Jordan, and Saudi Arabia) had not signed or acceded at all. It is possible that States parties were still obliged to implement this agreement in the war.

The 1977 Additional Protocol I⁶⁷ entered into force in a general way on 7 December 1978. Of the fourteen countries listed above, only six (Canada, Italy, Jordan, Kuwait, Saudi Arabia, and Syria) were parties. Again, four (Egypt, Iran, U.K., and U.S.) had signed but not ratified. Four (France, Iraq, Israel, and Turkey) had not signed or acceded at all.⁶⁸ According to its Article 1, paragraph 3, this treaty applies in the situations referred to in Article 2 common to the four 1949 Geneva Conventions: in other words, it applies as between States parties, who are also obliged to apply it in relations with a non-party if the latter accepts and applies the treaty's provisions. Since Iraq showed no sign of doing this, and since a significant number of its adversaries were not parties, the Protocol cannot be said to have been in force in the Gulf conflict. However, as noted below, certain States not parties to the Protocol (including the U.S.) did make moves towards 'accepting and applying' some of the Protocol's provisions in this conflict.

The 1981 U.N. Convention on Specific Conventional Weapons⁶⁹ was also not formally in force in the Gulf conflict. Indeed, the only one of the fourteen States listed above to have become legally bound by it (through signature and ratification) was France; and France, at ratification of this Convention, had only accepted its Protocols I and II — not Protocol III on incendiary weapons.

Despite the fact that they were not formally in force in this war, these three agreements were potentially relevant to the Gulf conflict in a number of overlapping ways. Firstly, to the extent that some of their provisions were accepted as an expression of customary international law, they were binding on all States. Secondly, many States could in practice, as a matter of policy as much as of formal legal obligation, choose to observe norms outlined in these agreements; and the language used in these accords provided one basis for pronouncements, including by U.S. authorities, about policy controlling the use of force in this conflict.

C. ICRC Statements on Applicability of Law

From 2 August 1990 onwards, in extensive direct contacts with the governments concerned, and also in press releases, the International Committee of the Red Cross repeatedly reminded the States involved in the Kuwait crisis of their legal obligations under the laws of war.⁷⁰ The most detailed of these reminders was in a Memorandum on the Applicability of International

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Humanitarian Law, sent to the 164 parties to the Geneva Conventions in mid-December 1990. This included the following statements:

The following general rules are recognized as binding on any party to an armed conflict:

— the parties to a conflict do not have an unlimited right to choose the methods and means of injuring the enemy;

— a distinction must be made in all circumstances between combatants and military objectives on the one hand, and civilians and civilian objects on the other. It is forbidden to attack civilian persons or objects or to launch indiscriminate attacks;

— all feasible precautions must be taken to avoid loss of civilian life or damage to civilian objects, and attacks that would cause incidental loss of life or damage which would be excessive in relation to the direct military advantage anticipated are prohibited.

....

The ICRC invites States which are not party to 1977 Protocol I to respect, in the event of armed conflict, the following articles of the Protocol, which stem from the basic principle of civilian immunity from attack:

— Article 54: protection of objects indispensable to the survival of the civilian population;

— Article 55: protection of the natural environment;

— Article 56: protection of works and installations containing dangerous forces.⁷¹

This, and other ICRC statements, could be criticized, especially for their emphasis on Additional Protocol I 1977, not technically in force in this conflict. Certain other principles and rules (for example the prohibition of wanton destruction in Geneva Convention IV, 1949) might have provided a legally sounder and politically more acceptable basis for protection of the environment.

In a press release issued on 1 February 1991, over ten days after the major Iraqi oil spills into the Gulf had begun, the ICRC issued another warning against environmental destruction:

The right to choose methods or means of warfare is not unlimited. Weapons having indiscriminate effects and those likely to cause disproportionate suffering and damage to the environment are prohibited.⁷²

D. The Problem of Iraqi Compliance

A central problem with the application of the law was that Iraq tried to escape its obligations. After 2 August 1990, when the ICRC was seeking to carry out

humanitarian activities in Kuwait, the Iraqi authorities denied that the conflict was an international one. Various ICRC efforts in autumn 1990 to get Iraq to accept its obligations under the Geneva Conventions were unsuccessful.⁷³ After the beginning of Operation Desert Storm in January 1991, the definition of the hostilities as international does not appear to have been contested by any party, but Iraq was still not forthcoming about its legal obligations. It only began to accept them (for example, in relation to prisoners of war) around the time of the liberation of Kuwait and cease-fire at the end of February 1991.

VII. PRE-WAR WARNINGS OF ENVIRONMENTAL DAMAGE

Before war actually broke out on the night of 16-17 January 1991, there was more than adequate warning of possible environmental damage in the event of a war over Kuwait. Iraq consistently threatened to set fire to the oilfields. On 23 September 1990, Saddam Hussein said in a statement that if there was a war, Iraq would strike at the oilfields of the Middle East and Israel.⁷⁴ On 23 December, in immediate response to tough comments in Cairo by the U.S. Secretary of Defense, Richard Cheney, the Iraqi Defense Minister said in Baghdad: "Cheney and his aides will see how the land will burn under their feet not only in Iraq but ... also in Eastern Saudi Arabia, where the Saudi fighters will also feel the land burn."⁷⁵

These Iraqi statements, like the threats to use hostages as human shields, appear to have further solidified international opinion against Iraq.⁷⁶ To the extent that this is so, it confirms the complexity and importance of the links between *jus in bello* and *jus ad bellum*.

The scope of the potential environmental threat of a war over Kuwait was heavily publicized in the weeks before the war, but mainly by those arguing that war should be avoided altogether. King Hussein of Jordan gave such a warning at the Second World Climate Conference in Geneva in November 1990. Similarly, at a symposium of scientists held in London on 2 January 1991 it was suggested that a large proportion of the oil wells had been mined and might be ignited by the Iraqis; that the resulting fires might burn up to 3 million barrels of crude oil a day; and that oil spilt from damaged wells and pipelines would flow into the Gulf, causing a spill "10 to 100 times the size of the Valdez disaster." (It was apparently assumed that the large spill envisaged would happen as a by-product of general damage to wells, rather than as a result of deliberate Iraqi policy.) Some, including Dr. Abdullah Toukan, chief scientific adviser to King Hussein of Jordan, argued that a war in the Gulf would lead to a "global environmental catastrophe," including a "mini nuclear winter." Dr. John Cox, calling for a computer simulation (and accepting that it might show that "my fears are groundless") said of the possible effect on the Middle East climate: "We must not wait until six months after the fires are burning, and we see 500 million people starving as a result of

climate changes, then have scientists asking what caused it all.” He also suggested that smoke from oil fires could scavenge ozone in the stratosphere, causing an ozone hole over the Indian sub-continent. However, at least one speaker at the symposium, Basil Butler, a managing director of BP, challenged claims that the war would trigger a climate change which would dry up the monsoons in Asia, leaving a billion people to starve. He did not deny that there would be serious local problems: “We do have a very major problem on our hands to deal with well fires in Kuwait if the wells are mined and the heads blown off by the Iraqis.”⁷⁷

The vast scale of the envisaged environmental catastrophe was used by many as an argument against resorting to war at all as a means of liberating Kuwait. Thus, in much of the political debate of the time, to be environmentally concerned was to predict global catastrophe, and to be anti-war; while those who supported the resort to war said little about the environmental aspects of a possible war. This polarization of the debate had a serious consequence. There was little if any public discussion of the means which might be used, if there was a war, to dissuade Iraq from engaging in environmentally destructive acts; and little if any reference to the laws of war as one possible basis for seeking limitations of this kind.

In the weeks before and after the outbreak of war in January 1991, the British Government examined the possible environmental impact of massive oil fires. On 4 January, the Energy Secretary, John Wakeham, said:

Oil fires of this magnitude would certainly be unpleasant, environmentally harmful and wasteful of energy resources, and if there were a large number it might take over six months to put them all out. But suggestions of a global environmental disaster are entirely misplaced.⁷⁸

In the last days before the war, President Bush tried to impress upon President Hussein the key importance of certain limits. In a letter which Iraqi Foreign Minister Tariq Aziz refused to accept from Secretary of State James Baker at Geneva on Wednesday 9 January 1991, President Bush wrote:

... the United States will not tolerate the use of chemical or biological weapons, support of any kind for terrorist actions, or the destruction of Kuwait’s oil fields and installations. Further, you will be held directly responsible for terrorist actions against any member of the Coalition. The American people would demand the strongest possible response. You and your country will pay a terrible price if you order unconscionable acts of this sort.⁷⁹

VIII. PRE-WAR ROLE OF U.N. SECURITY COUNCIL

In the long period between the Iraqi occupation of Kuwait and the beginning of the war, the U.N. Security Council was unprecedentedly active; but it did

relatively little to focus attention on the need to respect laws of war limitations in the event of an armed conflict; and it did even less about threats to the environment. Security Council Resolution 670 of 25 September 1990, which was basically about sanctions on air transport to Iraq, contained at the end a paragraph in which the Council reaffirmed:

that the Fourth Geneva Convention applies to Kuwait and that as a High Contracting Party to the Convention Iraq is bound to comply fully with all its terms and in particular is liable under the Convention in respect of the grave breaches committed by it, as are individuals who commit or order the commission of grave breaches.

Clearly this related primarily to the occupation of Kuwait, and did not specifically address the matter of limitations which would apply in any war for the liberation of Kuwait.

Security Council Resolution 674 of 29 October 1990 was the most detailed on humanitarian law issues. After repeating the above-quoted passage from Resolution 670, it demanded that Iraq desist from taking third-State nationals hostage, from mistreatment of inhabitants and third-State nationals in Kuwait, and from any other actions in violation, *inter alia*, of Geneva Convention IV. It then indicated that certain violations might be punished: it invited "States to collate substantiated information in their possession or submitted to them on the grave breaches by Iraq . . . and to make this information available to the Security Council;" and it reminded Iraq that it was liable for any loss, damage or injury arising in regard to Kuwait and third States, referring also to the question of financial compensation. However, for all its merits, Resolution 674 did not spell out the principles or rules which would apply in a possible war.

The famous Security Council decision authorizing the use of force — Resolution 678 of 29 November 1990 — said nothing at all about laws of war limits; it was the last resolution before the outbreak of war.

In the circumstances of the time, even the obvious could benefit from reaffirmation, and in addition some matters did need clarification and interpretation. In view of Iraq's cavalier attitude to basic rules, as evidenced for example in the weeks and months after 2 August 1990 by the seizure of hostages and the threats to destroy the oil installations, it was clear that any reminders to Iraqi commanders about limitations in war might need to come from outside. New environmental threats and public environmental concerns strengthened the case for having a clear statement about how environmental destruction ran counter to older as well as newer agreements on the laws of war. Further, in view of the lack of formal applicability of Additional Protocol I in this conflict, it could have been helpful if the U.N. had clarified whether at least some of its underlying principles and basic rules, such as those contained in Articles 35 and 48, were to be applied. The need to harmonize practices among the many members of the Coalition, and

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to be seen to have done so, heightened the case for some U.N. statement on such matters. Fears of U.S. sensitivities about Additional Protocol I might have inhibited some from raising this issue. However, since the U.S. Government had itself many years earlier conceded that the U.S. non-ratification of the Additional Protocol left a gap, it would have been reasonable for the U.N. to have attempted, at least partially, to fill that gap. Although there were precedents from earlier crises for action in this field being taken by the General Assembly, and by the Secretary-General, in 1990-91 the obvious forum for such a role would have been the Security Council.

IX. THE 1991 WAR

A. Initial Coalition Policy Statements

After the start of Operation Desert Storm on the night of 16-17 January 1991, statements by some Coalition governments placed an, albeit limited, emphasis on laws of war issues; but these were mostly of a rather general character, and contained few specific references to the protection of the environment or the avoidance of wanton destruction.

The initial address to the nation by President Bush on the evening of 16 January did specify that targets which U.S. forces were attacking were military in character, but the speech contained no other indication of the limits applicable to the belligerents under the laws of war.⁸⁰

In remarks made on 16-18 January, Richard Cheney, U.S. Secretary of Defense, and Lt. Gen. Chuck Horner, Commander of the U.S. Central Command Air Forces, particularly stressed that the bombing campaign would avoid civilian objects and religious centers. Some of their words on this point echoed the words of Additional Protocol I, Article 48, "the Basic Rule," cited above.

During the war, the U.S. armed forces appear to have placed much emphasis on operating within established legal limits. General Colin Powell, Chairman of the Joint Chiefs of Staff during the war, said subsequently: "Decisions were impacted by legal considerations at every level. Lawyers proved invaluable in the decision-making process."⁸¹

There appear to have been some official American attempts to gag discussion of the environmental effects of the war. On 25 January 1991, researchers at Lawrence Livermore National Laboratory received a memorandum which read in part:

DOE [Department of Energy] Headquarters Public Affairs has requested that all DOE facilities and contractors immediately discontinue any further discussion of war-related research and issues with the media until further notice. The extent of what we are authorized to say about environmental impacts of fires/oil spills in the Middle East follows:

“Most independent studies and experts suggest that the catastrophic predictions in some recent news reports are exaggerated. We are currently reviewing the matter, but these predictions remain speculative and do not warrant any further comment at this time.”⁸²

The British Government, at the start of Operaiton Desert Storm, stressed that the Coalition forces were operating within a framework of legal and moral restraint. Prime Minister John Major told the House of Commons on 17 January:

I also confirm that the instructions that have been given to all the allied pilots are to minimise civilian casualties wherever that is possible, and the targets that they have been instructed to attack are, without exception, military targets or targets of strategic importance.⁸³

At the beginning of the war there do not appear to have been any British Government statements of a general character about the laws of war as they bear on the environment, but such statements were made in February (see below) in the context of condemnations of Iraqi conduct.

B. Iraqi Attacks on Oil Facilities

During the war, many military actions on both sides involved oil targets but were not necessarily seen as war crimes. The Coalition made attempts (occasionally breached) to avoid targeting tankers and commercial oil facilities in Kuwait; but oil depots and refineries in Iraq were viewed as military targets and hit by Coalition bombing. This brief survey concentrates on Iraqi actions, especially in occupied Kuwait.

Soon after the beginning of Operation Desert Storm, the Iraqi forces launched an attack against the Khafji oil storage depot in northern Saudi Arabia, setting it on fire, and reportedly causing leakage of oil into the Gulf. Iraqi forces also caused a much larger slick, reportedly from as early as 19 January, by pumping huge quantities of oil into the Gulf from the Sea Island Terminal, a pumping station for the Mina al Ahmadi crude oil tank farm in Kuwait. This spill was reportedly reduced by Coalition forces accidentally setting the terminal ablaze on the night of 25-6 January; and it was eventually brought under partial control by Coalition bombing of the pumping stations at Mina al Ahmadi on 26 January.⁸⁴

At about the same time, there were also huge spills into the Gulf — again, apparently deliberate Iraqi acts — from Iraqi tankers moored at Mina al Ahmadi. By 24 January, when air reconnaissance in the area was conducted, these ships were apparently empty, or almost empty, of oil.⁸⁵

The total amount of oil spilled into the Gulf almost certainly constituted the largest oil spill ever. Estimates at the time of the total amount of oil ranged up to eleven million or more barrels of crude.⁸⁶ By mid-February, reports of the scale, movement, and likely damage of the oil slicks were slightly less apocalyptic than

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earlier.⁸⁷ The true size of the spill was probably between six and nine million barrels.⁸⁸

The total damage done by the slicks was considerable. By May, over 400 kilometres of the Saudi coast, as well as the southern Kuwaiti coast, was affected. There was damage to coastal marshlands, to wildlife (over 30,000 marine birds killed), to coastal flora, to fishing, and to offshore oil operations.⁸⁹

The massive, indeed in its scale unprecedented, destruction of the oilfields of Kuwait was the most efficiently conducted Iraqi action since the start of the war. It had been carefully prepared. A small group of oil installations in southern Kuwait was set on fire by the Iraqi forces during the first week of the war, evidently as a test.⁹⁰ Then on 21-22 February, just before the Coalition ground offensive began on 23-24 February, Iraq started the program of systematic destruction of Kuwaiti oil installations, casting a huge pall of smoke across the country. Before the flight of Iraqi forces from Kuwait ended on 28 February, they blew up or damaged virtually all the oil installations in Kuwait. 613 wells were set on fire, and 175 others left gushing or damaged. As to the rate of burn, estimates ranged between over two and six million barrels per day.⁹¹

Most of these Iraqi actions regarding oil seem to have had little military rationale. Kuwait later claimed that the environmental devastation was not the result of military conflict, but "the product of a deliberate act that was planned in the very first days of the brutal Iraqi occupation of Kuwait."⁹² Some have speculated that the oil slicks in the Gulf were intended to hamper possible efforts at amphibious landings in Kuwait: however, quite apart from the doubtfully relevant fact that (as emerged later) the Coalition's preparations for such landings were a ruse, it is debatable whether, given their location, the slicks would have seriously hampered any amphibious landings. Oil damage to ships, especially to their cooling systems, could have been serious, but the Coalition powers managed by various means to avoid it.⁹³ As to the burning of the oil wells, there is no evidence that Iraq actually intended to achieve a military effect by this means. However, the huge smoke clouds caused by the fires, and poor weather during the last week of the war, did significantly impede air operations over Kuwait, including reconnaissance and ground attack. As the Pentagon interim report (but not the final one) put it:

The operational impact of oil fires and smoke on the Coalition forces attacking Kuwait City was mixed. Air support was severely hampered. As direction and strength shifted, surface winds initially complicated then ultimately favored Coalition forces by blowing from south to north during the ground offensive.⁹⁴

Thus, while Iraq's releasing of oil and destruction of oilfields had some marginal military effect, or at least potential, there is no evidence that that was the purpose. The Pentagon expressed puzzlement about the purpose.⁹⁵ Almost certainly, Iraq's

motive was less tactical than punitive: to do damage to Kuwait, hurt its adversary and neighbor, and diminish the value of the prize for which the war was supposedly being fought. The fact that only Kuwaiti wells were set alight, and not those on the Iraqi side of the border, confirms this conclusion; as does the fact that explosive charges were used, rather than simple ignition with opened valves.⁹⁶

The Iraqi environmental destruction was heavily criticized by Coalition leaders. Thus, on 25 January, as the extent of the Iraqi oil spill into the Gulf was attracting notice, U.S. officials said that the world had never previously had to deal with a deliberate and malicious spill. President Bush said:

Saddam Hussein continues to amaze the world. First, he uses these Scud missiles that have no military value whatsoever. Then, he uses the lives of prisoners of war, parading them and threatening to use them as shields; obviously, they have been brutalized. And now he resorts to enormous environmental damage in terms of letting loose a lot of oil — no military advantage to him whatsoever in this. It is not going to help him at all... I mean, he clearly is outraging the world.⁹⁷

Richard Cheney accused Saddam Hussein of environmental terrorism, adding: “It is one more piece of evidence, if any more were needed, about the nature of the man himself. He is best described as an international outlaw.”⁹⁸ On 28 January, Michael Heseltine, the British Secretary of State for the Environment, said in a long statement in the House of Commons: “Words are inadequate to condemn the callousness and irresponsibility of the action of Saddam Hussein in deliberately unleashing this environmental catastrophe.”⁹⁹ On 22 February he said in a written answer: “Iraqi action has already led to damage to the environment as indicated by the deliberate release of oil into the Gulf. The Government together with the countries of the OECD has condemned this action as a violation of international law and a crime against the environment.” On the environmental impact of operations by the forces seeking to implement U.N. resolutions, he said: “Environmental factors are taken into account by the Coalition forces as far as possible in the planning and conduct of military operations as part of the policy of ensuring that collateral damage from those operations is minimised.”¹⁰⁰

On 22 February, as the Iraqis began destroying the Kuwaiti oil installations, and on the eve of the Coalition land offensive, President Bush said: “He is wantonly setting fire to and destroying the oil wells, the oil tanks, the export terminals, and other installations of that small country.”¹⁰¹ On the same day, in Riyadh, Brigadier General Richard Neal, Central Command’s Deputy Director of Operations, commented: “It looks like he’s carrying out what he said on several occasions. We’ve had a difficult time trying to figure out the motivation for a lot of his actions.”¹⁰²

The destruction of the oil installations in Kuwait proved to be on the massive scale which some had forecast, the rate of burn-off was actually higher than many

had anticipated, and the consequences were serious. The flood of oil from the wells formed lakes and reportedly affected aquifers. The fires involved huge waste of a valuable natural resource. They spewed many gases, including the 'greenhouse' gas carbon dioxide (perhaps 3 per cent of the world's total annual fossil fuel emissions), into the atmosphere. Heavy metal-laden soot particles and aromatic hydrocarbons contributed to the atmospheric pollution. In Kuwait, in the months after the war, the heavy atmospheric pollution caused an increase in respiratory illnesses, a lowering of regional temperatures, and much damage to the land.¹⁰³ The smoke was widely reported as having adverse effects in neighboring countries, including Iran and Saudi Arabia, and in the waters of the Gulf. There were reports of black rain in Turkey, Iran and the Himalayas. However, the harmful effects of the oil fires were mainly regional, and were nothing like the global disaster which some had forecast. Soot from the fires does not appear to have risen high enough to cause the global environmental effects which some had feared. There was no demonstrable effect on the climate outside the Persian Gulf region, and no demonstrable influence on the Indian monsoon.¹⁰⁴

The Iraqi actions—the discharge of oil into the Gulf, and the burning of the Kuwaiti oilfields—were plainly contrary to the laws of war. There has been general agreement that they violated Article 23 (g) of the 1907 Hague Regulations. It is also widely accepted that they violated Article 147 of Geneva Convention IV; and also Article 53, which is in the section on occupied territories. Whether the Iraqi actions would have constituted violations of two conventions which mention the environment—the 1977 ENMOD Convention, and Additional Protocol I—neither of which was in force in the 1991 Gulf War, is a more contentious matter.

As regards ENMOD, a key question would be: was Iraq, to use the language of Article II, “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”? It might well be asserted that this was, rather, a case of the deliberate abuse of man-made installations and artificial processes: of damage *to* the environment, but not necessarily damage *by* the forces of the environment. The terms of ENMOD, as well as the fact that it was not in force in this war, suggest that it had little or no relevance to the Iraqi actions.¹⁰⁵

As regards Articles 35 and 55 of Additional Protocol I, there is perhaps more room for the view that Iraqi actions would have violated these environmental provisions. In its July 1991 Interim Report to Congress, the Pentagon stated that Iraq had committed extensive and premeditated war crimes, which included “unnecessary destruction, as evidenced by the release of oil into the Persian Gulf and the sabotage of hundreds of Kuwaiti oil wells.” It stated that these actions “could implicate a number of customary and conventional international law

principles,” including from the 1907 Hague Regulations and 1949 Geneva Convention IV, and further mentioned in its list Articles 35 and 55 of Additional Protocol I.¹⁰⁶ However, the Pentagon’s April 1992 Final Report, while continuing to assert the illegality of Iraqi actions, was much more dismissive of the Protocol’s relevance, especially in the following:

Even had Protocol I been in force, there were questions as to whether the Iraqi actions would have violated its environmental provisions. During that treaty’s negotiation, there was general agreement that one of its criteria for determining whether a violation had taken place (“long-term”) was measured in decades. It is not clear the damage Iraq caused, while severe in the layman’s sense of the term, would meet the technical-legal use of that term in Protocol I. The prohibitions on damage to the environment contained in Protocol I were not intended to prohibit battlefield damage caused by conventional operations and, in all likelihood, would not apply to Iraq’s actions in the Persian Gulf War.¹⁰⁷

This passage is likely to provoke criticism, especially for its characterization of Iraqi actions and their consequences. Yet the fact that there is scope for debate about the relevance of the environmental provisions of Additional Protocol I (and also of ENMOD) confirms the importance of earlier provisions, including from the 1907 Hague Regulations and 1949 Geneva Convention IV: these were a key basis for judging Iraqi actions.

C. Coalition Military Actions

Many Coalition actions in the crisis had environmental consequences, even if they were on a lesser scale than those caused by their adversaries. Further, some actions which they did not take could have affected the environment. In the months before the war, when U.N. Security Council sanctions were imposed on Iraq, there were some proposals that Iraq might be defeated by stopping the flow of the Tigris and Euphrates (both of which originate in Turkey): these were not implemented, for reasons that can be guessed but are not definitely known.¹⁰⁸

Of all the actions which were taken by the Coalition, that which has attracted most attention as regards environmental consequences is the bombing of Iraq. Many objects which were attacked, such as oil storage sites, power stations, and warehouses, provided for the needs of both the armed forces and the civilian population. It must be doubtful whether it is possible to embark on a policy of damaging the military function of such targets without at the same time doing harm to the civilian population and/or the environment; and so it proved in this case. In March 1991, in the immediate aftermath of the war, a controversial report submitted to the United Nations by Martti Ahtisaari, the Finnish head of a special investigative commission, deplored the devastation of Iraq. It noted the destruction of non-military objectives in Iraq—for example, a seed warehouse, and a plant producing veterinary vaccines—and it said that “all electrically operated

installations have ceased to function,” causing shortages and contamination of the water supply.¹⁰⁹ The damage to facilities serving Iraqi civilian life was serious, and was notably criticized in a report by Middle East Watch.¹¹⁰ Some other reports in the aftermath of the war were less negative.¹¹¹ In the present state of the law, a verdict that the bombing policy in general was illegal would be hard to sustain. However, Oscar Schachter’s judgement is worth noting: “The enormous devastation that did result from the massive aerial attacks suggests that the legal standards of distinction and proportionality did not have much practical effect.”¹¹²

The coalition attacks on nuclear facilities in Iraq raised worries that there might be substantial release of radioactive materials, causing local environmental damage. Because, as is now known, Iraq had removed its nuclear materials and buried them off-site, such release appears to have been minor. The question remains, whether attacks on facilities containing nuclear materials would be contrary to the laws of war. There appears to be no absolute answer. The problem comes closest to being addressed in Additional Protocol I, Article 56, on ‘Works and installations containing dangerous forces’. However, this is of limited relevance because, as noted above, (a) it is not accepted as part of customary law; and (b) it deals with ‘nuclear electrical generating stations’, but does not appear to address the types of nuclear installation actually attacked in Iraq. Even if the targets had been nuclear electrical generating stations, attack is only prohibited (and then incompletely) “if such attack may cause the release of dangerous forces and consequent severe losses among the civilian population.” If attack does take place, “all practical precautions shall be taken to avoid the release of the dangerous forces.” These formulae leave much to the judgement and skill of the attackers; and confirm that there are, inevitably, many loose ends left by the negotiators who concluded Additional Protocol I. Clearly, attacks on nuclear installations risk very serious consequences, and require very special reasons and precautions; but in the present state of the law it cannot be said that they are always prohibited.¹¹³

A strong defense of the Coalition bombing policy generally can be made along the lines that it was aimed at targets which had some military relevance, was conducted with unusual precision, and any damage which was outside the proper military purposes of the war was accidental or collateral in character. These points were emphasized by Tom King MP, Secretary of State for Defence, in evidence to the Defence Committee of the House of Commons on 6 March 1991. He stated categorically that water pumping plants in Baghdad had not been a target, though their operations had inevitably suffered from the attacks on electrical power-generating stations; and he said that nuclear reactors were only attacked “after the most detailed planning to minimise the risk of any radiation spreading outside the site.”¹¹⁴ The account of the war in the British Defense white paper makes the same point:

There was evidence too that Iraq had been seeking to develop nuclear and biological weapons. The allies therefore placed great importance on deterring Iraq from using any such weapons. Alliance leaders made it clear they would take the gravest view of any Iraqi use of weapons of mass destruction. Production and development facilities were attacked with precision-guided munitions using tactics designed to minimise any risk of contamination outside the sites.¹¹⁵

Similarly, the Pentagon's reports to the U.S. Congress in July 1991 and April 1992 say of the bombing campaign that aircraft and munitions were carefully selected to achieve "the least risk to civilian objects and the civilian population."¹¹⁶

Taking the Coalition bombing campaign overall, and making full allowance for the inadequate state of current information about its effects, it does appear that such Coalition actions as damaged the environment were less wanton and gratuitous than the Iraqi oil crimes in Kuwait, and that some, but only some, significant efforts were made to avoid or reduce certain kinds of environmental damage. However, the allied actions serve as an uncomfortable reminder that prohibiting or reducing the environmental damage of war is not a simple task.

D. Remnants of War

The dangerous effects of remnants of war have long been a cause of concern, including to the United Nations.¹¹⁷ Such acts as the laying of mines without keeping careful plans violate basic principles of the laws of war on several grounds. They pose a serious risk to innocent human life, even after the end of a war, and they may degrade the environment in a lasting way. Moreover, attempts to make the land environment safe again are liable to cost a great deal of money, human effort, and lives.

The 1991 Gulf War left the land littered with the remnants of war. There were trenches of oil on the frontier with Saudi Arabia, prepared by Iraqi forces to frustrate a Coalition invasion; and pools of oil near the destroyed oil installations. Iraqi forces reportedly laid more than 500,000 mines in Kuwait, and abandoned quantities of ammunition. As to the Coalition, as many as one third of its bombs and projectiles reportedly failed to detonate, the soft sand and the use of stockpiled or experimental weapons increasing the failure rate; and many U.S. anti-personnel submunitions, dropped into the battle area, remained a lethal hazard afterwards.¹¹⁸ Substantial quantities of depleted uranium, which is toxic and mildly radioactive, remained littered around the battlefield; it had been used for armor piercing both in tank ammunition, and in bullets fired from aircraft. Its use caused concern both because of possible health consequences for soldiers exposed to it during the war, and because the remnants may constitute a health hazard in post-war Kuwait and Iraq.¹¹⁹

Some less-publicized aspects of environmental damage were potentially serious. According to some accounts, the movements of armored vehicles over the desert

landscape of Saudi Arabia, Kuwait and Iraq in the months of crisis and war left the desert surface looser than before, and may have increased the likelihood of severe sandstorms.

E. 'Gulf War Syndrome'

After the war, a number of people who had served in the war zone developed a variety of symptoms, some of which came to be grouped under one heading as "Gulf War syndrome." Various possible causes were mentioned, including some of the antidotes which had been administered (in injection and pill form) to reduce vulnerability to possible Iraqi use of chemical and biological weapons. Environmental factors were also mentioned as one possible type of explanation of at least some of the symptoms; it was suggested that the servicemen concerned had been exposed to dangerous chemicals, including possibly remnants of certain Iraqi chemical weapons deployed in Kuwait. Law suits and detailed investigations were undertaken in both the U.S. and U.K. On 27 July 1995 the Royal College of Physicians gave its official backing for further investigation into "Gulf War syndrome," the alleged war-related illness affecting more than 600 U.K. veterans (out of a total U.K. contingent of about 51,000) who served in the 1991 conflict. However, at the same time, the College concluded, on the basis of a clinical assessment of the medical checks on 200 veterans completed by the Ministry of Defence, that there was no single cause for the variety of illnesses suffered by the servicemen and women who had been examined.¹²⁰

X. ACTION TO PROTECT THE ENVIRONMENT DURING AND AFTER THE WAR

During and after the war, the tackling of major environmental hazards in the whole area of the conflict involved difficult problems of diagnosis, prescription, organization and international cooperation.

There was much action to limit the effects of the oil spills in the Gulf. During the war, the U.S. Government (apart from its successful bombing on 26 January) took some effective action on an inter-agency basis. A huge containment and recovery effort was made by Saudi Arabia's Meteorology and Environmental Protection Administration and by the International Maritime Organization. Under auspices of the U.N. Environment Programme and the Regional Organization for the Protection of the Marine Environment (ROPME), a special oil clean-up ship, the *Ali-Wasit*, recovered 500,000 barrels of oil from the Gulf. Altogether, some two million barrels of oil were recovered.¹²¹ A serious threat to the world's largest desalination plant, at al Jubayl in Saudi Arabia, was effectively countered by booms, nets and skimmers. Efforts were concentrated on protecting industrial and desalination plants, rather than on environmentally sensitive areas. There was much dispute over appropriate methods of tackling this and similar

disasters.¹²² Although a thick tarry layer remained in the sands of the Saudi coast, the waters and wildlife of the Gulf made an impressive recovery, confirming to some observers the remarkable capacity of nature to survive disasters.¹²³

As to the oil fires in Kuwait, there was debate about the adequacy of preparations during the war, by either the U.S. Government or the Kuwaiti Government in exile, to prepare for putting them out; and afterwards, the U.S. administration seemed to down-play the impact of the fires — perhaps because it wanted neither to seem obsessed about oil, nor to raise any doubts about the wisdom of a war which left such a pall.¹²⁴ After a slow start, work on controlling the oil fires gathered pace: the last fire was extinguished on 6 November 1991. There were inevitably missed opportunities, and many lessons to be learned from this episode so far as future oil fire disasters are concerned.¹²⁵ In 1992 there was criticism of the Kuwaiti authorities for further damaging the wells by rushing to bring them back on stream before they had time to recover.¹²⁶

Numerous other aspects of the clean-up operations posed problems. In Kuwait, huge quantities of oil remained on the surface even after the fires were put out; some of this was effectively recovered. The most serious problem was unexploded weapons, including mines. In less than a year after the war, explosive ordnance reportedly killed or wounded some 1,250 civilians, and claimed fifty lives of demolition specialists.¹²⁶

International bodies played a significant part in the clean-up efforts after the war. Under the auspices of the U.N. Environment Program (UNEP), a Plan of Action was drawn up to address the consequences of the conflict on the marine, coastal, atmospheric and terrestrial environments, and also the subject of hazardous waste in the region. This was adopted for implementation by the Council of ROPME on 16-17 October 1991. UNEP continued to play an important part in coordinating the efforts of the U.N. and other international organizations to assess the effects of the conflict, and to mobilize funds for assessment and rehabilitation programmes.¹²⁸

The aftermath of the war confirmed the need for governments and armed forces to take much more seriously the whole problem of limiting the effect of war on the environment, and putting right the damage that is done. Some problems of a very widespread character, not exclusively linked to the 1991 Gulf War, were addressed. For example, on 21 May 1993, the UNEP Governing Council approved a decision asking governments to establish a national environmental policy for the military sector, and requesting the Executive Director to report on the application of environmental norms for the treatment and disposal of hazardous wastes by military establishments.¹²⁹

XI. POST-WAR LEGAL DEVELOPMENTS

A. The Question of Iraqi Responsibility

After the war, the U.N. Security Council held Iraq responsible for the damage caused by the invasion and occupation of Kuwait.¹³⁰ Resolution 686 of 2 March 1991 demanded that Iraq “accept in principle its liability under international law for any loss, damage, or injury arising in regard to Kuwait and third States, and their nationals and corporations, as a result of the invasion and illegal occupation of Kuwait by Iraq.” It also required Iraq to “provide all information and assistance in identifying Iraqi mines, booby traps and other explosives as well as any chemical and biological weapons and material in Kuwait. . . .”

Resolution 687 of 3 April 1991 — the longest ever passed by the Security Council — contained many provisions relevant to the environment. It reaffirmed that Iraq “is liable under international law for any direct loss, damage, including environmental 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.” Further, stringent measures of disarmament — especially in the chemical, biological, missile, and nuclear fields — were imposed on Iraq by that and subsequent resolutions. Iraq was invited to affirm unconditionally its existing obligations under certain treaties, and to ratify the 1972 Biological Weapons Convention.¹³¹

Despite the above-mentioned resolutions, after the cease-fire almost nothing was heard from the Coalition governments on the subject of the major war crimes, and the personal responsibility of Saddam Hussein and colleagues for them. The Security Council resolutions were silent on the subject. Some Iraqis who had been caught in Kuwait at the end of the war were tried there in summer 1991 for various offenses in connection with the occupation, but the larger issue of the responsibility of the top Iraqi leadership was not addressed by the U.N. The question of Iraqi war crimes obviously embraces the whole range of offenses by Iraq, and not just those relating to the environment. However, the fact that major and wanton environmental damage was apparently going unpunished (except in the broader context of the attempt to secure reparations and compensation from Iraq via the U.N. Compensation Commission set up in 1991) was serious: an opportunity to spell out, in a clear and forceful manner, the criminal nature of certain Iraqi actions, including wanton damage to the environment, was missed. The Security Council’s failure since the war to address the question of war crimes is all the more striking when the explicit reference to such crimes in Resolution 674 of 29 October 1990 is recalled. The reasons why the war crimes issue was not pursued are serious and need to be understood. Six stand out. First, there was wide agreement in the months before January 1991 that if there was to be a war for the liberation of Kuwait, it had to be a limited war for clearly limited and defined

objectives; that being so, the capturing of Saddam Hussein and colleagues, however criminal their acts, would not have easily fitted into the Coalition scheme of things. Second, the Iraqi leaders would have been difficult to arrest even if the Coalition action had been more offensive. Third, there were obvious difficulties in demanding Saddam Hussein's arrest as a war criminal at the same time as negotiating cease-fire terms with him; and in early March the cease-fire seemed more important. Fourth, there was nervousness in Washington, London, and other Coalition capitals about pressing any proposal for trials if opinion in countries in the region did not want to go down this road. Fifth, there was a question as to whether Iraqi actions before and after this war, including against Kurds and Marsh Arabs, should also be included. And sixth, in many Coalition capitals there was the hope, publicly expressed from the beginning of the war, that some kind of *coup d'état* or revolution within Iraq would solve the problem.¹³²

However, as a minimum, it would have been possible for an authoritative statement to be made promptly, to the effect that major war crimes had occurred, involving *inter alia* grave breaches of the Geneva Conventions; that there was personal responsibility for these crimes; and that under the Geneva Conventions any State was entitled to prosecute. Such a statement would at least have had the effect of making it clear, at a time when interest was high, that Saddam Hussein and colleagues would be exposed to risk of prosecution if they set foot in other countries. It would also have given a little more consistency to the otherwise confusing positions taken by the leading Coalition powers and the Security Council.

The United States did eventually, in a war crimes report prepared under the auspices of the Secretary of the Army in January 1992 and issued by the U.N. in March 1993, put on the record a clear statement about Iraqi war crimes. This report, which was not widely noted at the time or subsequently, includes some references to various Iraqi actions which had a damaging effect on the environment, and treats them as violations of 1907 Hague Convention IV and of 1949 Geneva Convention IV.¹³³

B. Development of International Law

The 1991 Gulf War, like many previous wars, led to much discussion as to whether, and if so how, international law might be developed to address more effectively the problems it had exposed. In particular, there was extensive consideration of the protection of the environment in warfare.

It was widely recognized that one war is too narrow a frame of reference for such discussions. After all, environmental damage in war can take many forms; and non-international armed conflicts must be taken into account. But the war did point to many general problems which needed to be addressed—for example, securing recognition and immunity (whether on the model of the ICRC, or civil

defense or other relief workers) for individuals and organizations concerned with monitoring and controlling environmental damage in peacetime or wartime — from measuring air pollution to rescuing injured wildlife.

Some of the immediate post-war discussion was centered on proposals for a new international treaty. The idea of a possible ‘fifth Geneva Convention’, to address directly the issue of environmental damage in war, was tentatively aired.¹³⁴ However, the weight of opinion among governments and international lawyers favored proceeding by more modest steps, including fuller ratification, exposition, implementation, and development of existing law. Resolutions in various bodies — being a way of enunciating general principles, and relating them to particular problems as they arise — were advocated as one means of assisting such purposes.¹³⁵

After the war, some saw Additional Protocol I as centrally important so far as the protection of the environment in war is concerned. For example, a consultation in Munich in December 1991, mainly of environmental lawyers, began its final statement with the following recommendations:

1. The Experts Group strongly urged universal acceptance of existing international legal instruments, in particular of the 1977 Protocol ...
2. The Group observed that the current recognition that the environment itself is an object of legal protection in times of armed conflict implies that traditional perceptions of proportionality and military necessity have become obsolete.¹³⁶

Although the Munich meeting also highlighted the importance of customary norms prohibiting devastation, it is doubtful whether it was wise to put such great emphasis on Additional Protocol I, and to go so far in rejecting certain other aspects of the laws of war, including traditional perceptions of proportionality.

The International Committee of the Red Cross was, not surprisingly, a main vehicle for taking forward the question of the effect of war on the environment. The ICRC gave consideration to this in the run-up to the XXVIth International Conference of the Red Cross and Red Crescent, which had been due to be held in Budapest in November 1991, but had to be postponed.¹³⁷ A draft resolution for the conference had, like earlier ICRC pronouncements, put great and perhaps disproportionate emphasis on Additional Protocol I. The resolution stated, *inter alia*, that the conference:

[C]alls on States which have not yet acceded to or ratified the international treaties containing provisions for the protection of the environment in time of armed conflict rapidly to consider becoming party thereto, [and]

[E]ncourages the ICRC, in co-operation with the organizations concerned, to examine the contents, limitations and possible shortcomings of the international rules for the

protection of the environment in time of armed conflict and to make proposals in that respect...¹³⁸

The U.N. General Assembly has supported such an approach. In December 1991, it suggested further consideration of the matter in conjunction with the ICRC.¹³⁹ The ICRC then convened a meeting of experts on the protection of the environment in time of armed conflict, held in Geneva in April 1992, and on 30 June submitted an 18-page report to the U.N. General Assembly. This emphasized the need to observe existing law in this area, and the ICRC's continued willingness to address the issue. It also identified a number of issues for further research and action.¹⁴⁰ This was one input into ongoing discussions in the Sixth Committee, resulting in a November 1992 resolution which was the General Assembly's most important pronouncement on the subject. It recognized the importance of the 1907 Hague Convention IV and the 1949 Geneva Convention IV, as well as later agreements. It stated unambiguously in its preamble "that destruction of the environment, not justified by military necessity and carried out wantonly, is clearly contrary to existing international law," and then in its operational part said that the General Assembly:

1. *Urges* States to take all measures to ensure compliance with the existing international law applicable to the protection of the environment in times of armed conflict;
2. *Appeals* to all States that have not yet done so to consider becoming parties to the relevant international conventions;
3. *Urges* States to take steps to incorporate the provisions of international law applicable to the protection of the environment into their military manuals and to ensure that they are effectively disseminated.¹⁴¹

Meanwhile, Principle 24 of the Rio Declaration of June 1992 had offered the anodyne formula, which was evidence of international concern but did not advance things significantly:

Warfare is inherently destructive of sustainable development. States shall therefore respect international law providing protection for the environment in times of armed conflict and cooperate in its further development, as necessary.¹⁴²

After 1992, the General Assembly continued to be seized of the protection of the environment in times of armed conflict, but simply as one part of the agenda item "U.N. Decade of International Law." It remained content to express support for work done under ICRC auspices. The ICRC convened two further meetings of experts, in January and June 1993, which led to a new report defining the content of existing law, identifying problems of implementation, suggesting what action

needed to be taken, and drawing up model guidelines for military manuals.¹⁴³ The General Assembly particularly supported the ICRC on this last point.¹⁴⁴

XII. GENERAL ISSUES AND CONCLUSIONS

One war is too narrow a frame of reference for making hard and fast observations on the perennial and multi-faceted subject of the impact of war on the environment. Environmentalists and lawyers may, like generals, be open to the accusation of always fighting the last war. Vietnam produced very different environmental problems, and so will future wars. Both in peace and war, environmental damage can take many forms; can be very hard to forecast beforehand and to assess afterwards; can be prevented or reduced by a bewildering variety of different means; and is sometimes hard to rectify once it has happened.

However, the environmental issues raised by the 1991 Gulf War were of sufficient seriousness that they must form part of any attempt at overall assessment of how damage to the environment in war can be effectively limited. This statement by a Kuwaiti woman in late 1991 commands respect: "We won the ground war, we won the air war, but we lost the environmental war."¹⁴⁵ The 1991 Gulf War saw what were arguably the worst acts of deliberate environmental destruction of any war in this century. It also showed, in a more general way, how modern war involves a wide range of hazards to the human and natural environment; and how an increased level of concern with environmental issues, especially in Western societies, can influence public views about the legitimacy of certain military activities. The war, in short, saw new manifestations of problems relating to the environment which are likely to get more serious as societies develop.

A. Illegality of Certain Acts of Environmental Destruction

In warfare, actions damaging to the environment, when associated with wanton destruction not justified by military necessity, are contrary to well established and universally binding parts of the laws of war. Prohibitions of wanton destruction in major treaties, including the 1907 Hague Regulations and the 1949 Geneva Conventions, have a strong bearing on the environment, as do the underlying principles of the laws of war, evidence from past practice and trials, and certain customary rules. The environmental provisions in the ENMOD Convention, and in Additional Protocol I, should be seen as essentially supplementing these fundamental sources — and in the case of ENMOD as covering such special cases as the use of rain-making or defoliation techniques — rather than as constituting the core of the laws of war rules regarding the environment. As for the large body of general (peacetime) international law relating to aspects of the environment, decision-makers and commanders may be expected to pay due regard to its

provisions; and there is a need for a factual and pragmatic examination of how this body of law has in fact operated during armed conflicts.

B. Certain Iraqi Actions as Violations of the Laws of War

There is no serious disagreement with the proposition that, during the 1990-91 Gulf Conflict, the laws of war were violated by much Iraqi action of an environmentally damaging kind: the indiscriminate laying of mines, the creation of huge oil slicks, and the wanton destruction of oil facilities in the occupied territory of Kuwait. The Iraqi Government undoubtedly deserves the lion's share of blame for the environmental destruction, as it does for so much else in this war. Even if the point had not been stated beforehand as authoritatively, clearly and frequently as might have been wished, the Iraqi leaders should not have been in doubt that the environmental destruction in which they engaged was a violation of international law.

C. Did New Weapons Systems Cause Environmental Problems?

Some modern weaponry used in the war appears to have caused problems of an environmental character, mainly after the end of the war, to people in the former war zones. Unexploded cluster-bombs and depleted uranium armor-penetrators, are cases in point. Mines constituted a more old fashioned but perhaps more deadly threat. The Coalition bombing campaign involved use of some new weaponry to attack targets in Iraq, but in many cases this assisted accuracy and reduced collateral damage.

The most environmentally questionable acts in this war were not caused by new or especially deadly weaponry, but by selecting as targets sensitive installations—including oil installations and nuclear reactors. On the Iraqi side, the attacks on oil installations were not so much acts of combat as wanton destruction of property in occupied territory.

D. Why did Iraq Engage in Widespread Destruction?

Various reasons, both military and psycho-pathological, have been advanced to explain Iraq's wanton acts of destruction. Some elementary considerations deserve mention. First and foremost, Iraq simply wanted to destroy Kuwait if it could not control it. Retreating aggressors do often engage in wholesale destruction of the territory they had occupied—a fact which underscores the importance the international community attaches to rules against wanton (including environmentally damaging) destruction. The less powerful side in a war is often the side most tempted to resort to desperate expedients, even if those expedients involve an element of self-destruction, and offer no serious hope of turning defeat into victory. The desire to deny a victor the fruits of war, common enough anyway,

would have been reinforced if the Iraqi leadership believed its own propaganda to the effect that it was for the sake of oil that the U.S. went to Kuwait's rescue.

On a more fundamental level, Iraq's sense of alienation from international society—the product of a particular and in many ways debatable interpretation of its own history—made matters worse. Iraq (which was far from alone in this) had not incorporated into its martial ethos or military training the whole range of laws of war provisions to which it was bound by treaty. Further, Saddam Hussein may well have learned a terrible lesson from the Iran-Iraq war of 1980-88. From the international community's failure to react to the original attack on Iran in 1980, and from its failure to do anything much about Iraq's use of gas, he doubtless concluded that he could ignore international law and institutions with impunity. In addition, the occupation of Kuwait and the subsequent war took place against the background of the Israeli occupation of the West Bank, Gaza, and the Golan Heights—an occupation which was 23 years old in the summer of 1990. Rightly or wrongly, many Arabs saw the Israeli occupation as proof of the inefficacy or bias of international legal institutions. This may have contributed to Iraq's and the PLO's reckless disregard of international legal restraints in the crisis over Kuwait.

E. Did the Coalition Do Enough to Prevent Environmental Destruction?

A key question raised by the environmental destruction in this war (as also by the Iraqi use of hostages and treatment of prisoners of war) is how to secure understanding and implementation of existing law. In particular, how is the international community to respond before, during and after a war, when one belligerent apparently rejects basic provisions of the laws of war and/or appears unconcerned about environmental issues?

The Coalition powers did take laws of war issues, and environmental considerations, into account in many aspects of their actions. However, many problems remained. Attacks on such military targets as electric generating stations in Iraq had serious effects on water and sewage systems, leading to disease and loss of life. In addition, significant possibilities of emphasizing the laws of war as a means of inducing restraint between the belligerents may have been missed, especially in the field of environmental destruction.

At the start of Operation Desert Storm in January, should there have been a public statement from the Coalition about what international agreements, provisions and principles relating to the laws of war were beyond question in force? While there would have been hazards in such a course, Iraq did need reminding of its obligations; and different participants in the Coalition were in some cases bound by different treaties, so there were possibilities of inter-allied confusion.

In particular, it is remarkable that the Coalition powers apparently did not take further the warning against destruction of Kuwait's oilfields and installations that

had been contained in President Bush's letter to Saddam Hussein—the letter rejected at Geneva on 9 January 1991. It may be that on this, as on other matters relating to the 1991 Gulf War, much important activity was not in the public domain and will only emerge slowly and belatedly. The Pentagon's Interim Report said:

Means to deter or restrict Saddam's capability to inflict environmental damage were limited. Assessments weighed whether aerial bombardment by the Coalition of key Kuwaiti facilities prior to Iraqi sabotage might cause more damage than it prevented or provoke the Iraqis to embark on an even more widespread campaign.¹⁴⁶

This leaves it unclear how much consideration, if any, was given to the possibility of a serious effort—by major statements, by broadcast, and by leaflet—to spell out in advance to Iraqi officers at all levels the criminality of setting fire to oil wells out of vengeance, the personal responsibility they would bear if they participated in such acts, and the possibility of a tough response by the Coalition if Iraq persisted in such destruction. Of the millions of leaflets dropped by the Coalition powers on Iraqi forces, none discouraged environmental destruction.

There must be scepticism as to whether a clearer enunciation of the law, coupled with statements on the consequences of violating it, would have stopped Saddam Hussein or those under him in their environmentally destructive tracks. After all, the rules on the treatment of inhabitants of occupied Kuwait, and on treatment of prisoners of war, were perfectly clear, but this did not stop Iraq from cruelly mistreating such people and ignoring some of the most basic provisions of the 1949 Geneva Conventions. There can be no certainty that a stronger effort to impress on the Iraqi Government or Iraqi officers the illegality of environmental destruction would have worked; but it might have been worth trying.

The problem of inducing Iraqi restraint in the matter of environmental damage was in some ways similar to the problem of preventing Iraqi use of gas and chemical warfare. Both issues involved international legal standards. Both also raised the questions of how to actively deter criminal Iraqi action; and of how to ensure that Iraqi commanders at all levels were fully aware of their personal responsibility, and liability, for any violations.

The Coalition powers did make a serious and successful effort to dissuade Iraq from resorting to gas and chemical weapons. On the basis of the succinct prohibition of gas and chemical warfare in the 1925 Geneva Gas Protocol, they confirmed the illegality of resorting to such means, and adopted a strong deterrent posture, repeatedly threatening severe retaliation if such weapons were used. They took a similar line regarding nuclear and biological weapons, with special emphasis on destruction of Iraq's capacity.¹⁴⁷ In respect of the environment, their efforts do not appear to have been so consistent or successful. During this crisis, at least until the point where Saddam Hussein's environmental threats began to

be carried out on a large scale, there were few authoritative statements on the illegality of acts of wanton destruction causing massive environmental damage.

There are several possible explanations for what appears to have been a failure of the Coalition governments to make serious efforts to dissuade Iraq from wanton environmental destruction. In some countries, including the U.S. and U.K., it is possible that there may have been some residual elements of doubt as to whether such destruction was unambiguously against the written laws of war as they were in force in the Gulf, especially bearing in mind that none of the three laws of war treaties mentioning the environment by name was technically in force in this war. At all events, there was no short and undisputed text to be cited. It probably did not help that the Coalition leader, the U.S., had in the preceding years expressed criticisms of Additional Protocol I in general, and also, occasionally, of its environmental rules in particular.

The second, and more likely, explanation has to do with the urgency of other claims on the attention of the Coalition governments and armed forces, especially those of the U.S. They had more immediate worries: the ever-present possibility of gas, biological or even nuclear weapons being used against Coalition troops; the nightly Scud missile attacks on Israel and Saudi Arabia—in the former case posing the risk of the war getting out of hand; mistreatment of their prisoners in Iraqi hands; and the threat of terrorist attacks beyond the region. It is not surprising, even if it is regrettable, that environmental hazards, whose effects would be slower to develop, and which did not pose a threat to the Coalition's prosecution of the war, did not feature so prominently in governmental decision-making on the Coalition side. Allied governments might have been especially reluctant to get into a confused and dangerous process of threats and reprisals in respect of environmental damage, wanting perhaps to reserve their retaliatory threats as counters to more immediately worrying Iraqi actions. This raises the disturbing possibility that in war it is always likely to be so: there will always be more pressing issues than long-term protection of the environment. Often in life the important yields to the urgent.

A third possible level of explanation is that of the military mind-set. Military staffs may simply have lacked the training and mental framework to consider environmental damage as a major issue to be addressed in the planning and conduct of war. Overall, the performance of the Coalition side in the 1991 Gulf War and other recent wars suggests that any such military mind-set is slowly changing in favor of a greater awareness of the salience of environmental issues.

Further, it so happened in this war that issues which were environmental, idealistic and green (avoid fouling up the air and the waters) were also materialist and capitalist (avoid destruction of the oilfields and installations); the Coalition governments, anxious to demonstrate to their domestic and international critics

that this was not just a war for oil, may have been inhibited about placing heavy emphasis on the protection of the oilfields and installations.

F. Did Environmentalists Weaken Their Own Case?

Environmental organizations and individuals played a prominent part in debates before, during, and after the war. They did much to focus attention of the adverse environmental effects of the war, and to stimulate clean-up and preventive measures of various kinds. However, some of the approaches taken by some environmentalists may have weakened their own case, and illustrated certain hazards of single-issue campaigning.

First, in the weeks and months before the outbreak of war in January 1991, environmental hazards had been raised as a reason for not resorting to war at all, rather than as a reason for trying to get some restraint in the conduct of the war. Some environmentalists appeared reluctant to concede the possibility that ecological factors might have to be balanced against other powerful considerations, such as prevention of aggression, or maintenance of the credibility of international institutions. Almost all of those expressing concern about environmental hazards, being reluctant to contemplate war at all, had failed to make specific proposals of a kind which might have helped to limit any war which did occur.

Second, the tendency of some environmentalists in the weeks before the outbreak of the 1991 Gulf War to forecast utter environmental catastrophe on a global scale may have reduced their credibility and effectiveness. Prophecies of doom should be used sparingly if they are to have any credibility. In any event, although the oil spills and destruction of oil wells were at least of the magnitude forecast, the actual damage was local, mainly in Kuwait but also in Iraq and in other States which border on the Gulf. The Iraqi actions in respect of oil were criminal more because they were a stupid waste of good resources and caused extensive local damage than because they threatened the planet with catastrophic climate change. Further, a main environmental threat, the indiscriminate laying of mines, was also limited in scope rather than apocalyptic.

Third, to the extent that environmentalists and others put emphasis on Additional Protocol I, they may have had the effect of underplaying the significance of those earlier rules, from 1907 and 1949, which were a sounder basis for asserting the illegality of the Iraqi actions. It was unfortunate that Iraqi threats to set fire to oilwells and release oil on land and at sea were discussed in terms of a threat to the environment, rather than in the legally safer terms of wanton destruction.

G. Failure on Laws of War Issues at the United Nations

The U. N. did little, either before and during the war, to spell out in a clear and comprehensive way the laws of war rules which applied to the Iraqi occupation of

Kuwait, and which would apply to any war between the Coalition and Iraq. This was true of the Security Council, of the Secretariat, and also of the General Assembly, whose work on laws of war matters during this particular crisis (in marked contrast to some other conflicts) was practically non-existent.

There was no formal obligation on any part of the U.N. system, or indeed on the Coalition, to spell out publicly how laws of war would apply in this occupation and conflict. The difficulties of doing so in any detail are obvious. Others, including the ICRC, could and did perform this task. Yet there is bound to be an argument that this omission on the part of the U.N. was serious, especially so far as environmental issues were concerned. Iraq had already made environmental threats by September 1990: an authoritative clarification of the existing law (or at least its broad principles) by an international body representing governments would have done no harm and might even have been helpful.

H. Additional Protocol I After the 1991 Gulf War

The experience of the 1991 Gulf War raised questions about the desirability and adequacy of the provisions of Additional Protocol I, and about whether it should be ratified by those States which have hitherto held back. These questions are numerous and complex; only a few relating to the environment are mentioned here.

Of the three laws of war agreements concluded in 1977-81 which mention the environment, Additional Protocol I is the most important overall, and the most relevant to the facts of this war. However, Articles 35 and 55, with their specific provisions on the environment, would have been of limited relevance even if the treaty had been in full force. It is unnecessary to seek authority from these articles to assert the illegality of the particular oil-related crimes committed by Iraq in occupied Kuwait. The Iraqi actions were wanton destruction rather than a method of warfare; and they failed tests of military necessity and proportionality.

Does Additional Protocol I, in Articles 35 and 55, establish too high a threshold for environmental damage? As noted earlier, the Pentagon's Final Report went so far as to question whether the huge environmental damage inflicted by Iraq actually constituted those "methods or means of warfare which are intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment" which are prohibited in the Protocol. Certainly the requirement that environmental damage must be "long-term," if this continues to be measured in decades, will limit the utility of the Protocol's environmental provisions. Indeed, in many situations other provisions of the Protocol, including those protecting civilian objects, probably have more relevance to environmental protection. It is not surprising that in these circumstances there have been suggestions that the terms "widespread, long-term and severe" in the Protocol

“belong to earlier concepts of environmental protection” and need to be re-interpreted or revised.¹⁴⁸

If Additional Protocol I had been in force, would the general Coalition war effort have been hampered? A considered U.S. or U.K. military evaluation of this question would be bound to expose a wide range of problems. The war did undoubtedly throw into relief certain weaknesses in the Protocol. For example, the prohibitions on reprisals in Articles 51-56 are very sweeping, and raise the question whether powers should rule out in advance almost all right of reprisal when they are fighting an adversary with so little regard for legality as Saddam Hussein. However, as far as environmental issues are concerned, the prohibitions on reprisals may not be a problem, as it is hard to know what reprisals are appropriate in respect of environmental damage. The provisions of Article 54, on protection of objects indispensable to the survival of the civilian population, could have been cited in criticism of some Coalition bombing actions in Iraq: no bad thing, some would say, if it clarifies restraints on belligerents, and assists an informed debate about the principles of targeting. As regards Article 56, on protection of works and installations containing dangerous forces, the position is perhaps simpler: despite a few interpretations to the contrary, and for the reasons cited earlier, this article does not place a prohibition on attacks on the kinds of nuclear installations actually hit by the United States in the course of the war. Overall, the events of the war suggested the relevance and utility of many of the general principles and detailed provisions of Additional Protocol I.

In the event that some States, including possibly the U.S., remain unwilling to ratify the Protocol, there will be a need to fill the gap by giving what has long been promised, “some alternative clear indication of which rules they consider binding or otherwise propose to observe.”¹⁴⁹ Despite the impressive work done in the crisis to bring the laws of war to bear on the actions of the U.S. and Coalition forces, the war did highlight the gap in U.S. policy towards the laws of war which was already evident. If the gap cannot be filled by ratification, then the “alternative clear indication” which is needed will have, among other things, to address matters relating to the environment. Revised military manuals, harmonized as far as possible with those of other countries, are a promising way of filling such a gap.

J. Proposals for New Convention on War and the Environment

The events of the 1991 Gulf War drew attention to the apparent absence of a simple, formally binding, set of rules about the impact of war on the environment. In its immediate aftermath there were, therefore, many serious arguments for some new attempt at codification. Yet there was always a question whether a new treaty was desirable and possible. The existing laws of war do say a lot, indirectly and directly, that bears on damage to the environment; clear and authoritative exposition of this was needed just as much as new legislation.

Negotiation for a new agreement on the environment was increasingly seen as hazardous. Such an attempt could run into fundamentally intractable problems (of which there have already been foretastes in other negotiations) about defining the natural environment; about defining damage to it; about working out exactly which environmentally damaging acts are forbidden; about distinguishing between intentional, collateral, and completely unexpected damage to the environment; about whether certain kinds of destruction, including even scorched earth, might be permissible in certain circumstances, including perhaps to a defending State within its own national territory; about establishing exactly what military-related activities could be permitted in any specially protected environmentally important areas; and about the applicability of existing international norms in non-international armed conflicts. The question of nuclear weapons would inevitably be raised, and it would probably be as hard as ever to bring such weapons within the framework of the laws of war. Other questions would be hardly less awkward. The powers which took part in the Coalition in the 1991 Gulf War, for example, were not about to assert that absolutely all destruction of oil targets was impermissible. They may also have feared that other sensitive issues would be raised in such negotiations.¹⁵⁰

Reliance on the admittedly sparse rules and broad statements of principle already enshrined in many existing accords from 1907 to 1977 may indeed be more productive than aiming for a major new convention. Detailed rules have many advantages, but also weaknesses. They are vulnerable to the passage of time. Indeed, an examination of existing law and practice suggests that, so far as the environment is concerned, there is always a need for interpretation of rules and principles in the light of circumstances and new technical developments. In particular, there is often a need to balance environmental considerations against such factors as the importance of particular military objectives, and the need to save soldiers' lives.

K. Other Courses of Action

In any event, the ICRC, the majority of international lawyers who looked at the matter, and most governments, clearly favored the course that was adopted: not negotiating a new convention, but rather securing authoritative reports, General Assembly resolutions, draft military manuals and so on, drawing together existing principles and provisions in a simple and intelligible way.

This process has already yielded substantial results, including the ICRC/U.N. report of July 1993, and the General Assembly Resolutions in 1992-94.¹⁵¹ However, some legal and practical questions have scarcely begun to be addressed. First, to what extent are peacetime environmental agreements formally applicable, or at least in practice applied, during armed conflicts and military operations? Second, can wartime environmental clean-up efforts (which may involve a wide variety of

highly specialized personnel drawn from different professions) be granted protection comparable, say, to that accorded in the 1949 Geneva Conventions to humanitarian relief efforts? Other issues, too, need further attention, including the lethal legacy of land-mines left by recent wars, and the use and disposal of environmentally harmful substances in weapons.

Overall, the difficulties which arose in the Gulf conflict, especially in matters relating to the environment, suggest that the main problem lies in ensuring that the law which exists is adequately understood, widely ratified, sensibly interpreted, and effectively implemented. The law's purposes, principles and content need to be properly incorporated into the teaching of international law and relations; into military manuals and training; and into the minds and practices of political leaders, diplomats and international civil servants.

Any wars in future decades and centuries are likely to be in areas where there are high chances of the environment being affected. This is mainly because economic development results in the availability of substances (oil, chemicals, and nuclear materials being the most obvious examples) which can very easily be let loose, whether by accident or by design, on the all-too-vulnerable land, air, and water on which we depend; because some parts of the natural environment are becoming more constricted and fragile due to peacetime trends; because much of the environment in which we live (especially water supplies) depend on the smooth running of an infrastructure easily disrupted by war; and also because some weapons (nuclear weapons being only the most extreme case) may themselves have terrible effects on the environment. For all these reasons, the environmental effects of war, dramatized by the 1991 Gulf War, are likely to remain a serious problem. Even if it can never be completely solved, the problem needs to be tackled, not least within a laws of war framework, and more consistently than it was in the Gulf conflict of 1990-91.

Notes

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1. This is an extensively revised and updated version of Roberts, *Failures in Protecting the Environment in the 1990-91 Gulf War*, in *THE GULF WAR 1990-91 IN INTERNATIONAL AND ENGLISH LAW* (Rowe ed. 1993). An earlier draft had been presented at the International Committee of the Red Cross (ICRC) Meeting of Experts on the Protection of the Environment in Time of Armed Conflict, Geneva, 27-29 April 1992. The author also attended the two subsequent ICRC Meetings of Experts in January and June 1993. The participants in these meetings helped me greatly, as has Bill Arkin in 1995.

2. Surveys in 1991-92 reflecting the growing interest: Bouvier, *Protection of the Natural Environment in Time of Armed Conflict*, *Int'l Rev. of the Red Cross*, at no. 285, Nov.-Dec. 1991; articles by Bothe, Dahl and Szasz in *DISARMAMENT*, United Nations, vol. xv, no. 2, 1992, 101-61; and *ENVIRONMENTAL PROTECTION AND THE LAW OF WAR: A 'FIFTH GENEVA' CONVENTION ON THE PROTECTION OF THE ENVIRONMENT IN TIME OF ARMED CONFLICT?* (Plant ed. 1992) (based on the 3 June 1991 London Conference on the Protection of the Environment in Time of Armed Conflict).

3. Protocol I Additional to the Geneva Conventions Relative to the Protection of Victims of International Armed Conflicts, with Annexes, 12 Dec. 1977, *reprinted in* 16 *I.L.M.* 1391 (1977).

4. For one look at a range of issues raised by this occupation and war, see Roberts, *The Laws of War in the 1990-91 Gulf Conflict*, *Int'l Sec.*, Winter 1993/94 at 134-81.

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5. A few examples, from the Book of Deuteronomy to the late 17th Century, are in Green, *The Environment and the Law of Conventional Warfare*, paper for Conference on the Use of the Environment as a Tool of Conventional Warfare, Ottawa, 10-12 July 1991, at 1-2.

6. See especially the characteristic plea for restraint in Book III, Chapter XII, *Moderation in Laying Waste and Similar Things*, in Grotius, *DE JURE BELLA AC PACIS* (1625), (Kelsey trans. 1925), at 745-56. Earlier (in Book III, Chapter IV) Grotius had said that by the law of nations it was forbidden to poison waters, though it might be legitimate to divert a river or cut a spring; *id.*, at 652-53.

7. Best, *The Historical Evolution of Cultural Norms Relating to War and the Environment* in, *CULTURAL NORMS, WAR AND THE ENVIRONMENT*, (Westing ed. 1988), p. 18. He defines the 'anthropogenic environment' as "what humans had wrought from the natural environment"—*e.g.* crops, orchards, herds of livestock, and wells; *ibid* at 20.

8. Cruttwell, *A HISTORY OF THE GREAT WAR 1914-1918*, 1934, 297-98. Norton Griffiths (MP for Wednesbury 1910-18) was awarded "GSO 1st grade on special mission in connection with corn and oil stores in Roumania, 1916," and was also made Commander Grand Star of Roumania; *WHO WAS WHO*, vol. III, (1947), at 560.

9. See, *e.g.* WESTING, *ECOLOGICAL CONSEQUENCES OF THE SECOND INDOCHINA WAR*, (1976).

10. Aldrich, *Prospects for United States Ratification of Additional Protocol I to the 1949 Geneva Conventions*, 85 *A.J.I.L.* 14 (1991).

11. Declaration of the United Nations Conference on the Human Environment, Stockholm, 1972, U.S. Doc. A/Conf. 48/14; *reprinted in* 11 *I.L.M.* 1416 (1972).

12. Rio Declaration on Environment and Development, 1992, U.N. Doc. A/Conf. 151/5/Rev.1, *reprinted in* 31 *I.L.M.* 874 (1992).

13. Antarctic Treaty, 1959, 12 *U.S.T.* 794; *T.I.A.S.* 4780.

14. Treaty Banning Nuclear Weapons Tests in the Atmosphere, in Outer Space and Under Water, 1963, 14 *U.S.T.* 1313; *T.I.A.S.* 5433.

15. Convention on the Prohibition of the Development Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and their Destruction, 1972, 26 *U.S.T.* 583; *T.I.A.S.* 8062.

16. International Convention for the Prevention of Pollution of the Sea by Oil, 1954, 12 *U.S.T.* 2989; *T.I.A.S.* 4900, Art. IV(1)(a). Neither Iraq nor Iran were parties to this treaty at the time of the 1990-91 Gulf Conflict.

17. 1982 United Nations Convention on the Law of the Sea, *reprinted in* 21 *I.L.M.* 1261 (1982).

18. The text of the Kuwait Regional Convention is *reprinted in* 17 *I.L.M.* 511 (1978), and *INTERNATIONAL ENVIRONMENTAL LAW: PRIMARY MATERIALS*, (Molitor ed. 1991) at 273-78. On the clean-up operations and ROPME's part in them, see text at nn. 121 & 128, *infra*.

19. Prof. Vorontsov, USSR Minister of the Environment and Nature Management, Vice-President of the Russian Academy of Natural Sciences, in a fax of 24 May 1991 to Dr. Leopold of Greenpeace International in London; circulated at the 3 June 1991 London Conference, and *reprinted in* *ENVIRONMENTAL PROTECTION AND THE LAW OF WAR*, *supra*, n. 2 at 242.

20. Modern military manuals referring to some or all of these principles include U.S. Department of the Army, *The Law of Land Warfare*, FM 27-10, (1956) at 3-4; United Kingdom, *Manual of Military Law*, Part III, HMSO, (1958), at pp. 1-2; U.S. Department of the Navy, *The Commander's Handbook on the Law of Naval Operations*, NWP 9, (1987), at 5-1. On the history of principles of the laws of war, see particularly JOHNSON, *JUST WAR TRADITION AND THE RESTRAINT OF WAR: A MORAL AND HISTORICAL INQUIRY*, (1981), at 196-228.

21. Falk, *The Environmental Law of War: An Introduction*, in *ENVIRONMENTAL PROTECTION AND THE LAW OF WAR*, *supra* n. 2, at 85.

22. *Id.*, at 16

23. "Because damages to the environment affect the civilian population, they are, under certain circumstances, prohibited." Bothe, *War and Environment*, in *ENCYCLOPAEDIA OF PUBLIC INTERNATIONAL LAW*, vol. 4, (1982) 291.

24. Declaration Renouncing the use of in time of War of Explosive Projectiles under 400 Grammes in Weight; St. Petersburg, 1868, 1 *A.J.I.L.* (Supp.) 95.

25. Hague Convention No. IV Respecting the Laws and Customs of War on Land, 1907, 36 Stat. 2227; *T.S.* 539.

26. The Martens Clause was adopted at the 1899 and 1907 Hague Conferences principally because the powers had not been able to agree on detailed rules on certain problems relating to occupied territories and the treatment of resistance; but the Clause was written in broad terms, and has been widely seen as having a broader application. Its wording is reflected in articles and preambles in a number of subsequent treaties, including the four Geneva Conventions of 1949, Additional Protocols I and II of 1977, and the U.N. Conventional Weapons Convention of 1981.

27. Best, *supra* n. 7, at 20.

28. Hague Convention No. V Respecting the Rights and Duties of Neutral Powers and Persons in Case of War on Land, 1907, 36 Stat. 2310; *T.S.* 540; and Hague Convention No. XIII Concerning the Rights and Duties of Neutral Powers in Naval War, 1907, 36 Stat. 2415; *T.S.* 545.

29. Protocol for the Prohibition on the use in War of Asphyxiating, Poisonous, or Other Gases and of Bacteriological Methods of Warfare, 1925, 26 *U.S.T.* 571; *T.I.A.S.* 8061.

30. U.N. General Assembly Resolution 2603A (XXIV) of 16 Dec. 1969.
31. Geneva Convention Relative to the Protection of Civilian Persons in Time of War, 1949, 6 U.S.T. 3516; T.I.A.S. 3365.
32. COMMENTARY ON GENEVA CONVENTION IV, (Pictet ed. 1958), at 302.
33. Geneva Convention for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field, 1949, 6 U.S.T. 3114; T.I.A.S. 3362; and Geneva Convention for the Amelioration of the Condition of Wounded, Sick, and Shipwrecked Members of Armed Forces at Sea, 1949, 6 U.S.T. 3217; T.I.A.S. 3363.
34. Convention for the Protection of Cultural Property in the Event of Armed Conflict (with Regulations and Protocol), 1954, 249 U.N.T.S. 240.
35. Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques, 1977, 31 U.S.T. 333; T.I.A.S. 9614.
36. For an analysis of the Convention and of the general issue of environmental warfare in the sense of using the forces of the environment as weapons, see ENVIRONMENTAL WARFARE: A TECHNICAL, LEGAL AND POLICY APPRAISAL, (Westing ed. 1984).
37. Protocol I Additional to the 1949 Geneva Conventions Relating to the Protection of Victims of International Armed Conflicts, with Annexes, 1977, reprinted in 16 I.L.M. 1391 (1977).
38. COMMENTARY ON THE ADDITIONAL PROTOCOLS OF 8 JUNE 1977 TO THE GENEVA CONVENTIONS OF 12 AUGUST 1949, (Sandoz *et al.*, eds, 1987) 663.
39. BOTHE, PARTSCH & SOLF, NEW RULES FOR VICTIMS OF ARMED CONFLICTS: COMMENTARY ON THE TWO 1977 PROTOCOLS ADDITIONAL TO THE GENEVA CONVENTIONS OF 1949, (1982), at 348.
40. Official Records of the Diplomatic Conference on the Reaffirmation and Development of International Humanitarian Law Applicable in Armed Conflicts, Bern, Fed. Pol. Dep., (1978), vol. VI, at 118. On U.S. attitudes to the environmental provisions, see *infra*, text at nn. 57 & 60.
41. COMMENTARY ON THE ADDITIONAL PROTOCOLS, *supra* n. 38 at 415, 417-18 and 664. The background to Articles 35 and 55 is also very usefully discussed by Kiss, in *Les Protocoles Additionnels aux Conventions de Genève de 1977 et la Protection de Biens de l'environnement*, in STUDIES AND ESSAYS IN INTERNATIONAL HUMANITARIAN LAW AND RED CROSS PRINCIPLES IN HONOUR OF JEAN PICTET, (Swinarski ed., 1984) at 181-92.
42. COMMENTARY ON THE ADDITIONAL PROTOCOLS, *supra* n. 38 at 662.
43. For a detailed and impressive critique of Article 56, see the book-length article by Parks, *Air War and the Law of War*, 32 Air Force L. Rev., 202-18. Dr. Parks is Chief of the International Law Team, International Affairs Division, Office of the Judge Advocate General of the Army. Dr. Parks is also author of the forthcoming revised U.S. Department of the Army FM 27-10, entitled *The Law of War*.
44. Parks, *Air War*, *supra*, at 212.
45. On this point, see especially Aldrich, *supra* n. 10 at 12-13. Aldrich had been the head of the U.S. delegation to the conference that adopted the 1977 Additional Protocols. The relevance of Art. 56 to the Coalition bombing in the 1991 Gulf War is explored further *infra*, text accompanying n. 113.
46. On the meaning of Art. 56, Arkin *et al.* have asserted unconvincingly: "The examples given in Protocol I, such as nuclear electrical generating stations, are not meant to be exhaustive, and a liberal construction could say that the release of the force of the oil fires and spills are covered." Arkin, Durrant, & Cherni, *On Impact: Modern Warfare and the Environment — A Case Study of the Gulf War* (a study prepared for the 3 June 1991 London Conference on the Protection of the Environment in Time of Armed Conflict), May 1991, at 140.
47. COMMENTARY ON THE ADDITIONAL PROTOCOLS, *supra* n. 38 at 668-69.
48. Additional Protocol I, *supra* n. 37, Art. 61, para. (a), items ix, xii and xiv.
49. Greenwood, *Customary Law Status of the 1977 Geneva Protocols*, in HUMANITARIAN LAW OF ARMED CONFLICT: CHALLENGES AHEAD, (Delissen & Tanja eds. 1991), at 102-03, 105, 108 & 110. See also his chapter, *Customary International Law and the First Protocol of 1977 in the Gulf Conflict*, in THE GULF WAR 1990-91 IN INTERNATIONAL AND ENGLISH LAW, (Rowe ed. 1993), at 63-88.
50. Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons which May Be Deemed to be Excessively Injurious or to Have Indiscriminate Effects, 1981, reprinted in, 19 I.L.M. 1524 (1981).
51. Charter of the International Military Tribunal, concluded in London in August 1945, Article 6(b) — extract. Full text in *The Trial of German Major War Criminals: Proceedings of the International Military Tribunal Sitting at Nuremberg Germany*, Part 22, London, HMSO, 1950, at 412-13. The section of the judgment dealing with Jodl's responsibility for destruction is at 517. See also the numerous references to scorched earth in Part 23 (the index volume), at 620.
52. United Nations War Crimes Commission, *History of the United Nations War Crimes Commission and the Development of the Laws of War*, London, HMSO for UNWCC, 1948, at 496.
53. United Nations War Crimes Commission, *Law Reports of Trials of War Criminals*, London, HMSO, vol. VIII, 1949, at 69. The Norwegian criticisms of the judgment are mentioned in Best, *WAR AND LAW SINCE 1945* (1994) at 328-30.

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54. For one approach on an important issue in the Iran-Iraq war, see Jordan, *Petroleum Transport Systems: No Longer a Legitimate Target*, 63 Nav. War Col. Rev. 47-33 (Spring 1990).

55. President Reagan's letter of transmittal of Additional Protocol II to the U.S. Senate, Treaty Doc. No. 2, 100th Cong., 1st Sess., at III (1987), reprinted in 81 A.J.I.L. 910-12.

56. On 22 January 1987 at the Sixth Annual American Red Cross-Washington College of Law Conference on International Humanitarian Law, in 2 Am. U. J. Int'l L. and Pol'y 420 & 422. For Judge Sofaer's similar remarks on consultations with allies, see 471.

For subsequent similar statements by Matheson, see A.S.I.L., *Proceedings of the 81st Annual Meeting, Boston, Massachusetts, April 8-11, 1987*, at 28 & 29.

For a subsequent authoritative account of the state of U.S.-led discussions to fill the gap left by U.S. non-ratification of Additional Protocol I, see the major critique of the Protocol by Parks, *supra* n.43 at 222-23.

57. Am. U. J. Int'l L. and Pol'y, *supra* n. 56 at 424.

58. *Loc. cit.*, 436. See also A.S.I.L., *Proceedings, supra* n. 56, at 29-31.

59. Am. U. J. Int'l L. and Pol'y, *supra* n. 56, at 427 and 434 (Matheson); and 468-9 (Sofaer). For U.S. criticisms of Article 56 see also Parks, *supra* n. 43.

60. Aldrich, *supra* n. 10, at 14. This article, a response to the critiques of the Protocol, is in some respects incomplete. Referring to Matheson's remarks in January 1987, Aldrich says simply: "With respect to the articles concerning the environment, no explanation was offered." (p. 12.) This does slightly less than justice to Matheson's remarks as cited above. Curiously, Aldrich does not refer at all to one major U.S. critique of Additional Protocol I—Parks, *Air War, supra* n. 43.

61. Greenwood, *Customary Law Status of the 1977 Geneva Protocols, supra* n. 49, at 95. See also his discussion of the agreement between Coalition States on the rules of engagement and targets in his chapter on *Customary International Law and the First Protocol of 1977 in the Gulf Conflict, supra* n. 49, at 66, 72-75, & 83-84.

62. Hague Convention No. IV Respecting the Laws and Customs of War on Land (with annexed Regulations), 1907, 36 Stat. 2227; T.S. 539; Hague Convention No. V, *supra* n. 28; Hague Convention No. VIII Relative to the Laying of Automatic Contact Mines, 1907, 36 Stat. 2332; T.S. 541; Hague Convention No. IX Concerning Bombardment by Naval Forces in Time of War, 1907, 36 Stat. 2351; T.S. 542; and Hague Convention No. XIII, *supra*, n. 28.

63. *Supra*, n. 29.

64. Geneva Convention No. I, *supra*, n. 33; Geneva Convention No. II, *supra*, n. 33, Geneva Convention III Relative to the Treatment of Prisoners of War, 1949, 6 U.S.T. 3316; 75 U.N.T.S. 135; and Geneva Convention No. IV, *supra* n. 31.

65. *Supra*, n. 34.

66. *Supra*, n. 35.

67. *Supra*, n. 3.

68. Depository information on Additional Protocol I is from ICRC, List of Signatures, Ratifications, Accessions and Successions as at 31 December 1990, 14 Jan. 1991. In the period to 30 April 1991, there was no change affecting the depository information given here: update in *Dissemination*, ICRC, July 1991, at 19.

69. *Supra*, n. 50.

70. ICRC, THE GULF 1990-1991: FROM CRISIS TO CONFLICT, ICRC Publications, 1991, at 4-5, 10-13 & 43-44. This publication summarizes the following ICRC press releases stressing the applicability of international humanitarian law in this crisis: 1640 of 2 Aug. 1990; 1657 of 14 Dec. 1990; 1658 of 17 Jan. 1991; and 1659 of 1 Feb. 1991. These public appeals were reported in newspapers at the time: see e.g. report of the previous day's ICRC press release in *The Independent*, (London), Jan. 18, 1991, at 8.

71. For full text of the ICRC *Note Verbale* and Memorandum dated 14 Dec. 1990, see 280 Int'l Rev. of the Red Cross, Jan.-Feb. 1991, at 22-6. On 11 January 1991 the U.S. Department of Defense sent a 3-page message to all commands giving the text of the ICRC Memorandum (which had been given to the U.S. Government on 10-11 December), along with some detailed critical comments clarifying U.S. interpretations of the Memorandum. Other States do not appear to have reacted so fully. Copy of U.S. message is on file with author.

72. Full text in ICRC, THE GULF 1990-1991, *supra*, n. 70 at 44; and in 280 Int'l Rev. of the Red Cross, *supra* n. 71, at 27.

73. These efforts are described in detail by Angelo Gnaedinger, the ICRC's Delegate General for the Middle East and North Africa, Department of Operations, in ICRC, THE GULF 1990-1991, *supra*, n. 70 at 10-11. See also the article therein by Girod at 12.

74. Report from Patrick Cockburn in Baghdad, *The Independent*, (London), 24 Sep. 1990, at 1.

75. *Id.*

76. Howe, *NATO and the Gulf Crisis*, 33 *Survival*, May/June 1991.

77. Reports of the Conference on the Potential Environmental Effects of a Gulf War, held in London on 2 Jan. 1991, in *The Daily Telegraph*, (London), 3 Jan. 1991, at 10; and *The Independent*, (London), 3 Jan. 1991, at 1 & 3.

78. Text of this and other statements by Mr. Wakeham are in House of Commons, Foreign Affairs Committee, Third Report, *THE MIDDLE EAST AFTER THE GULF WAR*, vol. II, 9 Jul. 1991, at 247-8. See also the Note (adopting a roughly similar line, but more detailed) by the Meteorological Office on "Possible Environmental Effects of Burning Oil Wells in Kuwait," dated 14 Jan. 1991, *ibid.*, at 249; and the Foreign Office memorandum on "Environmental and Economic Consequences of the Gulf Conflict," dated 28 Jan. 1991, *ibid.*, at 246-47.

The existence of the Note by the Meteorological Office was known at the time. In a written answer in the House of Commons on 17 January, Mr Archie Hamilton, a junior Defence Minister, said: "The Meteorological Office has produced a note for the government on the possible environmental impacts of burning oil wells of Kuwait. I am placing a copy of this note in the Library of the House." Hansard, vol. 183, col. 546, 17 January 1991.

79. Letter dated 5 Jan. 1991 from President Bush to President Hussein, as published in U.S. Department of State Dispatch, Jan. 14, 1991, at 25. (A version of the letter was also published in *The Sunday Times*, (London), Jan. 13, 1991, at 1.) James Baker said at a press conference at Geneva on 9 January immediately after his long meeting with Tariq Aziz: "He read it very slowly and very carefully, but he would not accept it nor would the Iraqi Embassy in Washington accept an Arabic courtesy translation." U.S. Department of State Dispatch, *id.*, at 22.

In "The Washington Version," Part 3, a program about the 1991 Gulf War shown on BBC television on 18 Jan. 1992, James Baker recounted that Tariq Aziz, having spent 12-15 minutes reading the letter, said that he could not accept it: "It is not written in the language heads of State use to communicate with each other." At the end of the 6-7 hours meeting, throughout which the letter had lain on the table, Aziz again refused an invitation to take it.

Later in the same program Lawrence Eagleburger, Deputy Secretary of State, said of Saddam Hussein: "One message I think he did get is that if he were to resort to chemical weapons he would regret it, and regret it intensely." Eagleburger was speaking in a general way, not referring specifically to the 9 January Geneva meeting.

In a talk with the author in Washington on 9 May 1984, James Baker indicated that the consideration which probably weighed with Saddam Hussein was the nuclear one, rather than a threat of retaliation in kind (e.g. with chemical weapons) or a threat to occupy Baghdad. He has reiterated this view, adding some detail about the warnings issued, in his book *THE POLITICS OF DIPLOMACY: REVOLUTION, WAR AND PEACE* (1995).

80. President Bush, address to the nation, broadcast from the White House at 9 p.m. EST on 16 January 1991, U.S. Department of State Dispatch Jan. 21, 1991, at 37-38.

81. Quoted in Keava, *Lawyers in the War Room*, 77 A.B.A.J. 52 (1991). The author goes on to suggest: "In the wake of the Persian Gulf War, there is little doubt that the role of lawyers in military operations has changed irrevocably." *Id.* at 59. See also the passage on "Role of Legal Advisers" in Annex O of U.S. Department of Defense, *CONDUCT OF THE PERSIAN GULF WAR: FINAL REPORT TO CONGRESS*, (1992), at 607.

82. Text published in 264 *Scientific American* 9, May 1991, at 9. A DOE spokesperson is quoted as saying that the policy was not intended to "muzzle the debate," but because discussions of the possible effects of fires and oil spills could "give the Iraqis ideas."

83. Hansard, vol. 183, col. 980, 17 Jan. 1991.

84. Report from Christopher Bellamy in Riyadh, *The Independent*, (London), Jan. 28, 1991, at 1.

85. Arkin *et al.*, *ON IMPACT*, *supra* n. 46 at 62-3 says five Iraqi tankers were involved. In 1995 Mr Arkin advised me that the number was three.

86. On 25 January 1991 Marlin Fitzwater, the White House spokesman, said the oil spill at that time taking place in the Gulf was "something that far exceeds any kind of tanker spill that we've ever witnessed." He indicated that it was several times bigger than the *Exxon Valdez* disaster in Prince William Sound, Alaska, in March 1989. This had dumped some 11 million gallons of crude [over 250,000 barrels]. The biggest oil spill disaster up to that point had been an oil rig accident in the Gulf of Mexico in 1979, which spilled 535,000 tons [over 3,750,000 barrels]; report in *The Independent*, (London), Jan. 26, 1991, at 1. (Figures in square brackets added.)

On 26 January, reporting from Riyadh on the successful U.S. bombing raid to reduce the flow of oil, Christopher Bellamy said: "But even if the flow has been stopped, between five and 10 million barrels of thick crude oil have already poured into the Gulf from Kuwait creating an environmental disaster." He also reported what were apparently official Saudi estimates that the slick was "15 times the size of that produced by the *Exxon Valdez* supertanker disaster in Alaska in March 1989"; *The Independent*, (London), Jan. 28, 1991, at 1.

On 28 January, Saudi Arabia's Oil Minister, Hisham Nazer, said that Iraq had pumped more than 11 million barrels of crude oil into the Gulf; *The Independent*, (London), Jan. 29, 1991, at 1.

87. On the weekend of 9-10 February 1991 Derek Brown, environmental co-ordinator for the Bahrain Petroleum Company, flew over the Saudi coast. He subsequently said: "There are plenty of booms in place to protect harbours and installations, and there is a big clean-up operation going on. But the whereabouts of the enormous oil slicks reported a fortnight ago are a complete mystery.... There is certainly a severe pollution problem but it does not look like an environmental catastrophe at the moment." Report, in *The Independent*, (London), Feb. 14, 1991, at 5.

88. In April 1992, the Pentagon said: "Between seven and nine million barrels of oil were set free into the Gulf by Iraqi action." — *FINAL REPORT TO CONGRESS*, *supra* n. 81 at 624. In the same month, a Greenpeace paper by William M. Arkin, *Gulf War Damage to the Natural Environment*, at 2-3, gave the same figure, but mentioned additionally that

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smaller quantities of oil continued to leak into the Gulf from a number of sources until May or early June 1991. An assessment carried out under the auspices of the Regional Organization for the Protection of the Marine Environment (ROPME) said that between 6 million and 8 million barrels of oil had been spilled in the Persian Gulf waters; summarized in YEARBOOK OF THE UNITED NATIONS 1992, at 690. See also the various figures in the publication of the Kuwait Environment Protection Council, STATE OF THE ENVIRONMENT REPORT: A CASE STUDY OF IRAQI REGIME CRIMES AGAINST THE ENVIRONMENT, Nov. 1991, at 28-30. For a very low figure (1.5 million barrels), see letter by Samir S. Radwan in 350 Nature 456 (April 1991).

89. A short survey of ecological damage is Greenpeace's THE ENVIRONMENTAL LEGACY OF THE GULF WAR, (1992). It is weak on legal issues, but has useful reports of investigations and a wide range of references. The figure of at least 30,000 marine birds perished is from the ROPME assessment (see *supra*, n. 88). See also Plant, *Legal Aspects of Marine Pollution during the Gulf War*, 7 Int'l J. Estuarine & Coastal L. 217-31 (1992).

90. The destruction of oil installations had certainly commenced by 22 January. On that day "U.S. military authorities accused Iraq of setting fire to installations at three oil fields in Kuwait. The U.S. command in Riyadh released aerial photographs which, it said, showed Iraq had blown up parts of al-Wafra oil field on Kuwait's border with Saudi Arabia." The Independent, (London), Jan. 23, 1991, at 1.

See also Counsell, *Blowing up oilfields is "easy task"*, The Independent, (London) Jan. 23, 1991, at 2.

91. Kuwait Environment Protection Council, STATE OF THE ENVIRONMENT REPORT, *supra*, n. 87 at 1, 2-3, & Table in Fig. 2. This states that after 26 February, 613 wells were on fire, 76 gushing, and 99 damaged. It quotes the Ministry of Oil in Kuwait as stating that 6 million barrels of oil per day, and 100 million cubic meters of gas a day, were being lost. THE ENVIRONMENTAL LEGACY OF THE GULF WAR, *supra* n. 89 at 17 & 38, gives figures of between 2.3 and 6 million barrels per day.

92. Letter from Permanent Mission of Kuwait at U.N. to the U.N. Secretary-General, 12 July 1991; text in ENVIRONMENTAL PROTECTION AND THE LAW OF WAR, *supra*, n. 2, at 265.

93. Confirmed by the Pentagon in U.S. Department of Defense, CONDUCT OF THE PERSIAN GULF CONFLICT: AN INTERIM REPORT TO CONGRESS, July 1991, at 13-1 & 13-2; and in the 1992 FINAL REPORT TO CONGRESS, *supra* n. 80 at 625.

94. *Id.*, INTERIM REPORT TO CONGRESS, at 13-2; see also *id.* FINAL REPORT TO CONGRESS, at 625: "As with the release of oil into the Persian Gulf, this aspect of Iraq's wanton destruction of Kuwaiti property had little effect on Coalition offensive combat operations. In fact the oil well fires had a greater adverse effect on Iraqi military forces."

95. *Id.*, at 12-6, 12-7 & *id.* 13-1.

96. Points emphasized in FINAL REPORT TO CONGRESS, *Id.*, at 625. Also, the technical specifications for every oil well in Kuwait were reportedly destroyed; McNeill, *Protection of the Environment in Times of Armed Conflict: Environmental Protection in Military Practice*, paper at the Naval War College Symposium, Newport, RI (Sept. 1995), at 80.

97. President Bush, news conference (Jan. 25, 1991), U.S. Department of State Dispatch, Feb. 4, 1991, at 68.

98. Sunday Times, (London), Jan. 27, 1991, at 24. The term "environmental terrorism" was also used by White House Press Secretary Marlin Fitzwater on 13 February; U.S. Department of State Dispatch, Feb. 18, 1991, at 114.

99. Hansard, vol. 184, col. 655, Jan. 28, 1991.

100. Hansard, vol. 186, cols. 285 & 286, Feb. 22, 1991.

101. President Bush, Statement made at the White House, Feb. 22 1991; U.S. Department of State Dispatch, Feb. 25, 1991, at 125.

102. Reports in The Independent, (London), Feb. 23, 1991, at 1.

103. See e.g. THE ENVIRONMENTAL LEGACY OF THE GULF WAR, *supra*, n. 89 at 17-22 & 34.

104. Horgan, *Up in Flames*, 264 Sci. Am. May 1991, at 7-9; Brown, *The Blazing Oilwells of Kuwait*, The World Today, June 1991, at 47; Johnson *et al.*, *Airborne Observations of the Physical and Chemical Characteristics of the Kuwait Oil Smoke Plume*, 353 Nature, 621, (Oct. 1991). The ROPME assessment, as summarized in YEARBOOK OF THE UNITED NATIONS 1992, at 690. There is, curiously, no systematic discussion of this subject in Arkin *et al.*, ON IMPACT *supra*, n. 46.

Preliminary U.N. estimates in November 1991 were that 2 billion barrels of the country's oil reserves had been lost; International Herald Tribune, (Paris), Nov. 21, 1991.

105. This is the clear conclusion of the Pentagon's INTERIM REPORT TO CONGRESS, at 12-6; and FINAL REPORT TO CONGRESS, *supra* n. 81 at 625. See also the fuller treatment, suggesting possible changes to the ENMOD Convention, in Fauteux, *The Gulf War, the ENMOD Convention and the Review Conference*, U.N.I.D.I.R. Newsletter, July 1992 at 6-12. The ENMOD Review Conference in Geneva, 14-18 September 1992, did not propose any modification of the Convention, which is likely to remain of limited practical significance; and the conference noted that no party had invoked the provisions of Article V dealing with international complaints.

106. Interim Report to Congress, *supra* n. 93, at 2-5 & 12-6.

107. Final Report to Congress, *supra* n. 81, at 625.

108. For such a proposal, see Peter Schweizer, *The Spigot Strategy*, *The New York Times*, Nov. 11, 1990. There are no tripartite treaties between the riparian States of the Tigris-Euphrates basin (Iraq, Syria and Turkey) on the allocation or exploitation of the river waters, but certain treaties on regional matters do have some implications as regards development projects on these rivers. In January-February 1990, Turkey had impounded Euphrates waters to fill the Atatürk dam, but although there appear to have been some temporary flow reductions, it does not seem to have done so during the Gulf Conflict of 1990-91. Natasha Beschoner, *Water and Instability in the Middle East*, Adelphi Paper 273, International Institute for Strategic Studies, London, Winter 1992/93, at 39-43.

109. *Report of the U.N. Secretary-General to the President of the Security Council*, Mar. 20, 1991 (U.N. Doc. S/22366). The report was by Under-Secretary-General Martti Ahtisaari.

For the view taken by Coalition forces that the entire electricity generation and distribution system was a lawful target, see Greenwood, *Customary International Law and the First Geneva Protocol of 1977 in the Gulf Conflict*, in *THE GULF WAR 1990-91*, *supra*, n. 1 at 72-4. For fuller consideration of methods, see Hampson, *Means and Methods of Warfare in the Conflict in the Gulf*, in *ibid.*, at 89-100.

110. NEEDLESS DEATHS IN THE GULF WAR: CIVILIAN CASUALTIES DURING THE AIR CAMPAIGN AND VIOLATIONS OF THE LAWS OF WAR, Middle East Watch/Human Rights Watch (1991), at 402.

111. See for example the report by Lewis, *Effects of War Begin to Fade in Iraq*, *New York Times*, May 12, 1991, at 2E.

112. Schachter, *United Nations Law in the Gulf Conflict*, 85 A. J. I. L. 466 (1991).

113. On the U.S. attitude to Article 56, and to Additional Protocol I in general, see *supra*, text at nn. 55-61.

114. House of Commons, Defence Committee, Tenth Report, PRELIMINARY LESSONS OF OPERATION GRANBY, London, HMSO, July 1991, at 10-11.

115. STATEMENT ON THE DEFENCE ESTIMATES, 1991, vol. 1, London, HMSO, July 1991, at 17.

116. INTERIM REPORT TO CONGRESS *supra* n. 93 at 12-3; and FINAL REPORT TO CONGRESS *supra* n. 81, at 611.

117. See e.g. U.N. G.A. Res. 37/215 of Dec. 20, 1982.

118. Horwitz, report from Kuwait, *The Wall Street Journal Europe*, (Brussels), Jan. 21, 1992, at 1; also Arkin *et al.*, *On Impact*, *supra* n. 46, at 132-5.

In March 1992, a British company, Royal Ordnance, said it had removed one million mines and 6000 tons of ammunition from different parts of Kuwait; *The Independent*, (London), Mar. 13, 1992.

119. On the use of depleted uranium shells, see the early reports by Cohen in *The Independent* on Sunday, (London), Nov. 10, 1991, at 1 & 2; these were based on a confidential report by the U.K. Atomic Energy Authority, written in April 1991. See also Hoskins, *With its Uranium Shells, Desert Storm May Have Sown Death*, *International Herald Tribune*, (London), Jan. 22, 1993, at 4; the author was medical coordinator of the Harvard Study Team's surveys of health in post-war Iraq. See also the discussion of depleted uranium in *supra* Chap. V, Garrett, *The Army and the Environment: Environmental Considerations During Army Operations*, *supra* Chap. X, at 2; and Arkin, *The Environmental Threat of Military Operations*.

120. Report in *The Times*, (London), Jul. 28, 1995, at 4.

121. INTERIM REPORT TO CONGRESS, *supra* n. 93 at 13-1; Robinson, 'Draft Articles, with Commentary', paper at Ottawa Conference July 1991, at 12; and Kuwait Environment Protection Council, STATE OF THE ENVIRONMENT REPORT, *supra* n. 88 at 31.

122. On the methods of coping with the oil spills in the Gulf, see the news report by Aldhous, *Big Test for Bioremediation*, 349 *Nature*, Feb. 1991, at 447 (this method was rejected by the Saudi authorities); Arkin *et al.*, *On Impact*, at 63-6; Horgan, *The Muddled Cleanup in the Persian Gulf*, 265 *Sci. Am.* 86-8 (Oct. 1991), and Holloway, *Soiled Shores*, same issue, at 81-94.

123. See, e.g., Bellamy's report from *HMS Sheffield* in the Gulf, *Gulf Wildlife Bounces Back From Disaster*, *The Independent*, (London), Jan. 22, 1992; and the discussion of 1991 Gulf War oil pollution, including the 1992 Mt. Mitchell oceanographic research expedition which studied the long-term effects of the oil spill, in John Quinn and Ronald DeMarco, *The Impact of War and Military Operations Other than War on the Marine Environment: Responsible Policy Making on the Frontiers of Knowledge*, paper at the Naval War College Symposium (Sept. 1995), Newport, RI, at 10-13.

124. Linden, *Getting Blacker Every Day*, *Time*, Atl.ed., May 27, 1991, at 68-9.

125. AP report from Kuwait City in *The Independent*, (London), Nov. 7, 1991; Garwin & Kendall, *Quenching the Wild Wells of Kuwait*, 354 *Nature*, Nov. 1991, at 11-14.

126. See e.g. the advertising section on Kuwait in *International Herald Tribune*, (Paris), Apr. 29, 1992, at 9-10; and Kielmas, *Kuwait Plunders Oilfields to Destruction*, *The Independent*, (London), May 22, 1992.

127. Horwitz, report from Kuwait, *The Wall Street Journal Europe*, (Brussels), Jan. 21, 1992.

128. Summaries of follow-up action by UNEP, ROPME and other bodies are in *UNEP Annual Report 1991*, Nairobi, 1992, at 8-9, 53 & 79; and in *YEARBOOK OF THE UNITED NATIONS 1992*, at 690-1, and *YEARBOOK OF THE UNITED NATIONS 1993*, at 820.

129. *YEARBOOK OF THE UNITED NATIONS 1993*, at 820.

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130. Hague Convention No. IV, Art. 3, *supra* n. 62, was one legal basis for the demand for compensation from Iraq, including for damage to the environment.

131. By contrast, the Security Council was silent after the war on the subject of Iraq's non-adherence to Additional Protocol I. This was for obvious reasons, including the fact that several Coalition powers were not themselves parties to the Protocol, the U.S. Government being especially critical of it: they would hardly have been in a position to impose it on Iraq, even if they had wished to do so.

132. *See* U.S. Department of State Dispatch, issues published in January-March 1991, for several statements by President Bush and others favoring the overthrow of the Iraqi regime.

133. REPORT ON IRAQI WAR CRIMES (DESERT SHIELD/DESERT STORM) (UNCLASSIFIED VERSION), prepared under the auspices of the U.S. Secretary of the Army, Washington, DC, Jan. 8, 1992, at 13, 15-18 & 46. This report was submitted to the President of the U.N. Security Council on Mar. 19 1993, and was circulated as U.N. Doc. S/25441 of that date. [Hereinafter: U.S. Report on Iraqi War Crimes.] In the 14-month interval the report had evidently been circulated to some foreign governments as one basis for possible trials, or at least the establishment of a commission of inquiry, but no action followed and it was sent to the U.N.

134. Some discussion of a possible new treaty dealing with environmental damage in war took place at the international conference held at King's College, London, on 3 June 1991. *See* Plant, *supra* n. 2.

135. Green, in his paper for the July 1991 Ottawa Conference, *supra* n. 5, at 14, suggested "the General Assembly or even the Security Council charging the International Law Commission, as a matter of urgency, to take up the issue..."

136. International Council of Environmental Law, *Law Concerning the Protection of the Environment in Times of Armed Conflict*, Munich Consultation, Dec. 13-15, 1991, Final Recommendations, at 1-2.

137. The postponement, announced on 26 November 1991, was due to disagreements on the question of Palestinian representation. The International Conference had been intended to address, as one of its two themes, respect for international humanitarian law. Among the ICRC preparatory documents containing references to the effects of war on the environment was one entitled "Implementation of International Humanitarian Law, Protection of the Civilian Population and Persons Hors de Combat" (1991), at 40.

138. Draft Resolution which was to have been item 4.2 on the provisional agenda of the Commission I, document dated Nov. 1, 1991.

139. U.N.G.A. Decision 46/417 (1991), requesting the Secretary-General to report on activities undertaken in the framework of the ICRC regarding protection of the environment in time of armed conflict. *See also* G.A. Res. 46/54 of the same date, which referred to the Draft Code of Crimes against the Peace and Security of Mankind, adopted by the International Law Commission, Art. 26 of which sought to declare criminal "an individual who wilfully causes or orders the causing of widespread, long-term and severe damage to the natural environment." 30 I.L.M. 1584 (1991), and YEARBOOK OF THE UNITED NATIONS 1991, at 823 & 848-9.

140. This paper was published as Protection of the Environment in Times of Armed Conflict: Report of the Secretary-General, U.N. Doc. A/47/328 (1992).

141. G.A. Res. 47/37 (1992), on Protection of the Environment in Times of Armed Conflict, adopted without vote. For a summary of U.N. discussions up to and including that resolution, see Morris, *Protection of the Environment in Wartime: The United Nations General Assembly Considers the Need for a New Convention*, 27 Int'l Law 775-82 (Fall 1993).

142. United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992, Rio Declaration on Environment and Development *supra* n. 12; and in Grubb *et al.*, *The Earth Summit Agreements: A Guide and Assessment*, Earthscan for Royal Inst. of Int'l Aff. (1993), at 89.

143. Protection of the Environment in Time of Armed Conflict, submitted by the U.N. Secretary-General to the 48th session of the General Assembly (U.N. Doc. A/48/269 (1993)). This 27-page document took up the main elements of, and essentially superseded, the ICRC's July 1992 report, *supra* n. 140. The new document included a 4-page appendix of "Guidelines for Military Manuals and Instructions on the Protection of the Environment in Time of Armed Conflict." These guidelines were subsequently revised in the light of comments from governments, and issued as U.N. Doc. A/49/323 (1994). The full text of this revised version appears in an appendix to Gasser, *For Better Protection of the Natural Environment in Armed Conflict: A Proposal for Action*, 89 A.J.I.L. 641-4 (1995).

144. *See* paras 11-14 of G.A. Res. 48/30 of (1993), on "United Nations Decade of International Law," adopted without vote; and para. 11 of G.A. Res. 49/50 of (1994), inviting States to disseminate widely the revised guidelines.

145. Kuwaiti woman interviewed on television program, "Dispatches," made by Jenny Barraclough and shown in the U.K. on Channel 4 on Jan. 8, 1992.

146. INTERIM REPORT TO CONGRESS, *supra* n. 93 at 13-1. The FINAL REPORT TO CONGRESS, *supra* n. 81, is silent on this issue.

147. The Coalition was reportedly prepared to resort to chemical and/or nuclear weapons, and a plan was reportedly made known to the Iraqis to deter a possible Iraqi resort to chemical weapons; Bellamy, *Allies "put Iraqis off chemical war"*, *The Independent*, (London), Nov. 29, 1991.

148. Bothe, *The Protection of the Environment in Times of Armed Conflict: Legal Rules, Uncertainty, Deficiencies and Possible Developments*, paper presented at ICRC Meeting on Protection of the Environment in Time of Armed Conflict, Geneva, (Apr. 27-29, 1992). See also the similar observation by Dieter Fleck (Director of International Affairs, Federal Ministry of Defence, Bonn), *Legal and Policy Perspectives for the Protection of the Environment in Times of Armed Conflict*, paper presented at British Institute of International and Comparative Law, London, Mar. 26, 1992, at 5-6.

149. Matheson, Deputy Legal Adviser, U.S. Department of State, in January 1987, *supra*, text accompanying n. 56. On the harmonization of rules see also Hampson's conclusion in *Means and Methods of Warfare in the Conflict in the Gulf*, *supra* n. 108, at 109-10.

150. "The U.S. concern regarding more restrictive environmental provisions is that they could be implemented only at the expense of otherwise lawful military operations—such as attacking targets which require fuel-air explosives (FAE) for their destruction." Terry, *The Environment and the Laws of War: The Impact of Desert Storm*, 65 Nav. War Col. Rev. 62 (Winter 1992).

151. On the ICRC and U.N. developments in 1992-4, see *supra* text accompanying nn. 141-44.