

CHAPTER 10 WAR AND PEACE

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The television pictures of the burning oil wells in Iraq, that we all saw at the end of the Persian Gulf War, showed dramatically the environmental destruction and pollution that can result from warfare. The first essay in this Chapter examines the actions that constitute "environmental warfare"--the direct military manipulation of the atmosphere, land, oceans, and bacteriologic systems for hostile purposes. The second essay assesses the legality of environmental warfare under the Environmental Modification Convention of 1977, reprinted in the Appendix to this Anthology. The third essay, written in 1967 (except for an introduction written recently), considers the legality of nuclear testing in the South Pacific at a time when there were hardly any treaties or international norms relating to environmental damage.

As this book goes to press (summer of 1995), the French government has announced that it will resume nuclear tests in the South Pacific region. Environmentalists throughout the world, led by Greenpeace, have reacted with outrage. The disposal of the war machine itself can cause environmental harm. The final essay in this Chapter considers the restraints that can be imposed by domestic environmental law upon the rapid dismantlement of chemical weapons as required by arms control agreements.

A. Environmental Warfare

1. Environmental Effects of War¹

The idea or practice of environmental warfare is not new. It is traceable to the origins of warfare which are hidden in the midst of human prehistory, a time when man had by direct intervention begun to rely on natural forces or resources for both offense and defense. It would appear from the literature that the earliest environmental weaponry included deeply dug trenches and forest fires. These were common in the historic and prehistoric periods in Africa, Asia, and Europe. Ancient towns were heavily fortified with circuit walls protected by deeply dug ditches. In the second millennium B.C., city defenses underwent a change; huge dump ramparts encircled cities. In 52 B.C., during the siege of Alesia, Caesar mandated the digging of a twenty foot wide and twenty foot deep ditch across the flat ground west of the Gallic town to deter sudden attacks. The Roman Empire was also notorious for incendiary practices in warfare--the systematic burning of crops, animals, buildings, etc. Just before the end of the last century, during the Second Anglo-Boer War of 1899-1902, the Boers set fire to wide areas of the Veldt to deprive the horses of the advancing British troops of necessary forage. The only way in which these early strategies differ from subsequent modalities of fiddling with nature, is that modern man, in keeping with technological and scientific advancement, has introduced new dimensions to the techniques of environmental warfare.

Central to this discussion is the validity of distinguishing environmental warfare from conventional warfare, and to draw a sharp boundary between the "permissible" and "impermissible" acts in warfare from the angle of environmental concerns within the international regime. Environmental warfare shares a number of paradigms with "warfare" per se, perhaps the most significant being, like conventional warfare, environmental warfare is a manifestation of human nature and its propensity to violence or destruction. The fundamental distinction, however, emerges from the definition of environmental warfare.

a. Environmental Warfare Defined

Environmental warfare alters the environment with the use of any conceivable instrument, such as conventional weapons, unconventional weapons, natural forces or resources, usually during a war, to attain a military or hostile purpose. It is a practical example of an unconventional warfare.

The environment is described as "all the conditions, circumstances, and influences surrounding and affecting the development of an organism or group of organisms." Human life and other living organisms (animals, plants, etc.) are dependent on the wholesomeness of the environment and are influenced by the weather and climate of the environment. To a large extent, the weather and climate are dependent upon the character of the earth's surface (the lithosphere, hydrosphere, and biosphere), as well as the atmosphere and space. Any destructive manipulation of these environmental constituents, given the motive and circumstance, may well be tantamount to an environmental warfare.

Oil pollution of the seas is not a novelty, but the 1991 Persian Gulf War oil dump lends itself to the characterization of environmental warfare. In contrast to the earlier environmentally disastrous "Torrey Canyon" or "Exxon Valdez" oil spills, the Persian Gulf oil spill was employed as a military weapon/tactic, with military objectives in an international military crisis. Although the military advantages resulting therefrom to the perpetrator may not be readily admitted by the opponents, one truth remains patently clear: the enormous ecological catastrophe consequent upon this particular environmental manipulation.

An attempt has been made under the law to define environmental warfare. Article 1 of the Convention on the Prohibition of Military or any Other Hostile Use of Environmental Modification Techniques (or ENMOD Convention) 1977, prohibits military or any other hostile use of "environmental modification techniques." Article II states that the term "environmental modification techniques" refers to any techniques 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.

(1) Atmospheric Manipulation

Direct military manipulation of atmospheric constituents for hostile purpose has, in recorded instances, been attempted and accomplished with or without significant military success. Some of the notable manipulations of the atmosphere for military objectives are: rainfall enhancement, climate modifications by incendiary means, release of materials to alter the electrical properties of the atmosphere, and injection of electromagnetic fields in the atmosphere.

Scientific manipulation of the atmosphere to stimulate rainfall probably began in the mid-1940s. This entails the seeding of clouds, given the right temperature, with artificial ice-initiating substances such as silver iodide, lead iodide, or copper sulphide to form crystals; or with coarse hygroscopic (water-absorbing) nuclei to form large droplets. Torrential rainfall, accompanied by lightning, etc., if indeed this can be scientifically generated for military objectives, will no doubt severely hamper military air and ground manoeuvres of the attacked forces. However, there is yet no proof that man can scientifically manipulate the clouds to generate such powerful lightning, hurricanes, and thunderstorms to achieve any significant military advantage, to the detriment of the enemy in warfare. The attempt to stimulate rainfall by the U.S. military during the Second Indochina War in order to render the enemy's advance route impassable was not successful. One reason given is that the clouds were not the right sort. To be amenable to rainfall enhancement, scientists claim that the temperature of the cloud must be colder than - 10 degrees C.

Another kind of atmospheric manipulation was also attempted by the U.S. military in the course of the same Second Indochina War. Unknown substances were injected into the lower atmosphere over the enemy's territory possibly to disable enemy radars used for aiming defensive surface-to-air missiles.

The most probable and destructive manipulation of the atmosphere to date remains to be incendiary attacks by conventional or nuclear means. Wildfires generated by torching forests, grasslands, industrial facilities, etc., would emit huge amounts of smoke and other aerosols into the atmosphere. Gases such as sulphur dioxide emitted into the atmosphere by the burning of sulphur-containing fossil fuel can enhance acid rain with transboundary effects, which is a current global environmental problem. It has been suggested that a large scale nuclear war would similarly initiate horrendous fires on a huge scale sufficiently to have a dramatic hemispheric impact and deleterious consequence for the weather for a period of weeks or months. The results would be quite disruptive to the human environment. It is suggested by scientists that the impact of nuclear war on the atmosphere, often referred to as "nuclear winter," would seriously affect an area possibly as large as half of the globe for a period of weeks or months.

The Persian Gulf War oil torch has shown that the world need not await anything as awesome as a nuclear attack to see a similar dramatic impact on the atmosphere. There are reports that the Kuwaiti oil well fires blotted out the sun and made breathing almost impossible. The sun was so heavily obscured by the smoke that motorists had to use headlights at noon and temperatures reportedly slipped down ten degrees lower than normal, "chilling what is usually a gentle spring, and causing respiratory diseases among the elderly and young."

Other conceivable techniques for manipulation of the atmosphere for hostile purposes include: disruption of the ionized or ozone layer, generating and directing storms through control of winds, and hailstone production--all of which are still within a trivial level of contemplation. However, there has been some recorded success with the dissipation of super-cooled fog, for example, over airports, by seeding them with artificial nuclei, though not necessarily restricted to military objectives.

(2) Manipulation of Land/Water Systems

Possible manipulations of land and its water systems for military or hostile purposes will include: triggering earthquakes, tsunamis (seismic sea waves), landslides, quiescent volcanos or lakes; destruction of water containments, nuclear plants, oil wells, etc.; and torching land, forest, vegetation, etc. Most of these phenomena are capable of releasing vast amounts of potential energy with powerful forces and destructive consequence for man and his environment. Some of these have been actually used in the surprise attack arsenal of military forces, while others still remain within the realm of scientific conjectures and military fantasy.

The question has been raised whether earthquakes can be triggered in enemy territory. It has been suggested that this is possible through the action of a nuclear explosion detonated at a depth of 5 kilometers or more, releasing a sticking point, which would cause significant earth tremors. An underwater nuclear explosion at the Continental

Shelf might also generate a tsunami.

In a closely related manner, it is quite possible to trigger quiescent volcanoes or lakes for hostile purposes with a nuclear bomb of one-ten kilotons, penetrating a depth of about one hundred meters to spark explosive eruptions of lava or gases as well as a violent injection of dust into the atmosphere. In one spectacular instance, late in the night of August 21, 1986, Lake Nyos, in Northern Cameroun, erupted, boiled at very high temperatures, overflowed its banks, and emitted poisonous gases. It took a disastrous toll on human, animal, and plant life in all the villages through which the "wind of death" swept. The deadly gases which included carbon dioxide, carbon monoxide, and hydrogen sulphide, or cyanide gas, killed over eighteen hundred people and almost all the animals in these villages were decimated. Crops were also destroyed. Although the incident was "officially" ascribed to the natural eruption of toxic gases from Lake Nyos, there is a suggestion in certain quarters that the incident might be connected with nighttime covert military testing of some unconventional military weapons, an act which the United Nations has sought to discourage and urged nations to refrain from doing. It has not been possible to confirm this suggestion.

American, Israeli, and French teams of geologists who carried out an on-the-spot survey of the disaster did not rule out the possibility of Lake Nyos erupting again. The first such disaster occurred in 1984, when Lake Manoum, also in Northern Cameroun, erupted, emitting cyanide gas which killed thirty-seven people. In the northwest region of Cameroun, there are twenty such volcanic lakes capable of emitting these toxic gases. The environmental damage consequent upon such disasters is always enormous, as demonstrated by the Lake Nyos incident. The "Dead Land" is a perfect allegory to describe the affected areas in the aftermath of this incident. The once fertile lands in the Camerounian villages of Sobum, Chah, Koshing, and Nyos lay barren and defoliated, with charred remains of burnt crops and carcasses of rotting animals. Survivors of the disaster who were evacuated complained of heartburn, eye lesions, and neurological problems such as monoplegia, a condition that affects one muscle or group of muscles, one limb or one part of the body, and paraplegia, paralysis of the lower part of the body and limbs.

Overt or covert military operations will continue to take advantage of such potentially unstable terrain represented by quiescent volcanoes or lakes. According to scientists, a surface or subsurface burst of a nuclear bomb, perhaps one hundred kilotons, would generate vibrations that would result in considerable regional damage to the environment. Worldwide, it is estimated that there are perhaps 750 volcanoes classified as being active. They are quiescent most of the time but erupt occasionally at unpredictable times. These are located mostly in the Pacific Ocean basin, the Mediterranean region, and the Mid-Atlantic ridge in Antarctica. They pose a threat to the human environment, particularly because some of these have the potential to alter the weather and climate on a hemispheric and possibly a global scale. Scientists have confirmed that whether or not an eruption is imminent can now be recognized (i.e. monitored) in advance by remote seismic instruments. The chances are therefore high that military commanders either covertly or overtly could seize advantage of that brief period when a quiescent volcano or lake would be vulnerable to triggering for hostile manipulation.

One of the most recurrent surprise attacks involving environmental manipulation in the history of warfare has been the destruction of water systems to initiate destructive flooding. As far back as June 1672, during the Franco-Dutch War of 1672-78, the Dutch were able to intercept the French army by damaging dikes leading to the release of water which was dubbed the Holland Water Line--a factor which to some extent prevented the French army from gaining control of the Netherlands in that war.

A far more devastating example of deliberate military flooding emerged in the Second Sino-Japanese War of 1937-45. In June 1938, the Chinese dynamited the Huayuanow dike of the Yellow River (Huang He) near Chengchow to stop the advancing Japanese troops. This military objective was largely achieved as several thousand Japanese soldiers drowned and could not advance into China. On the other hand, however, the massive flooding resulted in the ravaging of 11 Chinese cities and more than 4,000 Chinese villages, with millions of hectares of farmland washed away, crops and top soil destroyed. At least several hundred thousand Chinese were drowned while several millions were left homeless, thus making this particular environmental warfare "the most devastating single act in all human history in terms of numbers of lives claimed."

World War II also provides two examples of intentional military flooding. In the first recorded incident, in May 1943, the British troops destroyed two major dams in the Ruhr Valley, the Mohne and Eder, resulting in vast damage. The result pleased British Air Force which summarized the results as "maximum effect with minimum effort." Factories, power stations, coal mines, and railway lines were destroyed by the flooding, about sixty-five hundred cattle and pigs were lost and three thousand hectares of arable land was ruined. According to official German figures, some 1,294 people died in the incident. In the second incident of intentional military flooding during World War II, in 1944, German forces flooded some 200,000 hectares of agricultural lands in the Netherlands with saltwater.

During the Korean War, the U.S. Army attacked dams in North Korea, an action which the Americans

admitted was one of the most successful in their air operations in the course of the Korean War.

As dams, dikes, levees, and rivers offer potential environmental targets for deliberate military striking in warfare, so do industrial and power generating plants which contain potential dangerous and toxic substances. Currently in the world, there are hundreds (quite a conservative estimate) of nuclear-powered electrical generating stations, spent fuel reprocessing plants, nuclear bomb facilities, and land based facilities harboring large quantities of radioactive materials, crude oil wells and oil refinery stations. If any of these facilities are bombed, detonated, or torched deliberately or otherwise in warfare, the extent of the considerable environmental disaster which would ensue is unpredictable. Incidentally, the Iraqi nuclear station had not begun operation when it was attacked by the Israelis with hostile intent. If the nuclear station had been already in active use, the Israeli attack on the facility would have resulted in the contamination of a considerable area with injurious levels of Strontium-90, Caesium-137, and other radioactive elements. It would be impossible to decontaminate such areas which would remain uninhabitable for decades.

The Persian Gulf War provides a vivid example of intentional military oil flooding and oil torching. The massive environmental destruction resulting from this disaster has been detailed earlier in this discussion. Perhaps one point which this incident reaffirms is the "maximum effect with minimum effort" assertion. It does not necessarily require the application of enormous energy to activate the destructive forces enclosed by some of the potentially dangerous facilities. All that was required in the Persian Gulf War was to turn on the Kuwaiti oil spigots, probably with a switch of the hand--then hell let loose and vast environmental disaster followed.

Incendiary surprise attacks are another common deliberate technique of environment manipulation in warfare. During the Second Anglo-Boer War of 1899-1902, the Boers set fire to wide areas of the Veldt in order to deprive the advancing British troops of the forage required for their horses. On the other hand, the environmental impact was severe. The affected lands could not yield food for that growing season and the local wildlife was gravely afflicted and deprived of essential sources of food. Fires of this sort would no doubt cause extensive damage to the forest ecosystem, its wildlife, and its nutrient budget. It could lead to deforestation. Any substantial recovery from such unbalancing of the forest ecosystem may take decades.

(3) Manipulation of the Oceans

The deliberate military mining of the ocean floor with explosives in order to destroy or inflict damage upon the enemy's naval vessels, equipments, etc., in warfare, is quite common. There were reports of such military mining of the oceans in the Persian Gulf War. Other techniques which could be employed, with hostile intent to manipulate the oceans include: change of the physical, chemical, and electrical parameters of the seas and oceans; triggering tsunamis (large tidal waves); destruction of oil wells on the continental shelf; and destruction of nuclear powered ships, oil tankers, or other vessels containing toxic cargo on the seas or oceans. The release of radioactive or other toxic substances into the seas or oceans will engender serious environmental catastrophe for the hydrospheric ecosystem, marine life, and also with possible severe implications for regional or global climatic patterns. Human exploitation of the natural resources of the seas or oceans affected thereby, may be eroded for several years.

Physical and chemical manipulations of the seas or oceans can possibly disrupt acoustic (sonar) or electromagnetic properties of the attacked waters. The purpose of such an attack might include the disruption of the enemy's underwater communication, remote sensing, navigation, and missile-guidance system.

The triggering of tsunamis or sea waves along very sensitive coastlines by nuclear bomb attack is probably not a farfetched environmental warfare technique for the purpose of destroying coastal cities and other near shore facilities. There is, however, no evidence that this has actually been attempted in warfare.

(4) Chemical and Bacteriological (Biological) Manipulation

Chemical and bacteriological (biological) weapons remain high on the list of weapons in national armaments which pose the greatest threat to man, animals, plants, and their natural environment. Thus, on August 12, 1948, the Security Council adopted a resolution which said in part that "weapons of mass destruction should be defined to include . . . lethal chemical and biological weapons." Notwithstanding, chemical and bacteriological weapons are still surprise weapons for hostile attack in the arsenal of a number of countries in the world today, despite the fact that this use and in some instances the development and stockpiling of these weapons have been forbidden in principle or solemnly by the body of civilized nations.

Chemical weapons were widely used in the First World War. Choking agents, for instance, were introduced in the First World War. According to the official records, blister agents caused more casualties than any other chemical agent used in World War I. Gas casualties on the whole numbered about 1,300,000 of which about 100,000 were fatal. Biological weapon attacks are also not new to warfare. For centuries, spreading disease throughout the enemy's army was considered a practical tactic. Advances in modern science and technology have simply increased the potency of both biological and chemical weapons, rendering them more lethal and capable of completely

destroying human beings and the means of their existence within a short period of time.

According to scientists, the use of certain biological warfare agents could introduce exotic microorganisms into an area on a long term or permanent basis. These microorganisms would be capable of unbalancing or adversely re-balancing the regional ecosystem to such an extent that the area would be uninhabitable for an indefinite period of time. For example, the United Kingdom used the Scottish island of Gruinard for testing the military potential of *Bacillus anthracis*, the causative agent of anthrax, between 1941-1942. That act left the island dangerously contaminated even today.

In February 1952 the USSR brought charges before the Disarmament Commission accusing the United States forces of using bacterial weapons in China and Korea, charges which were denied by the United States and the countries supplying forces to the United Nations Command in Korea.

During the 1935-36 Italian-Ethiopian War, Italy deliberately and with hostile intent used mustard gas on the Ethiopian patriotic fighters and unarmed civilians, destroying villages and killing thousands of people.

In 1966, the U.S. was accused of chemical weapon attack in Vietnam, a charge which it denied, apparently on technical grounds. The U.S. maintained that the Geneva Protocol of June 17, 1925, did not apply to all gases and did not prohibit the use of tear gas, a chemical agent that governments around the world commonly use as a riot-control agent. At the time of the accusation, the U.S. was not party to the Geneva Protocol, 1925.

A more recent devastating example of intentional military chemical weapon attack was during the eight year Iran-Iraq War. In 1984, the Islamic Republic of Iran had alleged that chemical weapons were used by Iraq, an allegation which was confirmed by a team of United Nations fact-finding experts.

Chemical agents have been described and characterized by the United Nations in terms of their physiological effects as follows: (a) Nerve Agents: colorless, odorless, tasteless chemicals of the same family as organophosphorus insecticides. They poison the nervous system and disrupt vital body functions. They constitute the most modern war chemicals known; they kill quickly and are more potent than any other chemical agents (except toxins). (b) Blister Agents: oily liquids which mainly burn and blister the skin within hours after exposure. They also have general toxic effects. (c) Choking Agents: highly volatile liquids, which when breathed as gases, irritate and severely injure the lungs, causing death from choking. (d) Blood Agents: also enters the body through the respiratory tract. They produce death by interfering with the utilization of oxygen by the tissues. They are much less toxic than nerve agents. (e) Tear and Harassing Gases: sensory irritants which cause a temporary flow of tears, irritation of the skin and respiratory tract and, occasionally, nausea and vomiting. They have been widely used as riot-control agents and also in war. (f) Psycho-Chemicals: drug-like chemicals which cause temporary mental disturbances. (g) Herbicides: agricultural chemicals which poison or desiccate the leaves of plants, causing them to lose their leaves or die. Some herbicides, particularly those containing organic arsenic, are also toxic for man and animals.

The gravity or depth of destruction which a chemical or bacteriological (biological) attack can generate for man and his environment is best summed up in this extract from the report of the Consultant Experts appointed by the Secretary-General in 1968 to study the effects of the possible use of chemical and bacteriological means of warfare:

All weapons of war are destructive on human life, but chemical and bacteriological (biological) weapons stand in a class of their own as armaments which exercise their effects solely on living matter. . . . The fact that certain chemical and bacteriological (biological) agents are potentially unconfined in their effects, both in space and time, and that their large scale use could conceivably have deleterious and irreversible effects on the balance of nature adds to the sense of insecurity and tension which this class of weapons engenders.

The general conclusion of the report can thus be summed up in a few lines. Were these weapons ever to be used on a large-scale in war, no one could predict how enduring the effects would be and how they would affect the structure of society and the environment in which we live. This overriding danger would apply as much to the country which initiated the use of these weapons as to the one which had been attacked, regardless of what protective measures it might have taken in parallel with its development of an offensive capability.

Thus, it would seem that the only consideration, in fact, capable of preventing the application of these weapons for hostile purpose in warfare, is the equal risk to which those who apply these weapons would be exposed. It will be recollected that this is one of the possible explanations offered as to why Iraq failed to use this "much expected" method of surprise attack on the Allied troops, Saudi Arabia, or Israel during the Persian Gulf War.

Until very recently, national and global environmental protection focus has been largely preoccupied with relatively modest environmental threats while neglecting big ones such as environmental modification techniques that could unleash massive catastrophe. In fact, scientists who cared to postulate different kinds of possible environmental warfare scenarios have been branded as "alarmists" or "dreamers." The fact remains that

consequences of environmental threats such as air pollution, water pollution, oil spills, hazardous wastes, release of radioactive materials, for example, which weigh more on national concern, are relatively limited or short-lived and usually reversible, while consequences of environmental threats such as global warming, destruction and alteration of natural habitats resulting from an act of environmental warfare, appear to be more damaging in the long run and their effects more widespread and difficult to reverse. Unfortunately, the third world countries which still lag far behind the industrial nations in terms of environmental protection awareness at the national level, are the arenas for, as well as victims of, most of the environmental warfare attacks in modern history. Thus the developing countries, just as developed ones, must readjust their priorities if man must be saved from self-destruction and annihilation of the earth out of sheer folly in unguarded moments of warfare. Such folly was demonstrated by the recent environmental warfare attack in the Persian Gulf War, where the resources of national/regional development and the means of subsistence for man were deliberately destroyed to the detriment of peoples or nations yet struggling to attain sustainable development.

2. Legal Appraisal²

The recent attention devoted to the long-term effects of nuclear war, the cumulative impact of which has become popularly described as the "nuclear winter," has for the first time dramatized to the public the distinct menace of environmental disruption resulting from military activities. Thomas speculates about the overall circumstance of survival in a post-attack setting: "In such an event, the question of the survival of human beings becomes almost a trivial one. To be sure, some might get through, even live on, but under conditions infinitely more hostile to humans than those that existed one or two million years ago when our species first made its appearance." Given the magnitude and possibly irreversible character of the disruption resulting from any extensive use of nuclear weapons, it becomes absurd to view and dismiss such environmental disruption as incidental.

Despite acknowledgement of this menace, to turn to international law for relief provides only the most scant basis for hope at present. As has been observed in relation to the Environmental Modification (Enmod) Convention of 1977, seemingly only those techniques of environmental modification beyond the scope of "rational" war making have been forbidden. What is militarily attractive remains permissible, or at least not explicitly prohibited, whereas that which is of no evident relevance to war making is diligently proscribed. Incredibly, not even the chain of deliberate military activities associated with inducing a "nuclear winter" is outlawed by the Enmod Convention because, presumably, the direct intention of nuclear attack would be the destruction of enemy capabilities, not the induced chain of environmental "side-effects" which cumulatively produce the period of adverse weather conditions.

In a sense, the entire law of war exists uneasily within this problematic setting. Representatives of states are unwilling to agree upon explicit prohibitions that encroach upon their freedom of action in wartime. As a result, especially those governments that have relied upon tactics of environmental disruption in the past are reluctant to acknowledge the dubious character of their earlier policies and to constrain their choice of military options in the future. At the same time, the force of public opinion creates pressure to do something that acknowledges growing concerns about the character and consequence of war. Hence, there is a steady stream of agreements and conferences bearing on the development of law governing the various aspects of armed conflict. The point here is not to deny the validity of such undertakings, but to take note of their inability to overcome an absence of political will by governments to oppose war making, even at the self-destructive upper limits of nuclear war making.

Often the official justification for this resistance to law making has to do with the insufficiency of verification and enforcement techniques. In effect, since the "other" side cannot be trusted it is necessary to possess offsetting capabilities. This kind of reasoning underlies the rationale for the policy of nuclear deterrence, as well as for the accompanying nuclear arms race.

Closely linked to this argument is the contention that the relative humaneness of tactical choices cannot be helpfully laid down in advance. The claim, for instance, that the use of atomic bombs in 1945 against Japanese cities "saved lives" and ended World War II more rapidly is a prominent example of such reasoning, although its specific factual premises have been increasingly challenged by recent scholarship. More pertinently, perhaps, military planners in the US are resistant to prohibitions on "useful" military options that involve deliberate environmental destruction of the sorts resorted to in the Second Indochina War. This concept of legitimate military necessity is a particularly powerful obstacle to law making where, as here, there exists no logic of reciprocity to make adoption of restraints seem worthwhile to powerful, high-technology states. In counter-insurgency warfare, the natural environment provides cover and protection to the insurgent side, but it impedes the efforts of the counter-insurgent side to "cleanse" the countryside.

The general record of compliance with international law in major wars has not been encouraging. The dictates

of military necessity, as assessed by opposed leaderships, have taken consistent precedence over the laws of war in almost every critical aspect of belligerent policy. Thus, in World War II unrestricted air and submarine warfare overcame earlier explicit rules on neutral rights and duties embodied in the 1907 Hague Conventions V and XIII, as well as even more fundamental prohibitions upon waging war directly against civilian targets. Indeed, the concept of "total war," evolving through the two world wars, supported without serious qualms the deliberate destruction of entire cities from the air and raised questions about whether it was at all possible to regulate the conduct of war in meaningful respects. Tendencies towards unconditional warfare with increasingly destructive and indiscriminate weaponry and doctrine were growing on all sides. These negative observations should be qualified in certain ways. To some extent, the relevance of the rules of law to warfare were rehabilitated and reaffirmed by the Nuremberg judgments of the United Nations War Crimes Commission (UNWCC) and by subsequent negotiations designed to modernize and extend the law of armed conflict. Additionally, some of the latest innovations in weapon technology, both at nuclear and conventional levels, emphasize accuracy, facilitating discrimination among targets; partly in response to earlier criticism, these innovations are accompanied by new military doctrines calling for such discrimination. These developments are troublesome in other respects, seemingly lending some level of legitimacy (moral, legal, cultural) to reliance by the state upon a nuclear option.

The standard obstacles to effective law making noted above are made even more impassable by some special features of the current international setting. Overall, this is not a favorable time to initiate additional law-making initiatives. There is a keen skepticism about adherence to existing explicit prohibitions, for instance, with respect to chemical weaponry. There have been significant recent accusations directed at both the USSR and Viet Nam, and at Iraq (in the current Iraq-Iran War), of illegal use of chemical weapons of various kinds, a context within which the legal prohibition is regarded as firm.

Also relevant is the realization that creating rules and procedures does not by itself ensure their serious utilization. After years of effort, an agreed definition of aggression under the United Nations Charter was finally achieved in 1974, but its impact on subsequent state practice has been virtually nil. Finding ways of making existing legal arrangements more effective and creating new legal arrangements are part of the challenge. In the environmental context, however, it is true that the norms directly available, with the partial exception of the Enmod Convention, are very general; more detailed prescriptions would be useful, as would the process of their negotiation.

Indirect norms, by way of general international law of war, provide an existing framework that, if energetically interpreted and implemented, would protect the environment against military activities. These general, indirect rules and procedures, although suggestive of the direction of further development, derive from general principles that are not treated by governments as inhibiting or guiding their specific actions very significantly. At the same time, their existence does provide some criteria by which to appraise the legality of controversial policies harmful to the environment. Such a general framework is no substitute for invigorating the treaty process for environmental subject matter. Part of the challenge of making international law effective is to make governments and political leaders feel as if they have given their consent in a formal and active process of negotiation and accession (signature and ratification).

a. Emergent International Law

International law did not regard environmental protection as a distinct goal of the law of war until the upsurge of specific environmental concerns in the 1970s. Military activities were not perceived as posing any special threat to environmental quality, although, in fact, various tactics of scorched earth and crop destruction throughout the history of warfare did serious local environmental harm, and there were occasional expressions of concern all along about injuries done to animals or prized environmental surroundings.

To be sure, safeguarding belligerent property interests unwittingly included an element of environmental protection. Thus the 1907 Hague Convention IV Respecting the Laws and Customs of War on Land states in Article 55 that:

The occupying State shall be regarded only as administrator and usufructuary of public buildings, real estate, forests, and agricultural estates belong 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.

This principle is carried forward in somewhat more straightforward property terms in the 1949 Geneva Convention IV Relative to the Protection of Civilian Persons in Time of War, stating in Article 53 that:

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

It is difficult to assess whether such guidelines were operative in constraining belligerent occupation, but, as stressed, the protection of the environment as such was incidental to the purpose of legal rules. The neglect of the

environment as a distinct concern was consistent with the overall view of Western civilization that nature existed solely for the glory of humankind. International law, in its formative period, reflected this anti-nature bias of our civilization.

Flagrant disregard of these restraints was the basis for charges of war crimes against 10 German civilian administrators of Polish forests during a period of belligerent occupation (1939-44) in the course of World War II. Nine of these Germans were accused of war crimes by the United Nations War Crimes Commission at Nuremberg (its case no. 7150) because of their implementation of a Nazi policy "of ruthless exploitation of Polish forestry," which was treated as "pillaging," and involved "the wholesale cutting of Polish timber to an extent far in excess of what was necessary to preserve the timber resources of the country." In this passage there is recognized a legal right pertaining to sustaining the resource base, at least in the context of occupation. Note that Article 53 of the 1949 Geneva Convention IV (quoted above) permits a belligerent to destroy property to the extent "rendered absolutely necessary by military operations." Once such a criterion is introduced it confines the legal prohibition to wanton or superfluous destruction. Such judgments of necessity are difficult to second-guess; hence, the regulatory effects are likely to be modest. Only in retrospect, and then by victors in relation to the deeds of losers in a war, would wanton destruction of natural surroundings or resources seem to create a basis for legal accountability. By then, the damage would have been done. In the next war, the nature of the modern state reaffirms its claims of unconditional national security interests, leading to the primacy of military necessity and the disregard of environmentally disruptive effects. More substantial restraint might result, however, if the necessity exception were to be more self-consciously restricted to lawful military operations by leaders and planners.

There was remarkably little concern about environmental destruction per se until the Second Indochina War. Efforts to place the issue of military activities on the agenda of the United Nations Conference on the Human Environment, held in Stockholm in 1972, were not successful, largely because of US objections arising from its sensitivity to criticism directed at its then current practices of environmental destruction during the Second Indochina War. An informal counter-conference was held in Stockholm at the same time as the official conference in order to highlight the importance of this political oversight, and to consider the environmental harm associated with counter-insurgency war and its legal status. The prime minister of Sweden did usefully call public attention to the problem of environmental destruction in Indochina, and also within the context of testing and uses of nuclear weaponry.

Nevertheless, the Conference Declaration in its "Proclamation" section avoided associating serious environmental dangers explicitly with military activities. However, in its "Principles" section there is a direct acknowledgment of environmental threats posed by nuclear and other weapons of mass destruction. Principle 26 of the Declaration reads:

Man and his environment must be spared the effects of nuclear weapons and all other means of mass destruction. States must strive to reach prompt agreement, in the relevant international organs, on the elimination and complete destruction of such weapons.

Principle 21 of the Declaration seeks to reconcile sovereign rights with environmental protection:

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

Such a principle may embody customary international law and therefore express a legal obligation that does, in theory, apply to military activities with transnational effects, especially those whose harmful environmental effects are not confined to belligerent countries. Subsequent United Nations General Assembly resolutions recognized the need for more explicitness. A resolution on the "Effects of atomic radiation" deplored the polluting effects being caused by the continued atmospheric testing of nuclear weapons. Another, on the "Prohibition of action to influence the environment" considered "it necessary to adopt, through the conclusion of an appropriate international convention, effective measures to prohibit action to influence the environment and climate for military and other hostile purposes, which are incompatible with the maintenance of international security, human well-being and health."

These background sentiments more forcefully animate the 1982 World Charter for Nature adopted by the United Nations General Assembly by a vote of 118 in favor and 1 against (with 18 abstentions). In its first operative section, devoted to "General principles," Paragraph 5 is pertinent: "Nature shall be secured against degradation caused by warfare or other hostile activities." In a separate section of "Functions," Paragraph 11 seems relevant:

Activities which might have an impact on nature shall be controlled, and the best available technologies that minimize significant risks to nature or other adverse effects shall be used; in particular:

(a) Activities which are likely to cause irreversible damage to nature shall be avoided;

(b) Activities which are likely to pose a significant risk to nature shall be preceded by an exhaustive examination; their proponents shall demonstrate that expected benefits outweigh potential damage to nature, and where potential adverse effects are not fully understood, the activities should not proceed.

These formulations, given assent by representatives of governments after careful drafting, discussion and reflection, are certainly indicative of an emerging consensus that would seem to forbid reliance on all forms of direct and indirect assaults on the environment in the course of a war effort. Yet there is no political capacity to make such implications explicit. It is also noteworthy that the one negative vote cast against the World Charter for Nature was by the US, the state that has relied on large-scale, systematic environmental warfare in a recent conflict. Several states, indeed all of the nuclear powers, insist on retaining options relating to testing, threats and uses of nuclear weaponry, although several, including China and the USSR, have formally renounced first-use options. Hence, the direction of international normative thought is clear, but it lacks authoritativeness in that the most evident policy implications are avoided; and the perhaps most significant state relative to normative developments refuses to endorse even these abstract formulations of the principles at stake.

The 1977 Protocol I Additional to the 1949 Geneva Conventions is also relevant to these assessments. This Protocol carried forward the earlier general directives on environmental protection against military activities. It elaborates on some of the general thinking embodied in the 1899 and 1907 Hague Conventions and in Article 35 sets forth the following standards of law:

1. In any armed conflict, the right of the Parties to the conflict to choose methods or 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.

On the face of it, Article 35.3 would seem to prohibit weapons of mass destruction, yet this is far from assured. The legal reach of the formulations is restricted, or at least ambiguous, because the US delegate to the negotiations had insisted that this Protocol not be understood as intending to have any bearing on the legal status of nuclear weapons. In question here is whether the formulation in Article 35.3 is merely expressive of international customary law, and thus cannot be restricted in its scope by the unilateral declaration of any government. Article 36, dealing with new weapons, is also relevant inasmuch as it implies that a new weapon may be illegal even if not subject to an explicit prohibition either by "this Protocol or by any other rule of international law." At the same time experts on international law mainly agree that the legality of new weapons and tactics cannot be presumed, but depends on establishing compatibility with pre-existing general principles of the law of war.

The 1977 Geneva Protocol I expresses a rule in its Article 55 that seems to incorporate the minimum current consensus of international law on military activities in relation to the natural environment:

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

2. Attacks against the natural environment by way of reprisal are prohibited.

Note here that this formulation does not clearly prohibit the type of tactics relied upon by the US in the Second Indochina War, which could arguably fall below the damage threshold of "widespread, long-term and severe." However, it might well be that an impartial tribunal, if convened to assess environmental harm in Indochina, would find US practices incompatible with the standards of Article 55. In the so-called Understanding relating to article I of the 1977 Enmod Convention the terms "widespread," "long-lasting," and "severe" were interpreted as follows by the Conference of the Committee on Disarmament (CCD):

(a) "widespread": encompassing an area on the scale of several hundred square kilometers;

(b) "long-lasting": lasting for a period of months, or approximately a season;

(c) "severe": involving serious or significant disruption or harm to human life, natural and economic resources, or other assets.

The CCD stressed that this interpretation was "intended exclusively for this Convention and is not intended to prejudice the interpretation of the same or similar terms if used in connection with any other international agreement."

One must note that these three criteria, as used in the 1977 Geneva Protocol I, are not subject to any exemption by way of military necessity, nor is the prohibition directed, as in the Enmod Convention, only at tactics

that have as their object environmental destruction. At the same time, the word "and" rather than "or," as in the Enmod Convention, suggests that all three features of environmental harm must be present for the prohibition to be applicable. It would appear, by virtue of the textual language, that most contemplated uses of weaponry of mass destruction fall within the ban.

The general prohibition of Article 55 of the 1977 Geneva Protocol I is made more specific in Article 56 where "dams, dikes and nuclear electrical generating stations" are legally protected from attack "even where these objects are military objectives." In fact, Article 56.1 even forbids attacks upon "military objectives located at or in the vicinity of these works or installations . . . if such attack may cause the release of dangerous forces." Unfortunately this "special protection against attack" is partially withdrawn in Article 56.2 where these installations, including dams, dikes and nuclear electrical generating stations can be attacked if they are being used "in regular, significant and direct support of military operations and if such attack is the only feasible way to terminate such support." Whether this "special protection" will mean much, if anything, in the setting of war remains to be seen, but the recognition of these new environmental dimensions of the law of war is at least a formal acknowledgment of concern that can be acted upon by public pressures.

Whether such legal standards were applicable prior to 1977 depends on whether they are regarded as incorporating earlier treaty and customary rules of war, or as establishing something new. Note also that the 1981 Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons confidently invokes in its preamble these recent legal developments of isolating environmental protection as a distinct concern of the international law of war: "Also recalling that 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."

As has been emphasized, the attitude of the US towards these issues is both crucial and troublesome. The Enmod Convention is constructed around this threshold notion of "widespread, long-lasting, or severe." It is worth noting the statement of the US Secretary of State at the time the US signed this Convention. On that occasion, this formal statement indicated that "The United States will be prepared to re-examine this limitation on the scope of the convention at the review conference or possibly before." Even if such a threshold were to be removed it would restrict the applicability to environmental warfare per se. It would still not reach the problems associated with long-term environmental effects of nuclear and other weapons of mass destruction.

A final set of observations is needed in order to clarify the extent to which treaty law is not exhaustive of the content of the international law of war. There is no doubt that the codification conferences at the Hague in 1899 and 1907, as well as such subsequent efforts in Geneva in 1949 and 1977, arose in relation to a pre-existing set of rules of customary international law (patterns of practice performed with a sense of obligation), as well as with notions of natural law (norms of behavior binding on all levels of social organization without any particular manifestation of a consent to be bound). More recently, in addition, there has come to exist the idea of a community competence to legislate binding norms by consensus (or overwhelming vote). The grave limitation of these sources of law is that they are not operationally binding, it seems, on political leaders, military planners, or others who act on behalf of the state. At the same time, these legal directives should not be neglected. They point to the directions which public efforts to influence international behavior should take. Also, by providing a kind of legal underpinning, they accord public demands for restraint with an aura of legitimacy, justifying, it would seem, certain forms of opposition, or even resistance, by individuals, groups, and international institutions, to official policies and practices of state.

A most important concept embedded in "unwritten" international law was set forth in the so-called de Martens clause found in the Preamble to the 1907 Hague Convention IV, the latter version presented here:

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.

Again, this orientation towards applicability beyond the orbit of consent is carried forward in a provision contained in each of the four 1949 Geneva Conventions on the humanitarian side of the law of war, as well as in the two 1977 Protocols additional to the 1949 Geneva Conventions and in the 1981 Convention on Conventional Weapons. It would seem plausible to argue that a fair reading of this language is irreconcilable with any legal role for weaponry of mass destruction. Note particularly that such a concern is wider than nuclear weaponry and extends to biological, chemical, and radiological weapons as well as to some emerging categories of conventional weapons.

Also relevant here is the general international-law prohibition on intervention in the internal affairs of sovereign states, a norm that is almost logically mandated by the existence of a world of states each of which claims territorial sovereignty. There are a variety of indications, enjoying varying degrees of confirmation, that covert operations directed at foreign societies that include hostile activities have been directed at cash crops and the like.

Extensive hearings on the US Central Intelligence Agency (CIA) in the US Senate a few years ago investigated, among many other intelligence abuses, "the illegal possession of deadly biological poisons which were retained within the CIA for 5 years after their destruction was ordered by the President, and for 5 years after the United States had entered into a solemn international commitment not to maintain stocks of these poisons except for very limited research purposes." It seems evident that covert operations harmful to the natural environment of a foreign country are prohibited by the non-intervention norm, for instance as set forth in detailed form by the United Nations General Assembly, but the effective implementation of this norm requires intensifying the overall cultural inhibition that acts upon doing deliberate harm to the natural environment. International law, standing by itself, is not very helpful unless its content is reinforced by widely supported cultural norms.

Roberts and Guelff assert correctly that, "Perhaps the most fundamental customary principle is that the right of belligerents to adopt means of injuring the enemy is not unlimited." They point out that this notion was adopted by the 1874 Brussels Declaration and was formally codified in the 1899 Hague Convention II and the 1907 Hague Convention IV. This latter treaty provides an authoritative statement of the principle in its Article 22. The United Nations War Crimes Commission in the so-called Nuremberg judgment of 1946 held that the 1907 Hague Conventions as such were declaratory of the laws and customs of war, and hence binding on all states, whether or not they were parties who had given formal consent.

These notions are relevant and important for two reasons. First of all, such a framework establishes a legal context that makes calls for extensions of the law of war to the subject matter of environmental protection a matter of implementation, rather than of innovation. Second, "public conscience" is authoritatively acknowledged as a source of law and policy guidance, making such instruments as the World Charter for Nature more legally operative than generally supposed. Third, the crystallization of "public conscience" through the activities of informal groups and non-state initiatives is relevant to discerning the content of *existing* international law. In essence, the state cannot altogether defeat the formation of international law by withholding its consent.

As indicated, the case for legal development of environmental protection against military activities is overwhelming, yet the prospects are rather bleak. It can be confidently asserted that there exists "evidence of the general opinion that the protection of the environment belongs to the recognized principles of the laws of armed conflict." In addition, there is the more specific, yet limited undertaking set forth in the Enmod Convention.

Recalling the law-creating role of "public conscience," wider efforts are appropriate, both to reflect the levels of concern that exist and to bring pressure to bear on the military policies of governments in the leading states. Four types of emphasis are suggested in summary form.

1. *Prohibitions and limitations on the threat and use of nuclear weapons*--There is a growing body of expert commentary and lawyers' concern with the status of nuclear weapons under international law. Also, there are a variety of public pressures to re-align strategic doctrine away from its current levels of dependence on nuclear weaponry, thereby making relevant legal undertakings of even a declaratory character--for instance, declarations of no-first-use of nuclear weapons. Other developments in monitoring technology (the so-called transparency revolution) and drastic or abolitionist variants of minimum deterrence, offer humanity some realistic grounds to hope for and to demand nuclear disarmament. It is hardly necessary to emphasize that no single step will be more supportive of environmental quality than reductions in the risk that nuclear weapons will be used, especially on a large scale (i.e., in excess of say, 100 MT). Other weapons of mass destruction and a variety of emerging weapon technologies also pose serious threats of environmental disruption.

2. *International environmental impact statements on military activities and capabilities*--There is a definite need to facilitate public awareness in the context of environmental harm arising from military activities and capabilities. A useful contribution, building possibly on existing customary legal norms, would be an annual review of the environmental impact of military activities and capabilities. Such an effort could probably be undertaken most usefully at this stage by a non-governmental scientific organization of widely recognized high standing.

3. *Formulation and advocacy of a convention on ecocide*--A proposal for a convention on ecocide derives its inspiration from the successful adoption of the 1948 Convention on the Prevention and Punishment of the Crime of Genocide. The Genocide Convention became incorporated explicitly into international law, in the aftermath of the Nazi holocaust--largely, it might be noted, through the devoted efforts of a single individual, Raphael Lemkin. Alas, acts of genocide continue. However, the criminal character of genocide has been confirmed, a reality that lends a measure of support to all international efforts on behalf of the victims of genocide.

To formulate and promote a parallel convention with reference to deliberate, systematic environmental destruction would itself be educative. To the extent that governments could be induced to adhere to such a convention, it might draw into question within military bureaucracies practices and capabilities having an objective of environmental destruction. At the very least, designating ecocide as a crime of state would contribute to the

hardening of cultural norms on safeguarding the environment and would thereby give content to the law-generative notion of "public conscience."

4. *Formulation of cultural norms in opposition to military activities that cause direct or indirect environmental harm*--The analogy to the movement against nuclear weaponry is relevant in considering the normative underpinnings related to environmental disruption. Religious bodies, in particular, have both reflected and contributed cultural norms in opposition to the military policies and practices of nuclear weapon states. The pastoral letter of US Catholic bishops on nuclear weapons issued in 1983 exerted an enormous impact on public opinion, undermining societal support for the logic of deterrence and the nuclear arms race. The emergent cultural consensus against nuclear weapons also stimulates interpretative efforts and the level of concern about legal status.

It would seem appropriate to stimulate a comparable societal movement with respect to environmental issues. The 1972 Declaration of the United Nations Conference on the Human Environment and the 1982 World Charter for Nature move in this direction within international forums. More specificity of analysis and prescription could facilitate serious questioning of governmental policies. In this respect, a pastoral letter or encyclical on the sacred character of the human environment could powerfully reinforce secular efforts as well as make an independent contribution. The civilizational stance on nature, as has often been pointed out, is profoundly problematical, even in biblical contexts. The case for authoritative clarification of cultural norms can only improve the atmosphere within which other more formal and technical efforts are made. Governments are staffed by human beings sensitive to shifts in normative settings and cultural attitudes. The time is ripe to sharpen the tensions between cultural norms protective of the environment and military activities threatening to it.

3. Nuclear Testing

a. *Stare Decisis and Environmental Impacts*³

The question of the legality of France's nuclear test series, commenced on July 2, 1966, in French Polynesia, was of great interest to me not only because of its obvious importance as a matter of international law, but also because of its possible significance for legal theory. Under the typical view of *stare decisis* in judicial decision-making, if the relevant facts of a new case are similar to the facts of a previously-decided case, then the new case should be decided in the same way the prior case was decided. Yet it seemed to me in 1966, thinking about the French nuclear tests, that this basic notion of adherence to precedent might be in need of revision in certain kinds of cases. The French government, after all, could cite as a precedent the fact that the United States had conducted nuclear tests in the South Pacific. Unless I could show that the French testing program was factually different from the prior American tests, there would be no persuasive way to distinguish the two testing programs. In that event, one would have to concede the legality of the French nuclear tests.

I proceeded to examine various ways the French nuclear tests could be different in salient respects from the prior American tests. Of course, there are always minor factual differences between any two legal precedents. The question was whether the differences were important and significant enough to count as legally distinguishing factors.

In thinking this problem through, an idea occurred to me that I had not before encountered in my readings in legal theory and jurisprudence. It is a simple but perhaps startling idea: that in some (possibly rare) cases, the very fact that a precedent occurred is itself enough to change the situation so that it cannot be used as a precedent to justify similar cases that follow. In other words, even though a subsequent case *B* is "on all fours" with a precedential case *A*, nevertheless the fact that *A* came first may itself be sufficient to deny to *B* any legal justification derived from the workings of *stare decisis*.

The way this strange legal result might obtain is in the special event when *A* alters the environment so that the environment itself is not the same when case *B* comes along. We normally do not think of the environment of a case in the same way that we think of the facts of the case; the environment constitutes "background conditions" that we assume remain the same. But I was struck with the idea that nuclear tests can have a devastating effect on the environment in which they are conducted. That environment can be altered by the tests so that it is not the "same" environment when a new testing program is envisaged.

In 1966-67 when I wrote the following essay, there was little public consciousness about the environment. Public awareness of the fragility of the global environment began in the 1970s. It was something of an innovation to refer to the fragile oceanic environment of the South Pacific in an argument about an issue as important to national security as nuclear tests. Yet the argument was central to my thesis about the French tests. After considering other factual differences between the American and French tests, I argued that even though the oceanic environment might recover from one series of nuclear tests, it would be a weakened environment that could be vulnerable to an irreversible blow by a second series of tests. A species of organic life could be endangered by the first set of tests,

and destroyed forever by the second series. Thus, in the admittedly special case of *environmental* damage, a series of legal precedents has an effect opposite to that of *stare decisis*. In ordinary legal theory, each succeeding case helps reinforce the underlying rule derived from the precedential cases; the rule becomes stronger with a "line of cases." But in the new kind of case represented by the French nuclear tests, each succeeding case *weakens* the precedential value of the prior cases. In short, if case *A* is legally justifiable, case *B* is less justifiable--or not justifiable at all--given the existence of *A*.

[Editor's Note: The following constitutes an excerpt from the article referred to in the previous paragraph.]

French Polynesia consists of 130 small islands, of which Tahiti is the largest and most famous, located approximately 2,400 miles south of Hawaii, 4,200 miles east of Australia, and 5,000 miles west of Chile. The islands comprise a land area of 1,544 square miles and support an intra-migrant population of approximately 90,000 "Polynesians," a unified racial stock descendant of the Maori. The main French test base is located on Mururoa Atoll in the Tuamotu Archipelago, one of five major archipelagos. Other facilities include a jet airport on Hao Island and two subsidiary airstrips on the Anaa Atoll. Housing and facilities for French personnel, currently numbering over 13,500, are located primarily on Tahiti in the Society Islands Archipelago 750 miles northwest of Mururoa. In order to make room for the ever increasing number of French scientists, technicians, and military personnel, a company working with French capital has been buying, under threat of expropriation, many of the largest and best residential properties in Tahiti. In the twelve months prior to July, 1966, rent on Tahiti increased 18 percent and the general price index rose 15 percent.

In the 1840s, France had established protectorates over most of the small autonomous kingdoms on the various islands in Polynesia or "Oceania," and by mid-1880 France was treating the entire cluster of islands as a colony. The actual administration of the area as a single entity dates from 1903. After the second world war French Polynesia was denoted a "French Overseas Territory" under the French Union of 1946 and has retained that status under the new French Community of the Fifth Republic as a result of the referendum of September 28, 1958.

Several nations, including Australia, New Zealand, Chile and Peru have lodged diplomatic protests with France concerning the proposed nuclear tests. In addition, Chile has suspended commercial relations with France. Several other countries, including the United States, have at times refused to transport French personnel to the islands, citing the Nuclear Test Ban Treaty of 1963 in support of their refusal, but France has managed, using different national airlines, to staff the test sites to its own satisfaction. The initial explosion on July 2, 1966, of a nuclear device believed to have an explosive force of less than one megaton of TNT elicited official statements of regret from the United States and British Governments (the Soviet Government did not comment upon the test, which occurred just after President de Gaulle's visit to Moscow). However, the initial French tests have been confined to low-yield atomic weapons; hydrogen bombs are not expected to be exploded until the latter half of 1967 at the earliest. No prediction can be made as to the intensity of international reaction to the hydrogen bomb tests on the basis of diplomatic reactions in 1966 to the first few atmospheric low-yield tests.

The lack of pervasive international condemnation of the initial tests in the French series was not paralleled by local Polynesian reactions. Seven months before the first explosion the *New York Times* reported that "the native population is almost unanimously opposed" to the test program. Tahiti's Deputy to the French National Assembly is on record as having voiced strenuous opposition to the tests on the grounds of radioactive fallout in the atmosphere and nuclear pollution of the sea effected by the migration of fish and the drift of plankton. The President of the French Polynesian Territorial Assembly has publicly declared his opposition to the proposed tests, as have other leading citizens--including Frenchmen long resident in Polynesia--despite risk of reprisal from the French authorities.

If arguments concerning the potential nationhood or partial sovereignty of Polynesia⁴ are accepted, we may conclude that the Polynesian people have a basis for an internationally cognizable complaint. Yet, the complaint cannot persuasively be made in the abstract; it must be grounded in the predictable damage that the French nuclear tests will do to the territory and people of Polynesia. The low-yield nuclear tests started on July 2, 1966, and continuing for several months thereafter at the rate of about two explosions per month have apparently not caused so far a significant impact on the marine life of the area nor significantly polluted the atmosphere. But the test program will increase in megatonnage; the high-yield hydrogen bomb devices will be detonated in 1967; and it may even take several years after that for the impact of the damage to the area caused by nuclear shock-waves and fallout to be scientifically assessed. Thus, only general and admittedly vague predictions can be attempted at the present time.

Clearly the tests will contaminate some, and perhaps much, of the fish in the surrounding waters of the test sites. Given the intra-migrant character of the population and its dependence upon fish as a staple item of the diet, some danger from this source to the population is incontestable. Moreover, radiation could indirectly upset the genetic balance of marine organisms in the area. The people themselves may be adversely affected by direct

radiation. Precedent for this is afforded by the Marshall Islands tests conducted by the United States in the early 1950s. A United Nations Visiting Mission to the Marshall Islands in 1956 reported that skin contamination from these tests, despite the elaborate precautions taken by the United States authorities, was notable in the case of three island groups and extensive in the case of the Rongelap Islanders. The people had suffered from irradiation in three ways: penetrating gamma radiation from the ground, trees and houses affecting the whole body; skin contamination from fallout; and internal contamination from the ingestion of contaminated food and air. White blood cells were depressed to about 50% of normal and platelets to 30% of normal four to six weeks after exposure to radiation, thus drastically increasing susceptibility to other diseases and infection. Finally, with respect to the homes of the inhabitants, the Visiting Mission concluded that displacement from homes in Bikini and Eniwetok "is likely to be permanent."⁵ Since the tests in Polynesia are to be conducted on islands that form an integral part of the territory, since many fishermen use these islands at least as temporary bases (there are few actual homes on the islands selected by France for the test sites), and because France has neither the technical experience of the United States nor the financial resources which may be devoted to safeguarding the test sites, it may well be argued that the French tests constitute at least as great, and perhaps a greater, threat to the people of Polynesia than those of the United States constituted to the Marshall Islanders. When coupled with the internationally cognizable interests of the Polynesians (compared to the "strategic trust territory" permissiveness of the United States' tests), important doubts are raised whether the international community could or would accept the French claim of legality as to its nuclear testing program.

A second category of interests may be characterized by the rubric "freedom of the seas" (and of the superjacent airspace). As Professor McDougal has demonstrated, this really means freedom to *use* the seas for reasonable purposes. Some of these purposes might include the temporary use of an exclusive area of the seas for naval maneuvers, military exercises, or perhaps nuclear testing. Any given claim for a use of the seas must be balanced against the reasonable competing claims of other nations for the use of that portion of the seas for traditional purposes. It is fortunately unnecessary here to examine the general relationship between these claims, for other writers have done so at some length. The relation between nuclear tests on the one hand and fishing and navigation rights on the other have been dealt with extensively.⁶ Also studied have been the relationships between nuclear tests and air and sea pollution, nuclear tests and evolving standards of humanitarianism, and nuclear tests and the Hague Conventions of 1899 and 1907 and the Geneva Protocol of 1925 on Poisonous Gases. While no one is in a position, in the light of present knowledge, to make a definitive weighing of the competing interests with respect to the French nuclear tests, all reports of the French preparations and the manner in which the tests series has been started in 1966 indicate that the test program is to be relatively long in duration and will cover a variety of weapons (hydrogen bombs, missiles, safety devices, and so forth). It is therefore possible that considerable damage will result to fishing in the area and that navigation and airline routes will be interrupted for a long period of time. Furthermore, due to the additive effects of nuclear radioactivity, it is altogether possible that tests in the Pacific Ocean prior to the French tests might have approached the maximum tolerance levels for the bird, marine and animal life in the area. Additional deposits of radioactivity from new tests might exceed these levels and thus constitute a qualitative difference in the danger threshold. The notorious disagreement among scientists as to the quantification of the danger of radioactivity to living organisms does not invalidate this reasoning, for it is clear that every living organism has its own maximum tolerance level and that an increase in the general amount of radioactivity in an area carries with it the statistical likelihood of surpassing this tolerance level for at least some of the organisms in the region at a certain distance from the test sites. The cumulative effect of nuclear testing can only serve to increase the danger to organisms in the area. Any new dose of radioactivity might be a death blow for large numbers of organisms. Moreover, the extinction of any particular species of life in the area may carry with it a threat to the genetic balance in an even larger area. Additionally, it must be noted that, even if the initial French tests of low-yield nuclear devices do not cause significant or notorious damage to the living organisms in Polynesia, the line between reasonableness and unreasonableness in this regard may be crossed when the French decide to explode hydrogen bombs in 1967 or 1968. Thus, even if the United States' nuclear tests can be said to constitute a "precedent" for nuclear tests in general, the very notion of precedents may be unreasonable in a situation where the cumulative effect of nuclear tests (and an acceleration in magnitude within a particular "test series") may be of a different qualitative order of tolerability compared to the effect of the prior tests that are cited as a legal precedent. And, in turn, this factor must be balanced against the competing interests of other nations in the traditional uses of the high seas in the test-site area.

Moreover, a reasoned consideration of the probable effects of the French tests in the South Pacific cannot stop with those tests alone. One must also take into consideration the argument that, if the French tests are regarded as legal despite due account being taken of all the preceding factors, then it may be difficult, if not totally

unreasonable, to draw a line after the French tests prohibiting new tests by other countries in the Pacific Ocean. For the United States' tests could be thought of in terms of a bipolar balance of power, or "balance of terror," whereas the French tests, as we have seen, are difficult to justify in terms of international security. Or, to put the matter differently, bipolarity is obviously a numerically limited concept, but multipolarity--or simply nuclear proliferation--cannot justifiably be cut off at the fifth, eleventh, seventeenth, or twenty-second Power. The relevance of this consideration to the argument of the international uses of the high seas is clear. If every nation had the right to test its own nuclear arsenal in the Pacific Ocean, would there be any "regime of the high seas" left for peaceful uses? Would it not be obvious that the natural balance of oceanic life would sooner or later be upset? Would not the risk increase almost to a certainty that innocent persons outside or non-culpably inside the various warning zones would be injured or killed by the direct blast effects? Indeed, the "traditional" uses of the seas might be extinguished, not balanced.

A third category of interests includes those of nations which might be directly affected by fallout from the French tests. Nuclear fallout could carry eastward toward South America or southwestward toward Australasia by the winds which circulate the high-pressure region of the Tuamotu island group. Contaminated water may be carried by ocean currents toward New Zealand or Australia on a south-southwest swing, or eastward toward the coast of South America to be picked up by the Humboldt Current which runs upward along the South American coast. Additionally, the entire continental and oceanic Southern Hemisphere will receive an equitable distribution of stratospheric fallout. Again, with respect to all these factors, no theoretical dividing line exists between danger and acceptable tolerance upon which all can agree. Yet the French tests will add to other radiation in the area from previous nuclear tests and perhaps exceed the tolerance level for human safety and the safety of food consumed in the countries mentioned. Diplomatic protests concerning the French tests from countries such as Australia, New Zealand, Chile and Peru attest in part to the reality of these dangers.

Finally, the category of general international law may be cited, since international law is itself the manifestation of rules of reasonable accommodation among nations, and thus expresses the general interest of all states. Two general rules are immediately relevant. First, under the Genocide Convention ratified by France on October 14, 1950, France has a duty to any ethnic group within the actual or claimed jurisdiction of France to desist from any act "committed with intent to destroy . . . in part . . . [an] ethnic . . . group . . . [by] causing serious bodily or mental harm to members of the group."⁷ As reported by the official UN Scientific Committee on the Effects of Atomic Radiation, atmospheric nuclear tests may very well have the effect of causing serious bodily or mental harm to nearby population groups.⁸ An argument might be advanced that, in light of this possibility, any atmospheric nuclear weapons test which could have these effects on an ethnic group such as the Polynesians would be illegal under international conventional law. Second, the Moscow Test Ban Treaty of 1963 may itself have started, or at least acknowledged, a general rule of customary international law dating approximately from 1963 to the effect that all atmospheric tests of nuclear weapons are illegal. The nearly universal acceptance of the treaty indicates an international consensus of overwhelming force in favor of the principles contained therein. Additionally, the treaty and subsequent practice under it (*i.e.*, restraint from conducting atmospheric tests and restraint from withdrawing from the treaty under its withdrawal clause) can be argued to be the equivalent of the practice and acquiescence of states to a rule banning atmospheric nuclear tests even in the absence of a treaty. As in any area in which a customary principle is claimed, the basic importance of the Test-Ban Treaty here is the overwhelming (not necessarily universal) expectation of the peoples of the world about the unlawfulness of atmospheric nuclear testing.

It is evident, in conclusion, that a large number of interests and legitimate claims must be assessed, if one is to attempt to come to a determination as to the legality or illegality of the French nuclear test series. These competing interests are substantially different from those which have been articulated in connection with previous atmospheric nuclear tests, and that to rely therefore on a superficial precedential similarity would be unjustified.

b. Warring Concepts of Sovereignty⁹

As this anthology was going to press in the summer of 1995, the French government was finalizing its plans to test nuclear weapons in the South Pacific.¹⁰ Public opinion in Australia has been bitter in opposition to the French tests, and consumers have boycotted French products.

The planned tests have elicited many commentaries, including thoughtful op-ed essays in the *New York Times* by Thomas L. Friedman.¹¹ He writes that Australia and France are clashing over two very different concepts of sovereignty:

a traditional, inward-looking nationalistic form of sovereignty, embodied in President Jacques Chirac's Gaullism, and a very broad, expansive, forward-looking new notion of sovereignty embodied in environmentalism.

The concept of environmental sovereignty, Mr. Friedman explains,

says my home, my space, isn't just limited to my borders on a map. It includes the air I breathe, the water off my shore and the whole extended food chain upon which I rely. Environmental sovereignty is not confined either by conventional borders or conventional time.

Environmentalists have a different conception of time than politicians or army generals. The French government says that there is no danger of the Mururoa Atoll fracturing or leaking radiation from its tests. Mr. Friedman replies: "Well, maybe there is no leakage today, but what about in 50 years? 200 years?"

In the French view of the world, France is "home" and the rest of the world--where the French government can engage in "safe" nuclear testing--is "away." Mr. Friedman says

In the environmentalist view of the world, there is no "away." The whole globe is home, so away is home and home is home.

He refers to the Australian writer Paul Sheehan, who views the clash between France and Australia to be "the first real confrontation between a traditional superpower and an ecological superpower."

On the surface, Australia's bitter opposition to France's plans to conduct nuclear weapons tests in the South Pacific next month needs no explanation. I mean, how would you feel if someone came from the other side of town to test his toxic fertilizer on your backyard? "But it's totally safe," say the French. Safe? ask the Aussies. Safe you say? If it's so bloody safe, then why don't the French test their bombs under Euro Disney and not half a world away beneath the coral of the Mururoa Atoll?

A good question, and just one of the reasons why it's impossible to exaggerate the depth of popular indignation here at President Jacques Chirac's decision to resume nuclear testing in Polynesia, thereby violating the de facto ban on such explosions that every nuclear power except China has been observing. No wonder French bakeries in Sydney have had their windows smashed, French cars their tires sliced, French products boycotted and a French Consulate firebombed. "We are not at war," the French Ambassador to Australia complained--just before he boarded a plane to Paris after being summoned home by his Government.

Ah, but the Ambassador was wrong. Because beneath the surface, this is a war. It is a war between two very different concepts of sovereignty, and one we are going to witness more and more of in years ahead. It is the clash between a traditional, inward-looking, nationalistic form of sovereignty, embodied in Mr. Chirac's Gaullism, and a very broad, expansive, outward-looking new notion of sovereignty embodied in environmentalism.

Scholars have long argued that Gaullism is a form of psychotherapy, an ideology invented by Charles de Gaulle to rebuild French dignity after the excruciating humiliation of being defeated by the Nazis and liberated by the Americans. The Gaullist in Mr. Chirac says that France, as a self-proclaimed Great Power, must maintain an independent nuclear option, and an independent military identity. Therefore, it will test the newest weapons in its nuclear arsenal, because that is the French national interest. And if the rest of the world doesn't like it, well, all the better. That is the fun of being a Gaullist. I detonate, therefore I exist.

What the French, who have no environmental movement, have totally missed is the development elsewhere in the world of a concept of environmental sovereignty. Environmental sovereignty says my home, my space, isn't just limited to my borders on a map. It includes the air I breathe, the water off my shore and the whole extended food chain upon which I rely. Environmental sovereignty is not confined either by conventional borders or by conventional time. That is, the French say there is no danger of the Mururoa Atoll fracturing and leaking the massive radiation that has been trapped in the volcanic rock beneath it from 139 French underground nuclear tests since 1975. Well, maybe there is no leakage today, but what about in 50 years? 200 years?

In the Gaullist view of the world, there is France and there is the rest of the world, there is "home" and there is "away," and where you test your nuclear weapons is away--way, way, away. In the environmentalist view of the world, there is no "away." The whole globe is home, so away is home and home is home.

One reason Mr. Chirac has to play out his Gaullist fantasies in the South Pacific is that he can't play them out in Europe anymore. There, French nationalism has been repressed because France has surrendered part of its sovereignty to be a member of the European Union, and a united Europe. France's E.U. partners would never allow it to test in Europe.

This clash between France and Australia, observed the Australian writer Paul Sheehan, will be the first real confrontation between a traditional superpower and an ecological superpower.

But a clash it will be. Mr. Chirac insists he will plow ahead with his tests. He is wrong. It is a mistake. And, as they say around here, the bomb's gonna boomerang. If the French President had any sense he would heed the message of a popular Australian bumper sticker. It says simply: "Don't Blow It Jacques."

B. Dismantling Chemical Weapons¹²

The startling successes of contemporary international arms control negotiations call to mind the old aphorism

that one should be careful about what one wishes for, because the wish just might come true. Today, disarmament diplomacy has wrought unprecedented triumphs across a wide range of global bargaining issues, producing a series of watershed treaties that offer spectacular new advantages for the security of the United States and for the prospect of enduring world peace. At the same time, however, these unanticipated negotiation breakthroughs have themselves generated unforeseen implementation problems, spawning a host of novel difficulties for which the traditional tools and methods of arms control are ill-prepared or inappropriate.

This Article examines one such difficulty: the potential legal and political conflict posed when a dramatic and crucial new arms control agreement, the 1993 Chemical Weapons Convention (CWC),¹³ confronts the equally fundamental and pressing dictates of national environmental protection policy. In short, the CWC will mandate the peaceful dismantling of massive national arsenals of now obsolete, but still exceptionally lethal chemical weapons (CW) agents, armaments, and facilities--and the destruction must be accomplished relatively promptly, reliably, and under the supervision of international inspectors. In the United States, however, long-standing environmental legislation, starting with the National Environmental Policy Act of 1969 (NEPA) and continuing through a sequence of resource-specific antipollution enactments, mandates punctilious adherence to procedural safeguards (such as the preparation of disclosive Environmental Impact Statements) and compliance with stringent national and local substantive standards on emissions, hazardous wastes, community participation, and safety.

At present, there is no established technology that can credibly promise to dismantle the United States CW stockpile in a manner that is entirely consistent with both of these sets of legal compulsion. Unless some Solomonic and politically tolerable mechanism can quickly be invented, therefore, the United States (and other treaty parties) may be forced to depart from one, or both, of our hard-fought priorities: it is not entirely clear, at this point, that the United States can simultaneously remain fully faithful to the language and spirit of both the CWC and the NEPA. Under those circumstances, arms controllers and environmentalists are suddenly cast into the uncomfortable, mutually-antagonistic posture of asking which set of laws should the country abandon, modify, defer, or violate?

1. Dismantling Obligations Under Prior Treaties

Earlier iterations of arms control efforts had adopted several distinct attitudes toward the disposal of the regulated weaponry. At the simplest level, the 1925 Geneva Protocol on chemical weapons constituted essentially just a "non-use" regime, permitting its parties to retain and augment their CW arsenals unconstrained. Other treaties basically amounted to mere geographic limitations upon the deployment or positioning of weapons, rather than prohibitions or limitations upon their possession, and therefore did not mandate any numerical reductions. In a similar vein, some arms control treaties attempted to constrain the testing or development of new types of weapons, but these, too, failed to prohibit continued production or deployment of the existing types. Moreover, several prominent international arrangements--notably, the 1968 Non-Proliferation Treaty--are designed to inhibit the spread of a designated weapon capability, without directly requiring the states that already possess the specified arms to dismantle or otherwise limit them.

In other instances, a treaty established numerical ceilings upon the parties' permitted weaponry, but deliberately set those caps so high that little, if any, actual dismantling was contemplated. The two SALT I documents (the 1972 Anti-Ballistic Missile (ABM) Treaty and the 1972 Interim Agreement on Strategic Offensive Arms) and the 1979 SALT II Treaty essentially fit this description. Even in those cases where a treaty purported to abolish a category of weaponry altogether, as with the 1972 Biological Weapons Convention (BWC), it typically dealt with weapons that no country had actually deployed in sizeable numbers, and little attention was consequently paid to the question of how to verifiably and safely dispose of the now-illegal arms.

Moreover, on those occasions when the disarmament obligations did amount to compulsory dismantling, the enforcement timetable was generally gradual; the quantities and locations of the weapons were well-known; and the verification methodology was mainly via remote, satellite-based reconnaissance, as opposed to intrusive on-site inspection. Most important, these treaties typically required destruction of only the "launcher" or the "delivery vehicle" (i.e., the missile silo, missile, airplane, or other device for containing the warhead and transporting it to the intended target) instead of mandating disassembly of the explosive or lethal element (i.e., the warhead or bomb) itself. Therefore, treaty negotiators did not usually concern themselves with the interstices of the dismantling process, being content to leave the operational details of the elimination to subsequent deliberations--political conditions simply did not yet permit the disarmers to pursue more effective and creative solutions.

Even at this modest level of arms control, controversies were frequent. Critics asserted that by focusing exclusively on the launchers and delivery vehicles, the United States was inadvertently permitting the Soviet Union or others to continue to stockpile dangerous weaponry without effective limits. Allegedly, these latent arms could be brandished with decisive effect in some hypothetical "breakout" scenario, in which a rogue country would suddenly abrogate its disarmament obligations, pull a ream of functioning weaponry out of well-maintained retirement,

quickly remanufacture any necessary associated elements, and then seize an advantage over other countries that had not so assiduously sustained their re-armament capabilities.

Similarly, there was plenty of grist for critics to argue that the Soviets had incompletely complied with those few treaties that did mandate some degree of dismantling. Even where the retired weaponry was patently no longer useable--the equivalent of being disassembled and left to rust in an open field--punctilious attention to the legal standards seemed to require more.

Through it all, the leading negotiating parties, as well as those monitoring their progress, consistently reasserted their dedication to the goal of more meaningful reductions. Numerous treaties and international declarations cited, with almost liturgical fealty, the ultimate objectives of "nuclear disarmament" or "general and complete disarmament" even as they were notching only very small increments toward that nirvana. The actual practice of arms control gradualism succeeded in bringing only a precious few weapons from the active stockpile to the scrapyard.

This lackadaisical approach to dismantling, however, was altered forever with the 1987 Intermediate-Range Nuclear Forces (INF) Treaty, which abolished an entire category of deployed nuclear arms and established exacting procedures for destruction or retirement of the missiles. Under the INF Treaty, unique elimination procedures are identified for each category of weaponry and supporting equipment. These procedures define specific methods, such as explosive demolition, burning, crushing, flattening, or cutting the item into pieces. The INF Treaty set a new standard for punctilious attention to the details of the dismantling process, and the eliminations it contemplated were all completed on schedule, with a minimum of political or technological snafus.

For all of this excruciating exactitude, however, the INF Treaty still did not require destruction of the nuclear warheads formerly deployed atop the destroyed ballistic and cruise missiles. Both the United States and the Soviet Union contemplated the possibility of reusing those explosive devices, or the fissile components, in future generations of weaponry, and they both insisted upon retaining the right to stockpile the radioactive material, even as they were crushing and burning the INF delivery vehicles. This approach, under which the INF Treaty arguably did, or did not, constitute a real reduction in the nuclear threat, was roundly criticized by Senator Jesse Helms, among others, who alleged that, "The truth is that not one nuclear weapon--not a single nuclear warhead--will be destroyed under the terms of this Treaty."

The INF Treaty, furthermore, provides inadequate guidance for the CWC dismantling process in another important respect because it fails to include any specifications related to environmental protection. Neither the INF Treaty itself, nor its detailed protocols, established any standards or articulated any principles to circumscribe the environmental impacts of the disarmament. Even the simple expedient of disposing of unarmed missiles by launching them into the ocean was approved.

Other recent arms control accords have adopted similar postures. The 1991 START I and 1993 START II agreements reflected the Reagan and Bush administrations' view that real reductions in strategic nuclear arsenals, rather than simple caps on the rate of increase, were essential. The mandated "deep cuts" in strategic weaponry will alter forever the prior "balance of terror," and the intrusive verification arrangements provide a degree of openness previously considered unthinkable between suspicious superpower antagonists. Hundreds of missile launchers, submarines, and airplanes--but again, not necessarily the actual warheads--will be reduced by both sides in sequential phases over a period of years. The START accords extend the verification breakthroughs initiated in the INF Treaty, including agreement upon a system of "portal/perimeter" monitoring, whereby each party allows the other to station permanent inspectors outside the formerly secret facilities where missile components or other sensitive military apparatus are produced. In some instances, a facility itself is to be disassembled or converted to civilian applications. In other cases, foreign inspectors are entitled to enter the plant site to take measurements or install "black box" technical monitoring equipment, or to observe all outgoing traffic to ensure that no contraband hardware is shipped from the plant. These verification assurances amply support START's detailed provisions regarding weapons destruction, but as with the INF Treaty, they are silent regarding any possible environment-, health-, or safety-related limitations, standards, or protections.

In the same vein, the 1990 Conventional Forces in Europe (CFE) Treaty strongly stresses the importance of achieving a permanent reduction in non-nuclear military capacity by requiring the disassembly of huge quantities of tanks, armored personnel carriers, helicopters, and other devices. Like the INF Treaty, it specifies precise procedures for neutralizing each type of covered equipment, and it provides for detailed on-site inspection to ensure fidelity to the agreed standards. The CFE Treaty, however, retains for each party "the right to use any technological means it deems appropriate" to accomplish the requisite eliminations, and it, too, imposes no environmental, safety, or other inhibitions.

Finally, it is noteworthy that several of these recent international accords and governmental actions have

sponsored, in various ways, the "conversion" of selected defense resources to civilian purposes. At the smallest level, the CFE Treaty contemplates that some of the regulated hardware--individual trucks and tanks, for example--may properly be dewatered and converted to heavy-duty nonmilitary applications instead of being completely destroyed or disassembled, and it specifies steps to guard against reconversion back into military usefulness. Likewise, in the START accords, the United States and Russia have agreed that at least a few of their expensive intercontinental ballistic missiles may be saved from the scrapyard by conversion into space launch vehicles, projecting artificial satellites toward orbit, instead of weapons toward a target. At a higher level, countries have attempted to reconfigure their weapons design or fabrication facilities for more benign purposes--Russia's adaptation of a former INF missile production plant into a factory for producing baby carriages is the most conspicuous example. At a still more macroeconomic level, entire industries in the United States, Russia, and elsewhere are facing the stark challenge of converting to lower military spending, and the entire defense "food chain"--including research laboratories, test sites, production facilities, and deployment bases--is experiencing the pressures of demobilization.

Perhaps the most dramatic instance of beating swords into plowshares is the recent arrangement under which the United States has agreed to purchase, on mutually advantageous terms, five hundred metric tons of Russia's now surplus weapons-grade highly enriched uranium over a twenty-year period. The plan is to dilute the radioactive mass, rendering it unusable for weaponry, and to transform it into fuel for United States civilian nuclear power reactors. The cash payments will bolster Moscow's faltering economy at the same time that the exchange whittles away the size of the nuclear weapons threat facing the United States.

2. Dismantling Obligations Under the Chemical Weapons Convention

The above chronology demonstrates that the key weapons negotiating states have come a long way from their earlier indifference to actual disarmament. Recent accords have addressed the elimination process in conspicuous detail and have initiated the process of walking swiftly back from the abyss of "overkill." The world has already learned a great deal about the challenges of effective dismantling of military equipment and about the opportunities for conversion of defense assets to more productive applications.

The 1993 Chemical Weapons Convention, however, raises all these issues in an even more acute, intractable form. The treaty attempts to achieve the comprehensive abolition of CW arsenals worldwide--not just among two superpowers, but for all states, including several that continue to deny possession of any CW. It aims, moreover, at a permanent injunction against chemical warfare, by essaying to destroy the capability for quick weaponization of chemicals, through elimination of the facilities where the combat agents have been produced or armed. Crucially, the CWC regulates even "dual use" and "precursor" chemicals--substances which are not themselves lethal warfare agents, but which could be converted into weapons relatively easily--even when those same chemicals have become exceedingly widespread in an immense variety of civilian applications across the breadth of the international economy, ranging from pesticides to plastics to paint.

Unlike most of its arms control ancestors, therefore, the CWC will strive: (1) to eliminate the lethal warheads, not merely the delivery systems, and even to destroy the facilities formerly used to produce them; (2) to root out even small quantities of weapons, which might still prove militarily meaningful; (3) to deal with protean substances, which can be secretly converted from weaponry into benign fluids and gases (and back again) with unsettling rapidity; (4) to intrude its verification obligations upon private industry, which handles toxic chemicals in great profusion, as well as upon the more familiar governmental sector; and (5) to anticipate possible future ordnance concepts, which might midwife new types of chemical weapons even as the old versions are being dismantled.

Central to this Article, the CWC is different from even its most ambitious predecessors in yet another way: its nascent attention to the environmental implications of the dismantling process. Unlike the INF, START, CFE, and other treaties, which were silent about their potential ecological ramifications, the CWC explicitly provides that: "Each State Party, during the implementation of its obligations under this Convention, shall assign the highest priority to ensuring the safety of people and to protecting the environment, and shall cooperate as appropriate with other State Parties in this regard."

While this passage is not nearly as fulsome or as detailed as it might be (or as many other provisions of the exceptionally fastidious CWC certainly are), it does establish a basic mandate, and the parties have taken seriously their obligation to respect the environmental concerns in addressing the dismantling process.

The tasks of understanding and implementing the multifarious CWC provisions related to dismantling will now mandate some unraveling of the tortured history of the weaponry and the longstanding disarmament negotiations, asking first how the weapons and the treaty text evolved; second, what the treaty actually requires of the parties regarding dismantling; and third, what the planet's existing CW arsenal now includes.

The new treaty contains many important and novel disarmament provisions, several of which are likely to

result in major potential impacts upon the biosphere. As a comprehensive regime, the CWC requires, among other things, that each party:

(a) eliminate all its existing CW agents and weapons and promise never to reacquire them; (b) report on its production and consumption of other key chemicals and "precursors" that could be converted into weapons relatively easily, but that may also have substantial applications in ordinary, peaceful commerce; and (c) dismantle its CW-related production facilities or convert them to peaceful applications.

The timetable for accomplishing these eliminations is not leisurely. Destruction of the agents, other chemicals, weapons, and installations is to be initiated within one year of the treaty's entry into force and is to be completed within ten years; if a party, in exceptional cases, experiences daunting technological, financial, ecological, or other inhibitions beyond its control, the time frame may be extended up to five additional years.

Surrounding these basic treaty obligations is a plethora of verification commitments, through which each party incurs the responsibility for hosting a variety of types of inspections, to be conducted by an international corps of trained experts. Their function is to confirm the accuracy of parties' required reports about their chemical activities, to identify any illicit CW-related operations, to document alleged diversions of precursor or other chemicals into military programs, to deter covert evasion attempts, and thereby to strengthen confidence in the constancy of mutual compliance with the underlying bans. By guarding against the possibility of surprise "breakout" efforts, the mandatory inspection apparatus attempts to reinforce the safety of the CWC, ensuring parties that their potential antagonists are not sustaining a one-sided military advantage. Inspectors are authorized to snoop into a variety of "declared" and "undeclared" facilities (including the unprecedented opportunity to inspect virtually any public or privately owned location anywhere in the United States); to take, analyze, and remove samples of selected chemical substances encountered in the inspection; and to demand that certain types of chemical operations be carried out in their presence.

As a result of this verification imperative, CWC parties will be somewhat constrained in their choices about methodologies for accomplishing the required eliminations. It is not enough that the former CW production facilities be destroyed--they must be destroyed in a fashion amenable to confirmatory international inspections. Likewise, merely disposing of the lethal agents, even disposing of them in a scientifically reliable and comprehensive way that precludes their reconstitution, is insufficient; for the treaty to "look good" as well as "be good," the eliminations must be conducted with a fastidious attention to the established protocols and with exacting opportunities for external corroboration--even if that punctiliousness takes longer, costs more, and generates independent environmental or safety hazards.

The Convention also addresses the importance of secrecy. Since chemical weapons are so intimately connected to legitimate commercial chemical activity, any inspections that probe intrusively into the possible existence of the former may simultaneously jeopardize the hidden trade secrets of the latter. Private chemical firms jealously guard their production processes, their customer and supplier lists, their nonpatented operational innovations, and many other aspects of their respective enterprises, but the international inspectors must be given substantially free rein to ensure that only legitimate business is occurring.

Similarly, participating countries' concerns about national security secrecy may also be implicated, since chemical weapons operations are often intimately associated with other sensitive military programs that are unregulated by the CWC and that ought to be immune from inspection under it. If international visitors, under the guise of a CWC inspection, could probe unrelated defense activities and release the acquired data to neighboring countries, security could be lessened, not strengthened, in the transaction. Therefore, the CWC's stringent limitations upon access to non-CW related materials, and its injunction upon the unauthorized release of data, apply equally to national security classified materials and to private industry's confidential business information.

3. The Public Policy of Environmental Protection

The United States and other countries are much more conscious today about environmental protection issues and dangers than ever before, and people have become much more willing (even insistent) to pay a price, in financial or other terms, in order to pursue ecological priorities. A torrent of domestic environmental statutes and international treaties has reflected this newfound interest, as wasteful or polluting practices and attitudes that were commonplace only a few years ago have suddenly become abhorrent and aberrational. Environmentalism's international perspective, in particular, has emerged as a salient force, in recognition of the fact that the planet's natural resources are interconnected, oblivious to human political boundaries.]

Arms control is a prototypical field in which the concerns about environmental protection are finally gaining a firm hold. As surveyed above, the early generations of disarmament pacts were essentially oblivious to environmental responsibilities--the treaties contained no provisions related to safeguarding the environment, and the negotiators seemingly considered those kinds of issues to be outside the scope of their mandate. More recently,

however, an encroachment has begun, with the national security community at last beginning to acknowledge the linkage between weaponry and the environment, especially where dismantling of excess arms is being required.

The 1991 START I accord was the first arms control instrument for which something approaching a full-scale environmental impact statement (EIS) was prepared. Although this tome did not quite meet the formal requirements expected in other areas, it was undoubtedly a serious, substantial effort to supply the type of investigation, analysis, and disclosure demanded by statute. The document elaborately compared the contemplated environmental impact of the treaty (especially the provisions requiring the United States to retire and dismantle hundreds of strategic nuclear systems and the associated verification arrangements) with the alternative status quo option and provided an impressive, sensitive discussion of the range of relevant considerations. A similar, albeit smaller, document (styled as a supplemental legislative EIS) was prepared in connection with the 1993 START II accord.

The CWC, however, raises the stakes--and the potential clash between disarmament and environmentalism--by an order of magnitude. The chemical accord implicates such a vast array of ecological concerns, and the destruction requirements go so directly to the heart of the transaction, that environmentalism is inextricably implicated. The two social forces of arms control and environmental protection--public policy worlds that had previously only barely begun to interact at all--are now drawn into full-fledged confrontation and/or collaboration. Interest communities that have previously followed either one set of issues or the other will now require a crash course in the opposite discipline, in the hope that the combination of national concerns can be managed in a mutually supportive, rather than an entirely hostile, fashion.

a. National Environmental Policy Act (NEPA)

Any survey of American environmental law must begin (both chronologically and in importance) with the National Environmental Policy Act of 1969,¹⁴ America's "environmental constitution." For our purposes, the most important NEPA provision is the mandate that a government agency contemplating a "major federal action" must study the likely environmental impacts; the agency must collect a diverse range of data, analyze alternative courses of action, consider possibilities for avoiding or mitigating untoward environmental effects, and publish findings for public comment prior to making a final decision. NEPA itself is not "substantive" in the sense of establishing standards for permissible levels of emissions or other disruptions, and it does not require the agency to select the policy option that is determined to have the least adverse environmental effects. But the statute and the EIS process have nonetheless revolutionized the field, according environmental issues a much higher visibility than ever before and forcing agencies, through the glare of publicity (and litigation), to become more environmentally conscious and responsible.

Several aspects of the international reach of NEPA, however, have never been completely clear, and judicial cases have periodically tested the extraterritorial application of the statute, its relevance to treaties, and its role in national security matters. The D.C. Circuit, for example, has recently ruled that the National Science Foundation (NSF) must prepare an EIS regarding its intention to emplace a food waste incinerator at its McMurdo research station in Antarctica. The court did not rule that NEPA automatically applies to all U.S. government activities outside the country, and it focused on the special jurisprudential status of Antarctica. However, the court also stressed the fact that, wherever the NSF's actual construction activity might eventually occur, the NEPA EIS requirement was principally addressed to informing the foundation's decision-making activity, which naturally took place inside the United States at the agency's headquarters--so there was really no question of extraterritoriality in this application of the statute. By this logic, virtually all major federal actions worldwide could be amenable to NEPA coverage, but other cases over the years have left unresolved the extent to which the statute should be applied internationally.

Supplementing the statutory obligations of NEPA regarding the international environment is Executive Order 12,114 of 1979. It requires an agency to produce appropriate documentation prior to undertaking any major federal action significantly affecting the quality of the human environment: (1) in the "global commons" or (2) under specified circumstances, inside a foreign country. The executive order provides a number of categorical exemptions and other limitations, several of which relate to national security matters, but none of which is directly relevant to the CWC. Importantly, however, unlike NEPA, the executive order does not provide for judicial review of agency noncompliance.

The most recent major international NEPA-related controversy concerns the legislation's applicability to treaties. The statute, combined with CEQ regulations, presumptively requires the submission of a legislative environmental impact statement to accompany the transmittal to Congress of an international agreement, and the executive branch has sometimes conformed to this expectation. However, regarding the North American Free Trade Agreement (NAFTA), a monumental tariff-reducing and trade-enhancing arrangement among the United States, Canada, and Mexico, the American government has produced voluminous publications and environment-related

argumentation, but no EIS documentation. When sued over the failure to study and advise adequately about the manifest, complex environmental effects, the government asserted a number of alternative defenses in court. Some of these arguments were NAFTA-specific, and largely irrelevant to the CWC context, but others presented a more general challenge. To some extent, the executive branch seemed to be asserting that NEPA was not intended to apply to treaties at all; alternatively, it asserted that even if the statute does attempt to reach international agreements, the president's foreign affairs powers under the Constitution preclude the legislature from imposing any such preconditions upon the conclusion and submission to Congress of an international bargain.

The district judge ruled for the plaintiffs, ordering the federal government to prepare a prompt EIS, but in September 1993, the D.C. Circuit reversed. In so doing, the court still seemed to not quite have accepted the widest versions of the government's case, and the court denied that it was sounding the "death knell of the legislative EIS." But the court reasoned that the only "final action" in the case had been the President's decision to transmit the treaty to the Congress, which was not the action of an "agency" and was therefore unreviewable under NEPA and the Administrative Procedure Act. Whether under this logic there is still any scope for litigation to compel the production of an EIS for a future treaty such as the CWC remains unsettled.

In any event, the executive branch has not produced (or even begun work toward) a full legislative EIS for the CWC. Various parts of the bureaucracy have, however, undertaken intensive projects that provide at least partial substitutes for the analysis --or that could readily be incorporated by reference in a subsequent umbrella document.

For example, the largest single environmental impact of the CWC will undoubtedly be the actual dismantling of stockpiled chemical weapons. However this elimination is ultimately accomplished, the operation of the destruction facilities will have enormous and diverse potential environmental consequences, it will likely produce a wide range of routine and nonroutine emissions and residues (as well as stimulating a new risk of accidents), and it is therefore precisely the type of major federal action that demands concerted study. Fortunately, work on just that sort of investigation and documentation is already well under way. By statute, the Army was ordered in December, 1985 to begin disposal of the entire existing American CW stockpile--independent of any treaty obligation to do so--and the service dutifully began making plans, including the preparation of a nest of EISs.

But the environmental documentation prepared to date is fundamentally defective in two crucial respects. First, the existing EISs fully discuss only the location of the proposed elimination facilities, not the technology selected to perform the destruction. The Army has studied (on a programmatic basis) whether to build eight, two, or one incinerators and (on a site specific basis) exactly where, within a specified base or local plant site, to emplace each particular structure. And in this regard, the EISs do seem quite thorough and deliberative. But the Army has not, in these documents or elsewhere, adequately addressed the underlying determination that incineration, rather than any of the other candidate technologies (such as neutralization, bioremediation, and cryofracture), should be the mode of choice. By merely assuming that burning is the sole relevant option for accomplishing the destruction, the Army has evaded a central function of the NEPA exercise.

Even beyond that important defect, however, the existing EIS library is insufficient in a second key respect to support the CWC as a whole because it fails to consider all of the treaty's potential environmental impacts. For example, as noted above, the United States will be required to dismantle not only the existing stockpile of active weapons, but also the non-stockpile materiel (including a small quantity of modern binary munitions and equipment, and a much larger, more diverse, and deteriorating mass of older and obsolete arms and other CW-related items), as well as the former CW production facilities. Because the 1985 statute dealt exclusively with disposal of the active stockpile, the Army's original EIS mandate did not address the non-stockpile arms, which have become relevant only upon the conclusion of the CWC. The Army has recently prepared an initial report concerning the location and status of the non-stockpile items, but has only barely begun a true analysis of the alternative disposal methods and their environmental effects.

Moreover, the CWC will have other diverse environmental consequences of the sort that should be studied in an EIS or equivalent document. For example, under the treaty and contemplated American implementation of it, numerous types of imposing structures may be built, adapted, and/or demolished. Foremost among these, of course, will be the incinerators themselves (or any other buildings and equipment that will be required by alternative destruction methodologies); the Army's programmatic EIS concludes that the impact of constructing and later decommissioning the incinerators will be minor, but admits that the issue has not yet been studied in detail. Similarly, a number of former CW production facilities will be eliminated or converted and recycled. This activity will involve the decontamination or destruction of medium- to large-scale industrial plants, but again, the Army has not yet studied the problem in detail--although perhaps other government programs have taken an initial look at some of the locations. In addition, the treaty permits the United States to establish a "single small scale facility" for producing CW-related agents for permitted peaceful purposes, as well as certain other very limited types of CW-

related installations. The eventual consequences of the construction and operation of any of these types of facilities would have to be studied independently and carefully.

The anticipated conduct of the verification inspections under the CWC also raises environmental concerns that have not yet been fully evaluated in any official document. These activities would not involve the handling of large quantities of agent or other toxins, but they will occur on such a widespread, repeated basis that their cumulative potential environmental impacts may be substantial. For example, in visits to privately owned chemical factories, the Organization's inspectors will generally be permitted to observe activities throughout the entire plant; to take, analyze, and transport samples; and to require that specified operations be conducted in their presence. Each of these activities, together with the enhanced danger of ordinary industrial accidents (which could also have environmental implications) caused by the sheer presence of additional personnel, equipment, and operations, could be assessed and displayed to the public via an EIS.

Next, the CWC will have a potentially significant environmental impact to the extent that it achieves its anticipated objective of enhancing peaceful international commerce in civilian chemicals and related equipment. Freedom from existing individual or collective national programs of export controls, such as the restrictions maintained by the current "Australia Group" of chemical supplying countries, has long been a key desideratum of the developing countries participating in the CWC deliberations, and the treaty commits its parties to encouraging the fullest possible civilian exchange. While no EIS could foresee exactly how much increase in American and global chemical traffic will actually be realized under the treaty, a document could make some educated guesses about the probable levels of augmented chemical imports and exports and about their anticipated environmental consequences upon the United States and upon the "global commons," such as ocean shipping lanes.

The CWC will also have a multiplicity of miscellaneous effects upon the American and global environment. The treaty provides, for example, that its parties are prohibited from producing, testing, possessing, or using chemical weapons; from aiding others in doing so; and from making any preparations for engaging in offensive chemical warfare. While most of these activities are steps that the United States has not recently undertaken anyway--and has no current intention of resuming--the acceptance of a legal impediment against changing our national policy has some identifiable (positive) effect on the environment that could be discussed in a suitable EIS. For that matter, the main object and purpose of the treaty, the abolition of chemical weapons and chemical warfare, is of profound benefit to the natural environment, as well as to the human inhabitants. Prompt elimination of CW arsenals will reduce the likelihood of disastrous accidents with the stockpile and of cataclysmic intentional uses of the poisons.

Finally, the CWC, as a United States-led agreement with foreign sovereigns, will also have foreseeable international consequences for the quality of the global environment. At a minimum, the United States will continue to press other countries diplomatically to adhere to the treaty regime, and many will undoubtedly do so. Their own conduct of the dismantling functions, as well as their participation in the Organization's verification operations, the enhanced opportunities for international chemical commerce, and the rest of the activities surveyed above will also affect the biosphere. In the case of Russia, in fact, where the existing arsenal of chemical weaponry and other materials to be cleaned up is even larger than in the United States, the probable environmental effects will be especially substantial. While most of the countries will complete their CWC-required actions entirely autonomously (or with the assistance of the treaty's Organization), it is also possible that direct American financial, technological, or other assistance may also be forthcoming, again demonstrating a significant nexus to NEPA's core concerns.

4. Resolving Legal Conflicts: The Supremacy Clause

The conjunction of the Chemical Weapons Convention with the pre-existing corpus of American environmental jurisprudence poses two separate areas of potential doctrinal conflict: treaty vs. statute and federal vs. state. This section of the Article briefly analyzes both these legal antagonisms, under the rubric of the Constitution's Supremacy Clause.

a. Treaties and Statutes

It is now well settled that international agreements and congressional enactments are instruments of equivalent legal dignity beneath the Constitution. Therefore, the newer pronouncement--the later document in time--will prevail. In this instance, the CWC will provide the *lex posterior* (at least for now), and in the event of an intractable conflict, any prior United States environmental protection statutes would recede.

American courts confronted with this type of conflict, however, have been reluctant to invalidate either category of instrument and have strained mightily to weave a construction of the sequential documents that would allow both to be effectuated simultaneously. Rather than supersede wholesale the provisions of existing United States environmental law, therefore, courts reviewing the CWC would be more likely to find or create a sufficient harmony of interests such that all the relevant bodies of law could be accommodated.

Regarding the CWC, that accommodation should not be too difficult to find, at least in many instances. The CWC, in fact, contains explicit references requiring its parties to comply with their applicable national environmental protection requirements, including obtaining the relevant permits, in the conduct of verification inspections--a seeming submission to the concerns of state and local governments. On the other hand, the treaty also does require that the dismantlings and inspections actually be conducted as specified--local environmental impediments would not provide a valid excuse for bovine nonperformance.

For their part, United States environmental protection laws are not intended to stand up rigidly against overriding foreign affairs imperatives, and they generally do not purport to make environmentalism any kind of absolute national priority. On the other hand, NEPA and its progeny also do not automatically defer to ordinary foreign relations considerations, even when national security values are said to be implicated. The statutory language of NEPA, for example, does not carve out any explicit or automatic exemptions for foreign affairs or national security concerns. Occasionally, another subsequent statute has created an ad hoc exemption for a particular project, such as the Trans-Alaska Natural Gas Pipeline, when the legislature judged that compliance with the usual EIS procedures would be unduly burdensome or time-consuming. Occasionally, too, the Council on Environmental Quality (CEQ) has authorized individual waivers of the ordinary NEPA processes, as for accelerated military emergency activities in 1990 and 1991 in conjunction with Operations Desert Shield and Desert Storm. But in general, full EIS documentation and compliance with all the other trappings of American environmental law are required, even when that conformity threatens to delay, disrupt, or effectively preclude a commercially important enterprise or a project for which the federal government has a major responsibility and investment.

In a similar vein, CEQ and other agency regulations specify that no EIS documentation will be necessary where the agency's contemplated action is "mandatory," as where an international agreement imposes nondiscretionary obligations upon the United States and deprives the executive branch of any legal alternatives for executing those commitments. The language of those escape clauses, however, suggests little relief in the case of the CWC. That is, although the United States will be legally bound to destroy the CW stockpile, and accorded no options about effectuating that policy, the treaty does not specify any particular methodology for accomplishing the eliminations. Therefore, the government may still logically be required under domestic law to prepare environmental impact statements regarding the specific dismantling technologies and locations that it has voluntarily selected.

b. The States and the CWC

No state government would have a special interest in frustrating the effective implementation of the CWC, *per se*, but it is quite possible that a local community might weigh the balance between treaty compliance and environmental protection differently from the national leadership. Under the Constitution, national and international standards of the sort under consideration here would trump any contrary state and municipal provisions, and the national government is empowered to pre-empt an entire topic, by explicitly excluding state legislation, or by occupying the field with comprehensive federal law.

In fact, however, the strategy of much United States environmental law has been precisely the opposite: to establish minimum federal standards and procedures applicable nationwide, but also to allow the states to graft, on their own, more stringent provisions. Under the Clean Air, Clean Water, RCRA and other programs, private or governmental entities that wish to engage in the regulated behaviors are required to conform to both the federal and the state constraints. While it may seem odd for the national government to have ceded such authority to the states, as it is inconsistent with the notion that ecological effects are interconnected nationally and internationally, and are not matters of strictly local concern, that type of delegation has been the recurrent pattern. The national government, of course, is empowered to alter that balance of power--to retrieve more decisionmaking authority for itself via ordinary legislation or regulation--but that type of re-assertion of power ordinarily carries a political price, too.

Even more striking, the federal government itself has submitted to the jurisdiction and control of the state environmental agencies, reversing the usual federalist presumption that state governments cannot hamstring the national leadership. Via statute and executive order, the federal government is constrained to adhere to state substantive anti-pollution requirements to the same extent as a private person, across a wide range of activities, presumptively including facilities such as the Army's proposed CW incinerators. Again, the national government would be constitutionally empowered to shuck off those restrictions, but has not yet found it expedient to do so.

Thus, under existing law, the governors, state environmental protection agencies, and even local administrators are empowered to set the pace and to create the conditions and impediments for the Army's construction, dismantling, and inspection functions required under the CWC.

5. Options for Dismantling Chemical Weapons

a. Failed Alternatives

For many years, the United States and other countries have exercised, or at least contemplated, a variety of

CW disposal methods that are now widely viewed as foolish, impractical, or environmentally unacceptable. As noted above, substantial quantities of abandoned chemical munitions were simply buried, often in ordinary public or military landfills, with shockingly poor procedures for posting a hazard warning or permanently recording the activity. Ocean dumping has also been a popular expedient, especially for disposing of captured Nazi stockpiles immediately following World War II, and was pursued through the following decades, off the coasts of Alaska, California, and Florida. Too often, these lethal weapons were scuttled in shallow, turbulent waters such as the North Sea and the Baltic Sea, and ordnance still occasionally percolates to the surface in an unlucky fishing vessel's nets. Congress finally forbade United States ocean dumping of chemicals in 1972, and the Arms Control and Disarmament Agency has recently commissioned a report concerning the location and current status of ocean-dumped CW. Open pit burning of chemicals was also conducted as recently as twenty years ago, apparently oblivious to the hazards of the smoke plume and residuals.

More prudent methods of disposing of unwanted CW have included attempts to chemically neutralize the agents by forcing them through a series of chemical reactions that denature the toxins. The United States successfully destroyed armaments loaded with the nerve agent GB at Rocky Mountain Arsenal, Colorado during the middle 1970s in this way and more recently the United States has experimented with advanced neutralization programs at the Chemical Agent Munitions Disposal System (CAMDS) at Tooele, Utah. A total of over eight million pounds of chemical agent has been eliminated via this process. However, many experts have concluded that chemical neutralization (at least when attempted through the prior generations of chemical technology) was defective, in being slow, possibly reversible, incompletely successful in destroying all the active agent, and producing substantial quantities of toxic waste products which--while not suitable for weaponry applications--still required expensive and environmentally problematic further treatment or storage. Nonetheless, the concept of relying upon some form of chemical neutralization process to assist with the dismantling of chemical weapons is far from extinct.

More exotic disposal mechanisms have also been propounded. For example, it might be thought possible to place chemical weapons into a large, solid cavern deep underground and then detonate a nuclear weapon in their midst, vaporizing the CW stockpile with an appealing ``use a weapon to eliminate a weapon" irony. Some have even pondered the concept of loading the unwanted munitions onto a rocket and firing it into space.

6. International Ramifications

Each of these political machinations and technological options would be sufficiently difficult to resolve, even if the United States could proceed unilaterally with its CW elimination efforts inside a global vacuum. In fact, however, our CW-related choices and what we say about them will strongly influence and be influenced by events in other parts of the rapidly changing, politically malleable world community. This section considers some of the likely international factors that will interact with American policies about CW destruction and environmental protection.

The first important reality is that if the United States is unable to comply in a timely fashion with the disarmament obligations of the CWC, then the treaty itself will be profoundly jeopardized. Other countries will, understandably, be reluctant to submit to the expensive and cumbersome verification and confidence-building functions unless it is clear that the United States and Russia will continue the rapid movement toward elimination of their CW arsenals. American leadership is a sine qua non of global acceptance of the CWC, and although we can never rigorously quantify these diplomatic assessments, the treaty regime will be much stronger, and much more attractive to fence-sitting countries, if the United States disposes of its stockpile within ten, rather than fifteen, years. Although the treaty does contemplate a possible extension of time, its exercise is unlikely to be cost-free.

Second, any American hesitancy in discharging the disarmament obligations is likely to have special repercussions inside Russia, where the government faces even more severe environmental and fiscal challenges. For decades, the Soviet military establishment was allowed to despoil the national landscape in horrendous ways, and the scope of the required cleanup is immense. Ironically, the Russian (and all former Soviet) populace is only now becoming environmentally sensitized by the unraveling truth about the consequences of the Chernobyl disaster, as well as a host of other staggering pollution problems; now, that increased ``green consciousness" may translate into greater obstacles for the CW disposal effort. CW is merely one piece of a large, soiled fabric of Russian environmental issues; the list of ecological disasters awaiting emergency remediation is daunting, and the population will no longer blindly trust the government to ``do the right thing" on environmental and security issues.

7. Recommendations

Many observers will be sympathetic to both factions in this novel public policy debate, recognizing the importance of cleaning up the CW arsenal without further destroying the environment. And many observers will also be unwilling to surrender very much on either point, reluctant to sacrifice either the CWC and the urgency of exploiting what might be a fleeting ``window of opportunity" for the achievement of chemical disarmament, or the

host of hard-fought environmental priorities and standards that have finally worked their way into American law.

The most felicitous outcome, of course, would be a technological, economic, and political solution that allows all these values to be served simultaneously. While we should continue to hold out hope for—and to work assiduously toward—that nirvana, no one can be confident that it will prove to be fully attainable, or that it will appear within the time frame mandated by the treaty and within the financial cost structure that the range of treaty parties will be willing to bear. There is also the question, lurking in the background, of whether there are wider implications of the unraveling CWC drama: is this a precedent for any other arms control regimes that might be developed in the future, such as the nascent efforts to destroy at last the planet-jeopardizing stockpiles of nuclear and conventional weaponry? Even aside from the fields of disarmament and environmentalism, might other, more distant, areas of public policy also benefit from the attempt here to develop a simultaneous solution to two conflicting, pressing social and technical problems?

This Article recommends that the efforts to pursue both CW dismantling and environmental protection should now proceed via “bending” United States commitments and policies—in two different senses. First, some of our existing national priorities will have to be “bent” (to yield, to be stretched or twisted—but not quite to be broken) to accommodate competing concerns. Second, some of our national policy tools and implementing powers should be “bent,” in the sense of being harnessed and applied to a task, to exercise and effectuate a set of necessary compromises. This section sketches five such bending transformations.

a. Bend Existing Environmental Law

Timely and effective exercise of the disarmament and verification obligations of the CWC will require some relief from existing state and federal environmental statutes and regulations. The implementing legislation for the treaty (or perhaps some later enactment) should therefore specify that NEPA, the host of federal antipollution statutes, and the environmental laws of the several affected states shall be waived in certain respects, not to apply with their usual vigor to all aspects of the CWC construction, operation, and inspection functions.

These exceptions, however, should be crafted narrowly. For example, regarding the NEPA requirements, the Army and cooperating agencies should still be required to write all the relevant environmental impact statements for major federal actions and should still circulate them at the appropriate stages for widespread public information and comment. But the construction activity on the CW elimination facilities should be allowed to proceed independently, without being held up by endless delays in the EIS process. Similarly, the Army should be held to full compliance with the requirements to provide community awareness and emergency preparedness planning, but should not defer construction and procurement pending the completion of those documents and procedures.

In the same vein, the Army should be held to full compliance with reasonable substantive emissions ceilings incorporated into relevant federal and state antipollution standards, but states should not be allowed to veto the projects, and the timetable for state action in reviewing and granting the necessary permits should be expedited by federal law. For example, if a particular state is taking too long to evaluate and issue a required RCRA or Clean Air permit, the Army should be able to obtain a federal release in order to allow the activity (construction or testing, for example) to proceed as required. In addition, there should be a provision allowing expeditious waiver of applicable permit limitations where necessary to facilitate a fully effective on-site inspection under the treaty. The objective should be to allow the inspection to occur as required by the CWC, to ensure that it be completed as safely and cleanly as possible, and to report and remediate *ex post* whenever the relevant permit has been exceeded.

The Army should also be required to perform the elimination functions as cleanly and safely as possible, but timeliness should also be included as a fixed parameter. This means, for example, that to the extent incinerators continue to be used for CW destruction, the NRC recommendations regarding pollution abatement techniques for smoke stack emissions should be incorporated, even if they are costly and their ultimate contribution to a cleaner smoke plume is marginal. In a sense, if “something has to give” in balancing our competing social interests, the first constraint to loosen should be the budget—if necessary, we will spend somewhat more to accomplish the disarmament; then the details, especially the procedural and timeliness standards, of existing environmental law; and only last the international law obligations of the CWC.

A major function of environmental laws such as NEPA, of course, is to help the government make better, more informed decisions about potentially polluting activities, and these managerial measures should be fully effectuated and enhanced. The CWC, for example, would benefit from a complete legislative environmental impact statement. Even if the document arrives far later than the usual timetable, Congress and the public should be apprised of the full range of environmental consequences and the potential alternative methodologies and locations that might be available. Likewise, the Army should undertake more citizen outreach efforts, to attempt to inform a skeptical public and to provide affected communities the most current data on the range of possible activities and hazards. But there should be no veto or impediment of the CWC's obligations—the dismantling should proceed; the

inspectors should be allowed to enter, take samples, and conduct their inquiries; and all the other operational aspects of the treaty should be effectuated in a timely fashion, in pursuit of the enduring, overriding national policy of chemical disarmament.

b. Bend the CWC

At the same time, the arms control side of the equation cannot emerge unscathed from the conflict with environmental law. In particular, I recommend that the Army now abandon its plans to accomplish the complete destruction of the CW stockpile and non-stockpile materiel within the treaty's ten-year period through exclusive reliance upon the baseline incineration technology at the eight continental U.S. sites. Instead, I suggest a common sense compromise, taking advantage of existing resources and seeking out new opportunities, as follows: (1) proceed with testing and, if reasonable existing environmental standards can be met, operation of the JACADS-style incinerator at Tooele, Utah because that facility is simply too far along to abandon; (2) advance cautiously with the permit applications for only one additional incinerator, probably the Anniston, Alabama unit, which is the next furthest along in the convoluted chain of development, as a "standby" or fallback option, without now making an irrevocable commitment to constructing or operating it; (3) explore diverse alternative elimination technologies with vigor and rigor, and prove our sincerity in the search for better methodologies by prudent investment of substantial governmental research funds; and (4) to ensure that the CWC's ten-year timetable can be met, the Army should now begin making plans for undertaking a timely neutralization operation, to dewater the arsenal, denature and stabilize the components, and seek a more completely tolerable future environmental solution to the problem of ultimate destruction of the toxic materials.

It is important to recall that the treaty requires the parties to "destroy" their chemical weapons, but it does not specify incineration or any other technology; the goal is to preclude weaponization of the chemical substances, and that prophylaxis could be accomplished via means far short of complete eradication of the chemicals and all their residues. In the treaty's terms, "Destruction of chemical weapons" means a process by which chemicals are converted in an essentially irreversible way to a form unsuitable for production of chemical weapons, and which in an irreversible manner renders munitions and other devices unusable as such."

The substantive arms control interests would thus be amply satisfied if the United States were, in a reliable and verifiable fashion, to: (1) separate the lethal agent from the ordnance; (2) cut, crush, or puncture any operational delivery systems, such as shells, bombs, or mines; (3) chemically denature the toxic agents, so they were, although perhaps still terribly hazardous, no longer suitable for warfare purposes, such as by forcing an irreversible chemical reaction, adding impurities or otherwise; and (4) store the resulting toxic waste products, under international safeguards, pending the evolution of acceptable technologies for their complete incineration or other elimination.

This deferral of the ultimate eradication of the lethal chemicals will not be inexpensive. Any denaturing procedures would require new laboratories in which to develop and conduct the de-weaponization reactions, possibly expensive chemical inputs, and additional secure long-term, large-volume storage facilities. Handling the lethal agents more often than absolutely necessary will run additional environmental risks--some experts conclude that the "front-end processing" (the manipulation of the munitions prior to the incineration of the chemicals) is the most dangerous, unstable aspect of any dismantling operation, and under this recommended type of two-step scenario, we would have to undertake that preparatory handling activity twice.

Also, any chemical processing to eliminate the weapons capacity of the toxic agents would surely create a much larger overall quantity of hazardous wastes--a morass that would still be highly dangerous to the environment, exposed for an additional period of time to all manner of natural and human risk factors. In addition, it should be noted that neutralization processes are applicable for disposal of the agents alone; some other mechanism (incineration or an alternative) would still be required to consume, clean, or dispose of the shell casings, explosives, dunnage, etc.

But the drain-denature-and-store scenario does buy time. It allows military and civilian experts an additional opportunity to invent or adapt a more secure, environmentally-friendly destruction technique and still comply with the CWC's ten-year goal. By "punting" the problem into the future--hopefully only a short time into the future--we can create a breathing space within which to allow additional creativity and additional resources to come to bear upon the problem and still achieve the overarching disarmament objectives.

c. Bend "NIMBY"

The popular public anathema against undertaking any hazardous activities in any particular locale will also have to yield--the weapons are here, and we simply have to do something about them. In the case of the CW elimination function, this means making some hard political choices that might temporarily disadvantage one community in favor of other communities and the country as a whole--not an easy policy to implement in a democracy.

The rational thing to do at this point is to reverse the Army's 1988 decision to destroy the weapons on-site at all eight installations. At some of the locations, the quantity of stored CW is so small that on-site disposal is not cost-effective; removal under even very elaborate and painstaking transportation arrangements would be more sensible. At some sites, the weapons are housed so near a population center that the social dangers are too great. No matter how many precautions we build into the incineration or other elimination operations, it is still prudent to try to reduce the probability of mass human exposure. At some sites, grass roots organizations have been so successful at marshalling public opposition that it would be foolhardy to persist with the projected facility--even a massive public relations campaign might be insufficient to quell the dysfunctional popular antagonism. At some sites, the process of obtaining the appropriate permits and constructing the necessary facilities is already so far behind schedule that there are real questions about the Army's ability to achieve the local goals even under the best of circumstances--a late, slow start may prove fatal to a location's ability to make a timely contribution to the CWC.

I also recommend that at each location where an incinerator or other elimination facility will be built, the affected community should have the local option to decide whether the plant should be promptly dismantled by the Army at the conclusion of the CW campaign, or whether it should be converted for purposes of handling other types of municipal or industrial wastes in the future. Some localities may already have adequate waste disposal mechanisms, but others are still searching for alternatives and might consider retention of a small incinerator or other facility suitable for a niche in the economy. Different communities might therefore weigh the tradeoff between environment and jobs differently, and the new technologies to be created in the coming years might alter the balance of interests, too. In this circumstance, it should be a local choice.

8. Conclusion

This excursion into the intersecting worlds of disarmament and environmentalism has established, once again, that politics makes for strange--and rotating--bedfellows. Not long ago, arms controllers and environmentalists viewed each other as presumptive allies across a wide range of social issues. From their joint opposition to the deployment of the MX missile, to their concerted support for the negotiation of a comprehensive nuclear test ban treaty, the two factions have regularly been stalwart contributors to the same peace coalitions.

This situation presents what might be a classic formula for making a poor social decision, as we have: (1) a clash of scientific experts, who disagree profoundly on the maturity and risks of incineration technology; (2) a dearth of tested data regarding the feasibility of alternative technologies; (3) powerful, mobilized, and indignant social groups pressing their separate agendas on both sides of the political spectrum; (4) not much time available to make a decision due to the lengthy lead times associated with testing, licensing, and constructing any demolition facilities; (5) international pressures to set a viable precedent for other countries to follow; and (6) elements of law (treaty and statute) weighing on both sides of the scale. Where uncertainty, urgency, and importance lurk together, there may be little elbow room for compromise or wisdom.

The difficulty in reconciling arms control and environmentalism is magnified by the fact that there is no reliably safe course of action. Instead, all our policy options--even stagnant preservation of the status quo--involve some degree of risk to public health and security. I cannot assert that my recommendations are any safer than the Army's current disposal program; it involves, rather, the substitution of one set of imperfectly-known risks for another. Each of these dangers is difficult to identify and quantify on its own; when we have to trade off incommensurable hazards such as weapons proliferation vs. toxic waste, the calculation becomes intractably complex.

Public choice theory, in fact, would suggest profound, inherent constraints upon a society's ability to make intelligent decisions even under more favorable circumstances. The limitations upon any group's ability to wrap itself around complex, multi-dimensional options and to select among them in a determined, defensible fashion, are substantial. Fundamental legal tasks, such as passing a law or construing a statute, are surrounded by the indeterminacy of collaboration and sub-group politicking. These dilemmas multiply when the values at stake--environmentalism and disarmament--have the character of "public goods," the enjoyment of which is available even to noncooperating "free riders." As pluralism spreads around the world, the newly emerging democracies may suddenly confront the disabilities of undisciplined decision making; an authoritarian government might be able to enforce a one-sided choice between arms control and environmentalism via strong central control, but the United States, and increasing legions of other putative CWC parties, cannot.

The Chemical Weapons Convention, and the resulting social dilemmas surrounding the complete and permanent elimination of these horrid armaments, therefore pose a dramatic and irresistible problem for the United States and other countries. The best hope at this time is for some sort of just-barely-tolerable compromise, cobbling together the bare minimum conditions that arms controllers, environmentalists, budgeteers, and others would insist upon, in order to fashion a package that all elements might be able to live with. And with that technique, perhaps the implementation of the CWC may, in fact, be able to mimic at least a portion of the stunning, long-awaited successes

of the treaty's negotiation.

FOOTNOTES CHAPTER 10

¹ Margaret T. Okordudu-Fubara, *Oil in the Persian Gulf War: Legal Appraisal of An Environmental Warfare*, 23 ST. MARY'S L.J. 123, 142-45, 147-60 (1991). Copyright 1991. Reprinted by permission.

² Richard Falk, *Environmental Disruption by Military Means and International Law*, in *ENVIRONMENTAL WARFARE: A TECHNICAL, LEGAL, AND POLICY APPRAISAL 33-44* (A. Westing ed., 1984). Copyright 1984. Reprinted by permission.

³ ANTHONY D'AMATO, *The French Nuclear Tests of 1966*, in *INTERNATIONAL LAW AND POLITICAL REALITY* 233-36, 242-46 (1995). The original essay appeared in 61 *American Journal of International Law* 66 (1967). Copyright 1995. Reprinted by permission.

⁴ The fact of the opposition of the Polynesian people to the French nuclear tests has already been mentioned; the question is whether they have interests cognizable under international law. Such interests, if they exist, could not be at the level of an independent member of the international community, since Polynesia is not a state. Yet if Polynesia is a potential state, then its incipient interests may carry some degree of persuasiveness in the international community. Even apart from this, the concept of partial sovereignty, see 1 Oppenheim, *International Law* 119-123 (Lauterpacht, 8th ed), viewed in a colonial situation affecting the rights of underdeveloped peoples, adds international legal force to the claims of the natives of Polynesia. Several facts buttress these positions of potential nationhood or partial sovereignty. First, the increasing tendency of peoples to break from the mother country and the rising international consensus against colonialism (Reflected in General Assembly Res. 1514 (XV) on the Granting of Independence to Colonial Countries and Peoples) demonstrate that, despite the outcome of the referendum of 1958, Polynesia may someday in the not-too-distant future become a state. Second, Polynesia has the geographic characteristics of a state and has long been regarded by the rest of the world as an integral area. Its territory is 50% larger than that of the state of Luxembourg and its population is 500% more numerous than Liechtenstein's. The people have a relatively homogenous racial and cultural background. Third, the islanders regard themselves as a nation, and have repeatedly demanded more of the rights of nationhood and self-determination through the large native political party, the Democratic Rally of Tahitian Populations. Their opposition to the French tests is typically couched in terms of self-determination. Fourth, France may be said to have recognized the possibility of independence in 1958, since the referendum gave to all of her colonies the option of independence. Fifth, an analysis of the results of the 1958 referendum shows that French Polynesia came closer to opting for independence than all the other French colonies exclusive of Guinea.

A different basis for arriving at an international recognition of Polynesian interests might be found in Article 73 of the United Nations Charter. If Polynesia were a "non-self-governing territory" under this article, then France would be under a duty to "recognize . . . that the interests of the inhabitants . . . are paramount" and to "ensure . . . their political, economic, social, and educational advancement, their just treatment, and their protection against abuses."

⁵ *Report of the United Nations Visiting Mission to Trust Territories in the Pacific* 1956, UN Trusteeship Council, Official Records, 18th Sess., Supp. No. 3 (T/1278), at 45, 26-28.

⁶ See Margolis, *The Hydrogen Bomb Experiments and International Law*, 64 *YALE LAW J.* 629 (1955); REIFF, *THE UNITED STATES AND THE TREATY LAW OF THE SEA* (1959); Taubenfeld, *Nuclear Testing and International Law*, 16 *SW. L.J.* 365 (1963).

⁷ 78 UN Treaty Series 278 (No. 1021).

⁸ For the various committee reports, see UN General Assembly, Official Records, Docs. Nos. A/3838, A/5216, and A/5814.

⁹ By Anthony D'Amato, written for this Anthology.

¹⁰ See the essay on France's prior nuclear tests in the South Pacific, this Anthology, p. 203, *supra*.

¹¹ Thomas L. Friedman, *The Bomb and the Boomerang*, N. Y. Times, Aug. 27, 1995, at § 4, at 15.

¹² David A. Koplow, *How Do We Get Rid of These Things?: Dismantling Excess Weapons While Protecting the Environment*, 89 *NW. U. L. REV.* 445, 445-46, 449-61, 467-71, 479-98, 509-17, 533-35, 543-53, 561-64 (1995). Copyright 1995. Reprinted by permission.

¹³ Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction, opened for signature Jan. 13, 1993, 32 *I.L.M.* 800. The CWC will enter into force 180 days after 65 countries have deposited an instrument of ratification, but no earlier than January 1995. *Id.* art. XXI, para. 1.

¹⁴ 42 U.S.C. §§ 4321-4370(a) (1988 & Supp. 1994) (codifying Pub. L. No. 91-190 et seq. (1970), as amended).