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## Articles

### The Box H Problem: A Justification For Unilateral International Coercion

Owen Donald Jones

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# The Box H Problem: A Justification For Unilateral International Coercion

Owen Donald Jones†

It is clear that developments in science and technology raise fundamental questions about the doctrines and institutional structures of the international legal system. The system attempts to operate according to the basic premise, from a previous era, that the nation-state is and ought to be legally supreme within its territorial domain — a premise increasingly obsolete, at least at the functional level.<sup>1</sup>

## I. Introduction

The accelerating pace and expanding scope of modern industrialization and technological development have created commensurately dynamic challenges for the international legal system. This article identifies and analyzes one such challenge, herein referred to as the “Box H problem,” that uniquely combines the three elements of irreversibility, universality, and time-lag between action and effect. This novel conjunction of variables renders past norms obsolete, leaves traditional decision-making processes inappropriate, and warrants new legal conclusions. The challenge obtains because such problems will first be recognized and understood, if at all, only in countries with superior scientific resources. While traditional international norms would encourage patience and multilateral cooperation, historical analysis suggests that measures to achieve action through cooperation alone will prove inherently cumbersome and inadequate as a means of addressing Box H problems; with respect to the three elements, delayed action is the functional equivalent of inaction and actively cultivates crises. In the end, such a circumstance may require unilateral action.

For a variety of reasons, multilateral international cooperation is extremely unlikely on issues of tremendous economic consequence when the costs of disassociation are not quickly exacted. Nevertheless, impor-

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1. Drawn from Livingston, *Science, Technology and International Law: Present Trends and Future Developments*, in 4 *THE FUTURE OF INTERNATIONAL LEGAL ORDER* 68, 118 (C. Black & R. Falk eds. 1972).

tant global neighbors rarely approve of result-oriented coercive intervention unless perceiving a consequent benefit. Unprecedented complexity may obscure this perception and thereby discourage effective unilateral action.

In order to explore the consequences and policy implications of this inefficiency, Part II of this article examines the nature of a threat incorporating the irreversibility, universality, and time-lag characteristics. Irreversibility/Reversibility refers to the practical possibility of reparation or compensation for such behavior. Universality/Particularity refers to whether the effects of injurious behavior are essentially global or local. Time-Lag/No Time-Lag addresses the time between an action and its ultimate damaging effect.<sup>2</sup> Through a hypothetical incorporating the three characteristics, the article goes on to examine the socio-political problems of scientifically comprehending and effectively handling such a threat. Though this hypothetical involves currently unresolved environmental issues, it is not a case study of an existing international circumstance, nor is it intended to draw connections to existing events. The emphasis throughout is on the type of potential threat, for which this hypothetical merely serves as a vehicle of analysis.<sup>3</sup>

Part III examines traditional responses to the hypothetical that are likely to accompany any Box H problem. It examines both theoretical and representative multilateral efforts within the subject of the hypothetical, and concomitant barriers to international cooperation, in order to determine whether existing geopolitical, social, and legal structures could permit effective response to the genre of Box H threats. Part III concludes that interventionist and coercive unilateral efforts may be both necessary and efficacious.

Part IV discusses the possible modalities of coercion that will compose an effective coercive strategy. Part V examines existing documentary and precedential legal and extra-legal justifications for the most coercive unilateral actions that may be necessary to address the hypothetical. These justifications illuminate the legality of any equivalent or lesser actions necessary to address any Box H problem. Expansions and reinterpretations of doctrine and policy necessary to allow such actions are then proposed. Part VI acknowledges the probable impact of unilateral coercion on existing international norms, while Part VII examines both the active

2. The Time-Lag element has no bearing on the time necessary to repair or compensate damage.

3. The assumptions employed and the concomitant actions and justifications explored derive from a worst-case scenario. In the same fashion as analogous hypotheticals animate much of a country's national defense policy, this method demarcates the theoretical moraines short of which actions are considered possible, and then evaluated for advisability.

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and appraising roles of non-governmental organizations, proposing criteria to be employed in the assessment and containment of unilateral coercion.<sup>4</sup>

Ordinarily, laws influence behavior, and behavioral norms influence the prescriptive process. This is particularly true in the international arena, where past behavior sometimes becomes the law.<sup>5</sup> Consequently, in order for a policy to begin to affect future behavior, one must ordinarily change both current behavior and law. To allow the effective unilateral action that the hypothetical necessitates, one must change both the behavior of the technologically relevant actor, herein the "technological actor," and the laws either inhibiting its action, or guiding the normative assessments of other relevant elites. Simply put, leaders of technologically advanced countries<sup>6</sup> must, at some point, address and act upon certain types of scientific knowledge that existing international legal norms fail to address. They must articulate national policies either accelerating substantive changes in the expectations of international elites or laying a foundation for potential technocratically motivated acts, even to the limits of extraterritorial coercive measures.<sup>7</sup> True, this is radical, dangerous, and susceptible to abuse. Yet it may be that the alternatives are worse.

4. "Coercion" is used here in its broadest sense, including all forms diplomatic, ideological, economic, and military. It will not refer merely to the military mode, with which it is most commonly associated.

5. See generally Reisman, *International Incidents: Introduction to a New Genre in the Study of International Law*, in INTERNATIONAL INCIDENTS: THE LAW THAT COUNTS IN WORLD POLITICS (W.M. Reisman & A. Willard eds. 1988) [hereinafter INTERNATIONAL INCIDENTS] as well as the essays collected therein. Professor Reisman complains that international lawyers tend to construe the legal universe from texts, rather than actual behavior and events. In his view, incidents both shape and reflect expectations, and are thus norm generators and norm indicators. One can learn, therefore, what is permissible by scrutinizing behavior. *Id.* at 5-7. See also Tunkin, *Remarks on the Juridical Nature of Customary Norms of International Law*, 49 CALIF L. REV. 419, 426 (1961); McDougal, Lasswell & Reisman, *The World Constitutive Process of Authoritative Decision* [hereinafter *Constitutive Process*], in INTERNATIONAL LAW ESSAYS: A SUPPLEMENT TO INTERNATIONAL LAW IN CONTEMPORARY PERSPECTIVE 191, 199-200 (M. McDougal & W.M. Reisman eds. 1981); Reisman, *A Theory of Law From a Policy Perspective*, in LAW AND POLICY 75 (D. Weisstub ed. 1976), wherein it is observed that "over time, effective acts are likely to be deemed lawful." *Id.* at 86. For a comprehensive overview of international law theory, including opposing views, see McDougal, Lasswell & Reisman, *Theories about International Law: Prologue to a Configurative Jurisprudence*, 8 VA. J. INT'L LAW 189 (1968) and the wealth of historical and contemporary sources cited therein.

6. Note that, in the current age, technology is the root of both superior access to knowledge and to international economic and military strength. As these two are strongly linked, there is little likelihood that a country with superior scientific knowledge would have no effective power. Nevertheless, this remains a distinct possibility, implicit in the analysis to follow.

7. This article does *not* broadly advocate the use of force. As a matter of logic, however, force is simply the most *extreme* form of coercion and analyzing it may usefully illuminate the relative appropriateness of less coercive measures. Less coercive measures are always preferable when both possible and effective.

## II. New Problems, Science, and Law: Box H — A Conjunction of Irreversibility, Universality, and Time-Lag

Traditional national and international mechanisms operate effectively to solve, contain, or at least intelligently address, a wide variety of problems that are themselves composed of various combinations of distinctive elements. This essay concerns a unique combination of elements for which the traditional mechanisms of international law are insufficient. For purposes of illustration, imagine a permutation of the two elements: *irreversibility* and *universality*, and their opposites (see Figure 1). This yields four possibilities:

- 1) Reversible/Particular,
- 2) Irreversible/Particular,
- 3) Reversible/Universal,
- 4) Irreversible/Universal.

Adding the third element, *time-lag*, yields a total of eight possible combinations of the three elements (see Figure 2):

|                 |            |             |
|-----------------|------------|-------------|
| A) Reversible   | Particular | No Time-Lag |
| B) Reversible   | Particular | Time-Lag    |
| C) Irreversible | Particular | No Time-Lag |
| D) Irreversible | Particular | Time-Lag    |
| E) Reversible   | Universal  | No Time-Lag |
| F) Reversible   | Universal  | Time-Lag    |
| G) Irreversible | Universal  | No Time-Lag |
| H) Irreversible | Universal  | Time-Lag    |

An example of A (*reversible and particular with no time-lag*) is a street riot. The effects are (primarily) local, and immediately realized. Police action, court proceedings, and efforts of insurance companies readily “reverse” the damage. An example of B (*reversible and particular with time-lag*) on the other hand, is any action breaching a contract that will result in further damages occurring after the time of the breach. These “consequential damages” cannot ordinarily be valued until time has passed. Box C of Figure 2 contemplates things which are *irreversible and particular with no time-lag*. Pond-filling construction resulting in the extinction of a uniquely local fish species (e.g., the snail darter) would be an example of this class. A problem that is *irreversible and particular with time-lag*, in Box D, might involve the use of a pesticide, such as DDT. Since concentrations of the poison increase in each of the ascending trophic levels, the extinction of a species of a uniquely local predator may result long after the use of the poison has ceased.

Conventional world wars are examples of Box E problems (*reversible and universal with no time-lag*). While the taking of life is itself irreversible, the immediate damage to economies, cities, roads, etc., is most cer-

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## PERMUTATIONS: IRREVERSIBILITY, UNIVERSALITY, AND TIME-LAG

Figure 1

|              | Particular                  | Universal                  |
|--------------|-----------------------------|----------------------------|
| Reversible   | Reversible/<br>Particular   | Reversible/<br>Universal   |
| Irreversible | Irreversible/<br>Particular | Irreversible/<br>Universal |



Figure 2

|                         | No Time-Lag |                                       | Time-Lag |  |
|-------------------------|-------------|---------------------------------------|----------|--|
| Reversible/Particular   | A           | Criminal<br>Disturbance               | B        | Breach and<br>Consequential<br>Damages |
| Irreversible/Particular | C           | Construction<br>Causing<br>Extinction | D        | Pesticides<br>Causing<br>Extinction    |
| Reversible/Universal    | E           | Conventional<br>World Wars            | F        | Trade or<br>Exchange Rate<br>Policy    |
| Irreversible/Universal  | G           | Nuclear<br>Holocaust                  | H        | ?                                      |

tainly reversible (as Japan has demonstrated). *F (reversible and universal with time-lag)* can be easily illustrated by any of a number of necessarily complex and far-reaching international economic agreements. In the Plaza Accord of 1985, for example, the seven leading industrial nations reached agreement to drive down the value of the dollar vis-a-vis other currencies in order to alleviate world trade imbalances.<sup>8</sup> The Accord had immediate global effects, yet the intended effects were not expected until later.<sup>9</sup> Such policies have proven to be reversible. Box G, representing problems *irreversible and universal with no time-lag*, can best be illustrated with an image of nuclear Armageddon.<sup>10</sup>

The problems mentioned thus far comprise a spectrum of complexity and import. Nevertheless, there are national and international institutions, including existing organizations, regimes and customary practices, that serve to repair or limit the actual or threatened damage. No such entities exist for Box H problems.

Box H problems, which are *irreversible and universal with time-lags* between a damaging action and the actual resultant damage, have been quite rare historically. There was a time, not long ago, when neither box G nor H problems existed. Box G, in which the damage quickly follows the action, is more easily grasped by the limited human imagination. It is precisely because Box H problems appear less immediate, less horrifying, and hence less compelling, that to our tremendous disadvantage we are unprepared to deal with them. Since they are likely to be difficult to address, due to the diffusion of their causes and effects beyond the familiar geographic and temporal limits of more common problems, identification, comprehension, and solution would require intensive scientific research. An extended analysis of a single hypothetical, therefore, will serve to address this genre of problem, and to illuminate the inadequacy of typical international processes attempting to confront such problems.

8. Chicago Tribune, Apr. 8, 1990, at D14, col. 1.

9. This is due to what economists refer to as the "J Curve Effect." The J Curve Effect results when a country's currency is devalued, thus reducing the price of exports and increasing the price of imports. Yet, the value of goods imported under fixed-price contracts entered into before the devaluation is measured in the devalued currency at the post-devaluation exchange rate. Paradoxically, then, the trade deficit gets worse before it gets better. As time passes, the volume of exports increases since the lower price tends to increase demand abroad. Conversely, the volume of imports decreases. This improved balance more than compensates for the initial effects as it moves the country toward a trade surplus. See R. DORNBUSCH & S. FISCHER, *MACROECONOMICS* 763-65 (4th ed. 1987); R. GORDON, *MACROECONOMICS*, 612-15 (3rd ed. 1984).

10. Although it can hardly be asserted that the nuclear threat has been defused by effective multilateralism, the perceived immediacy of potential harm inspired a collusive (and self-interested) effort by strong governments resulting in the Treaty Banning Nuclear Weapons Tests in the Atmosphere, in Outer Space and Under Water, Aug. 5, 1963, 14 U.S.T. 1313, T.I.A.S. No. 5433, 480 U.N.T.S. 43.

## The Box H Problem

### A. *The Box H Problem: A Hypothetical (Extrapolated from Global Warming and Deforestation)*

The "Box H problem," as defined above, will be explored with reference to a specific "Box H hypothetical," as defined in this section. The challenge presented by global warming and deforestation will be a useful tool for our exploration of Box H problems. In order to provide depth and a more realistic historical context for examination of the hypothetical, it will at times be necessary to expand the scope of the discussion to include the "subject of the hypothetical" (in this case, international environmental law history).

Assume, for the purposes of this study, that the connection between global warming and deforestation actually conforms to a worst-case scenario: that is, that massive deforestation is the principal cause of global warming, and that the three Box H elements inhere.<sup>11</sup>

Many scientists believe that unabated exacerbation of the greenhouse effect could lead to catastrophic increases in the temperature of the earth's atmosphere.<sup>12</sup> Rapid global climate change would, at the very least, raise sea levels, alter patterns of water availability, and affect agri-

11. Whether this is *in fact* a Box H problem remains to be determined, as several elements of the global warming cycle are somewhat disputed. See *infra* notes 12, 13, 15 and 19-28 for further information on the state of scientific understanding.

12. The system is sufficiently delicate that even small changes may have profound effects over time. The problem of temperature is not like a population problem. If there is not enough food, plague and starvation will reduce humankind to some non-zero number capable of sequestering resources and reproducing. Temperature, on the other hand, can directly eliminate food resources on several trophic levels, making the question one of existence rather than distribution. Nor is the problem of temperature like a nuclear problem. Although both have equally devastating potential, the bombs lie dormant until used, while temperature can creep incrementally and incessantly without relationship to our anthropocentric conceptions of "use." We can drive it unintentionally.

In 1983, the National Academy of Sciences estimated that a doubling of carbon dioxide concentrations over pre-industrial levels would cause global temperatures to rise 1.5 to 4.5 degrees Celsius. Shabecoff, *Haste of Global Warming Trend Opposed*, N.Y. Times, Oct. 21, 1983, at A1, col. 3. The World Meteorological Organization (WMO), the United Nations Environment Programme (UNEP), and the International Council of Scientific Unions (ICSU) reaffirmed these estimates. Such a climate change, they determined, would have significant implications for man and the environment.

culture and global ecosystems.<sup>13</sup> Over time, these changes might threaten survival itself.<sup>14</sup>

To lay the foundation for warming as the hypothetical Box H problem, it is necessary to briefly summarize some of the scientific complexities.<sup>15</sup> A primary cause of this warming appears to be increasing carbon levels in the air, since carbon dioxide (CO<sub>2</sub>) absorbs radiant heat. The so-called "greenhouse effect" occurs when energy, in the form of sunlight, passes through the atmosphere on the way to the earth's surface but is trapped by CO<sub>2</sub> and cannot, in the form of radiant heat, escape into the upper atmospheric strata where it would be dissipated.

Increased deforestation is a major cause of CO<sub>2</sub> level increases for several reasons.<sup>16</sup> First, deforestation by burning liberates significant amounts of the estimated 2000 billion tons of carbon currently locked in the biomass. Second and simultaneously, both burning and logging<sup>17</sup>

13. EPA, *THE POTENTIAL EFFECTS OF GLOBAL CLIMATE CHANGE ON THE UNITED STATES: DRAFT REPORT TO CONGRESS (EXECUTIVE SUMMARY) 1* (J. Smith & D. Tirpak eds. Oct. 1988) [hereinafter *DRAFT EXECUTIVE SUMMARY*].

The rising of the sea levels is due, primarily, to the expansion of warming seawater (which constitutes two-thirds of the planet's surface), and, eventually, to the melting of the vast polar icecaps. Weather patterns are driven entirely by differential heating at the equator and the poles and will change commensurately. Rainfall distribution, for example, could change dramatically, leaving now arable land desertous, and possibly decreasing global food production. (Note that land fertility is largely a function of prior vegetative growth, both in terms of nutrients, and vegetative soil retention. A newly hospitable regional climate may not, therefore, find fertile soil.)

14. Although our species has evolved within extremely narrow parameters of environmental conditions, we often ignore the fact that these conditions are remarkably rare, perhaps unique, in space. Our parochial conceptions, for example, of merely Arctic "cold" or Saharan "hot" would be better informed by findings of astronomy: the 850 degrees Fahrenheit surface of Venus, or the far-beyond-frozen dark sides of interstitial galactic rubble.

15. See generally S. SCHNEIDER, *GLOBAL WARMING: ARE WE ENTERING THE GREENHOUSE CENTURY?* (1989) [hereinafter *GLOBAL WARMING*]; Schneider, *The Greenhouse Effect: Science and Policy*, 243 *SCIENCE* 771 (1989); K. KONDRATYEV, *CLIMATE SHOCKS: NATURAL AND ANTHROPOGENIC 1-71* (1988); Slocum, *Major Climate Changes Likely, Say Scientists*, 83 *J. FORESTRY* 325 (1985); Woodwell, *Global Deforestation: Contribution to Atmospheric Carbon Dioxide*, 222 *SCIENCE* 1081 (1983); Woodwell, *The Carbon Dioxide Question*, 238 *SCI. AM.* 34 (1978); Woodwell, *Forests and Climate: Surprises in Store*, 29 *OCEANUS* 71 (1986/87); lecture by G. Woodwell, Yale University, (Nov. 8, 1988) (on file with author). These studies suggest a growing consensus among climatologists that the earth is warming, with variations of the specified consequences. The National Academy of Sciences recently stated that "[g]lobal environmental change may well be the most pressing international issue of the next century." *N.Y. Times*, Jan. 12, 1989, at A16, col. 1. The six warmest years in the last 130 have all been in the 1980s. The first part of 1988 was the warmest ever on record. *Global Warmth in 88 Is Found to Set a Record*, *N.Y. Times*, Feb. 4, 1989, at A1, col. 1.

16. The burning of fossil fuels also contributes 5.6 billion tons per year of carbon to the atmosphere.

17. Although deforestation might not appear as linked to technological development as, say, genetic engineering, much deforestation derives from problems of competing with or sustaining technological economies. Consider, for example, expanding international markets for wood products driven by technology-facilitated standards of living, the desire to pave market-servicing roads through forests, and increasingly mechanized logging techniques. Even defor-

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greatly reduce the absolute numbers of photosynthetic plants which themselves extract carbon from the air through biotic exchange. Third, this very warming increases the rate of decay of the biomass, which further increases the escape of carbon from balanced vegetative cycles into the atmosphere. Thus an increase in carbon in the atmosphere produces warming which itself creates a surge of more carbon being released into the atmosphere from the biotic reserves.<sup>18</sup> This reciprocal effect is referred to as a positive feedback cycle.<sup>19</sup>

The three important elements of a Box H problem characterize this warming phenomenon. The first is its *universality*. Weather patterns observe no political boundaries. The second is *time-lag*. There is a significant delay between the contribution of a certain amount of atmospheric carbon and the directly commensurate temperature rise.<sup>20</sup> Over the last 100 years, for example, the amount of CO<sub>2</sub> has increased by 25-30%.<sup>21</sup> There is general agreement that this change has already, conservatively, committed the planet to a two to five degree Celsius average temperature increase by early in the next century.<sup>22</sup>

estation for farmland or pastures can be viewed as largely a product of technology-facilitated wealth disparities and the displacing expansion of urban areas.

18. Respiration itself is sensitive to a rise in temperature; decomposition increases dramatically. If the rate of decomposition exceeds the rate of photosynthesis, plant life recedes and perishes.

19. Another potential feedback system, which apparently would not begin until the Earth's temperature passes a certain threshold, is the melting of the icecaps. Since the icecaps are instrumental in reflecting light and heat away from the planet, their melting reduces their area and hence reflective capacity, resulting in still further warming of the planet and accelerated melting of the icecaps.

For more information on complex positive and negative feedback systems, see GLOBAL WARMING, *supra* note 15, at 46-49; Stone, *Feedbacks Between Dynamical Heat Fluxes and Temperature Structure in the Atmosphere*, in CLIMATE PROCESSES AND CLIMATE SENSITIVITY 6 (1984) [hereinafter CLIMATE PROCESSES]; Hartman, *On the Role of Global-Scale Waves in Ice-Albedo and Vegetation-Albedo Feedback*, in CLIMATE PROCESSES, *supra*, at 18; Hensen, *Climate Sensitivity: Analysis of Feedback Mechanisms*, in CLIMATE PROCESSES, *supra*, at 130; Lashof, *The Dynamic Greenhouse: Feedback Processes That May Influence Future Concentrations of Atmospheric Trace Gases and Climatic Change*, 14 CLIMATIC CHANGE 213, 238-39 (1989) (analyzing more than a dozen biological feedback processes and concluding they could, operating together, double sensitivity of climatic system).

20. See generally Harvey & Schneider, *Transient Climate Response to External Forcing on 10<sup>0</sup>-10<sup>4</sup> Year Time Scales, Part I: Experiments With Globally Averaged, Coupled, Atmosphere and Ocean Energy Balance Models*, 90 J. OF GEOPHYSICAL RES. 2191-205 (1985).

Significant, with respect to time-lag, is the fact of a large ocean carbon bank. The CO<sub>2</sub> pressure gradient between the atmosphere and the ocean seeks equilibrium (much as sealed soda, when opened, releases very concentrated gas to equalize the local amount of that gas in liquid and air). Because water both absorbs and releases dissolved gases more slowly than does air, a magic method of extracting carbon from the air would have to overcome a huge reserve of carbon that the ocean would continually rediffuse into the atmosphere as atmospheric extraction reversed the pressure gradient.

21. Woodwell, *Forests and Climate: Surprises in Store*, *supra* note 15, at 72.

22. This change is enormous when viewed in the proper time and space perspective. At the height of the ice age, when ice sheets over one kilometer thick covered all of Canada and

The third and critically important element of this phenomenon is that it may reach a point of *irreversibility*.<sup>23</sup> It simply may not be the case that the planet's temperature can always stabilize to a hospitable range.<sup>24</sup> This may produce an open-ended warming cycle. While irreversibility of the warming cycle is still a somewhat disputed issue, the irreversibility of many effects of warming is far less so. A report solicited by Congress states:

For natural ecosystems . . . these changes may continue for decades once the process of change is set into motion. As a result, the landscape of North America will change in ways that cannot be fully predicted. The ultimate effects will last for centuries and will be irreversible.<sup>25</sup>

The effects of such warming could be far greater than the unacquainted might suspect. If the temperature warms, they might argue, the crop belts will simply move northward, and Canada and the Soviet Union will be able to grow oranges. But the web of effects and the tremendous dependence of our economies on favorable environmental conditions<sup>26</sup> defies simplistic characterization. For example, while the climate for growing a certain crop may shift hundreds of miles, the soil there will not often replicate that needed for the crop's growth. Additionally, even if the soil were similar for a given plant species, those not actively planted may be incapable of migrating to other areas. In the 1800 years since the last ice age, for example, oak trees migrated northward in the United States as the ice sheet receded; temperatures warmed several degrees over

much of the northern United States, the temperature was only three to five degrees Celsius colder than it is today. GLOBAL WARMING, *supra* note 15, at 28.

23. Peter Usher, chief climatologist of the United Nations Environment Program, stated that although there is uncertainty as to how much of the weather patterns of recent years is attributable to global warming, there is no doubt that an irreversible process has already begun. *U.N. Scientists Again Warn of Global Warming*, U.P.I., June 3, 1989; *Scientist Says Effects of Global Warming Could Be Irreversible*, Reuters, Dec. 6, 1988.

24. See generally Hansen, *Climate Response Times: Dependence on Climate Sensitivity and Ocean Mixing*, 229 *SCIENCE* 857 (1985); Hansen & Lebedeff, *Global Trends of Measured Surface Air Temperatures*, 92 *J. OF GEOPHYSICAL RES.* 13345-372 (1987) (as updated by *Global Surface Air Temperatures Update Through 1987*, 15 *GEOPHYSICAL RES. LETTERS* 323-26 (1988)); *CLIMATE PROCESSES*, *supra* note 19; J. PENNER, UNITED STATES ENVIRONMENTAL PROTECTION AGENCY PROJECT REPORT AND SUMMARY: CLIMATE CHANGE AND ITS INTERACTIONS WITH AIR CHEMISTRY: PERSPECTIVES AND RESEARCH NEEDS (1988); and articles collected in 15 *E.P.A. J.* (Jan./Feb. 1989).

25. DRAFT EXECUTIVE SUMMARY, *supra* note 13, at 7. See also *Global Warming: Making Policy Amid Uncertainty*, Boston Globe, Feb. 12, 1990, at 33 (49 Nobel laureates and 700 members of the National Academy of Sciences appealed to President Bush, stating that "[t]he severity and rate of climate change . . . could be substantial and irreversible on a time scale of centuries.").

26. We depend on such conditions, for example, to provide sufficient regional drinking water and hydroelectric power, to maintain water levels stable enough to keep major cities above water, to prevent fertile fishing areas from moving elsewhere, and to allow food production on several trophic levels.

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thousands of years. Various models of warming-induced changes, however, currently predict that climatic zones may shift hundreds of miles in a single century; the rate of change is dangerous, even independent of its magnitude. Such unprecedentedly swift disruption clearly would have enormous ramifications not only in terms of irreversible species extinction, but also in terms, for example, of such conditions as dried and wind-scattered topsoil and hopelessly salinated farmland submerged by encroaching seawater.<sup>27</sup>

Employing the background assumptions that global warming is a Box H problem, that deforestation is its principal cause,<sup>28</sup> and that one country is the major deforester, let us now expand and clarify our hypothetical scenario:

- 1) Let us imagine ourselves leaders of the world's technologically superior country.
- 2) Due to remarkably sophisticated climatic models and analysis, we are the first country in the world to become possessed of the "facts" as above-related and convinced of their accuracy.
- 3) Recognizing that a threshold of irreversibility with respect to specific environmental damage is necessarily approaching, we send our most competent scientists from various disciplines to predict, within a relatively specific range, the probable date of threshold transgression (the abstract moment beyond which severely harmful warming is inevitable), if the current rate of a country's deforestation continues unabated.
- 4) In the meantime, we conscientiously implement serious modifications in our own domestic forest management policy, and use extensive and continuing diplomatic and ideological tools at our disposal to effect international environmental policy change . . . to no avail.
- 5) The scientists predict that there is a high (X%) probability of threshold transgression within Y time.

27. The Science Advisory Board to the EPA stated that "[i]n the Subcommittee's judgment, there is a broad scientific consensus on the type of climate change that could occur from alteration of the composition of the atmosphere." REVIEW OF THE REPORT TO CONGRESS: THE POTENTIAL EFFECTS OF GLOBAL CLIMATE CHANGE ON THE UNITED STATES, Feb. 14, 1989, at 3-4. The Board stated that the scientific community had far less confidence in the regional impact predictions than in the predictions for aggregate global warming. *Id.* at 4. The accuracy of the incredibly complex climatic models (measured, in part, by their ability to generate retroactive predictions that conform to past and current data) is improving. See *With Cloudy Crystal Balls, Scientists Race to Assess Global Warming*, N.Y. Times, Feb. 7, 1989, at C1, col. 1; GLOBAL WARMING, *supra* note 15, at 78-119. But see *Scientists Dispute Global Warming Theory*, Boston Globe, June 7, 1989, at 20, col. 3; *Global Warming Requires More Study Before Action, Experts Say*, Chicago Tribune, June 8, 1989, at 29; *Pseudo-Scientific Hot Air: The Data on Climate are Inconclusive*, N.Y. Times, Dec. 28, 1988, at A27, col. 1.

28. In reality, it appears that deforestation is only one cause of warming, since emissions from the burning of fossil fuels seem to account for the majority of released carbon dioxide. See generally *The Environment Survey*, a separate inclusion in THE ECONOMIST, Sept. 2, 1989, at 13. This highlights the complexity of the "clean hands" problem as a potential barrier to a contributing country's effective transboundary action.

- 6) For a variety of reasons (elaborated below), no international agreement can quickly be reached with respect to the data or the theoretical model.
- 7) Imagine further that the target (or "transgressive") country is easily identifiable and controls vast and relatively unique forests. It either refuses to alter its current deforestation policy, or is insufficiently in control of its citizens who continue deforestation on their own.<sup>29</sup>

Certainly, as X approaches 100% or as Y approaches zero, our resolve to effect immediate change increases. Faced with the posited threat, what pattern of international norms confronts us? How will these norms affect our decisions, and what will we need to decide? In the final analysis the questions flow in three tiers, and one advances from one to the next only if an answer is negative, indicating violation of prevailing international norms:

*Who Will Act:*

Will effective action be multilateral?

*The Nature of the Act:*

If non-multilateral, will such action involve the cooperation of the target country?

*Justification, Consequence and Appraisal:*

- i) If an action must be non-multilateral and coercive, what variations of modalities of action are available?
- ii) If an action is non-multilateral and coercive, how can such an act be justified?
- iii) If non-multilateral and coercive, what consequences may ensue?
- iv) If non-multilateral and coercive, by what criteria may such actions be appraised or restrained in order to prevent unchecked oppression or expansionism?

The three elements (irreversibility, universality, and time-lag between action and effect) of the Box H threat, and the three tiers of decisional process it requires, reveal a significant problem: there is no demonstrated political mechanism for dealing swiftly and effectively with such complex situations, and no likelihood of achieving one in the near future. Ordinarily, until a crisis validates itself by catastrophe, the whole concern is an abstraction.<sup>30</sup> The problem is that here catastrophe, because of the sub-

29. Although reference will occasionally be made to Brazil for purposes of highlighting, for example, Third World general resistance to pressure from industrialized nations, an explication of any existing relations with Brazil would involve additional complications and is not necessary for this inquiry. Rather, the severable issue of deforestation's posited relationship to global warming is sufficiently close, and incorporates enough potential players, problems, and complexities, that it will valuably serve.

30. See generally R. FALK, THIS ENDANGERED PLANET: PROSPECTS AND PROPOSALS FOR HUMAN SURVIVAL (1971) [hereinafter THIS ENDANGERED PLANET]; O'Brien & Marchand, *Politics, Technology and Technology Assessment* [hereinafter *Politics, Technology and Technology Assessment*], in THE POLITICS OF TECHNOLOGY ASSESSMENT: INSTITUTIONS,

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stantial time-lag, occurs too late. Conceptually, an immediate cessation of the actual activities capable of transgressing the threshold of irreversibility is necessary at some moment just prior to the transgression. Since the transgression may occur long before its actual effects are manifested, action may need to precede consensus.

To put in proper context the inquiry into who will act, it is first necessary to examine further general characteristics underlying Box H developments.

### B. *The Relationship of Science and Society: Characteristics*

Before we can examine the possibilities for cooperation and multilateralism in the international forum in the context of Box H threats, it is necessary briefly to examine significant issues that permeate and fundamentally affect any analysis of the interrelation of science, technology, and society.<sup>31</sup> Ordinarily, scientific advancement precedes law, and this sequence is not problematic. In an age of rapidly increasing destructive capacity, however, law should not lag significantly behind the science which may both enhance destructive capabilities, and suggest methods of restraint.<sup>32</sup> One might fruitfully observe six qualities that characterize the relationship of science to society and pose significant problems in the endeavor to bring science to bear upon law. All of these are readily discernable in the domestic arena, and all of them can be expected to impede further effective progress in the intricate international arena.

The first characteristic is increasing complexity. Increasing sophistication of scientific inquiry leads to increasing specialization. Generalists like Leonardo Da Vinci and Benjamin Franklin have given way to career specialists in high temperature superconductivity or nuclear fusion. The generalists, faced with rapidly mounting accumulated knowledge in increasing numbers of narrow subspecialties, have not the time to become definitive authorities in several fields at once. Commensurate with this increasing sophistication, technology has become far more hidden and mysterious as we now observe not catapults but nuclear reactions, the

PROCESSES, AND POLICY DISPUTES 9-10 (D. O'Brien & D. Marchand eds. 1982) ("Governments typically respond to technological developments only after deleterious consequences have proved demonstrable and/or public attention and pressure has become so focused and intense as to force technology-policy issues on political agendas.").

31. See generally SCIENCE AND ITS PUBLIC: THE CHANGING RELATIONSHIP (G. Holton & W. Blanpied eds. 1976); SCIENCE, TECHNOLOGY AND SOCIETY: A CROSS DISCIPLINARY PERSPECTIVE (I. Spiegel-Rosing & D. Price eds. 1977) [hereinafter SCIENCE, TECHNOLOGY AND SOCIETY].

32. See generally TECHNOLOGY AND POLITICS (M. Kraft & N. Vig eds. 1988).

computer replacing the abacus, and medical treatments becoming increasingly mechanized and chemical-intensive.

This accelerating complexity has yielded a second and distinct problem in education and conceptualization. The most recent centuries have witnessed a somewhat artificial bifurcation and divorce of scientific inquiry from the humanities and political philosophy. For example, although there is increasing and available evidence that behavior has far more genetic components than previously thought, most academic studies of human behavior do not integrate an understanding of biology and evolution with the analysis of politics, economics, or sociology.<sup>33</sup> Though there have been some efforts at integration, none have had significant impact.<sup>34</sup> The understandable result of these two developments, skepticism, is a third barrier to comprehension and understanding. Since it is difficult to filter the flood of materials from disciplines in which one has not been trained, a certain amount of doubt fosters clarity, the reassessment of explanations, and possibly an increase in accuracy. On the other hand, continued skepticism compounded by the public's frequently indiscriminate authority-ascribing processes<sup>35</sup> may be dysfunctional and may impede the effort to bring science to bear on policy and law.<sup>36</sup> While some may appropriately assert that a scientist's individual preferences may create an inherently biased normative agenda that leads to biased results,<sup>37</sup> a society's continued resistance to certain scientific conclusions

33. R. MASTERS, *THE NATURE OF POLITICS* xi (1989). Historically many disciplines were embraced holistically. Plato's *REPUBLIC*, for example, spans mathematics, physics, chemistry, biology, philosophy, and politics. Aristotle, too, discussed biology and physics as well as politics and ethics.

34. See *SCIENCE, TECHNOLOGY AND SOCIETY*, *supra* note 31 (discussing attempts at such integration).

35. Commenting on this phenomenon, one scholar observed:

Unfortunately . . . doubt is sometimes voiced by high-ranking scientists and economists — rarely, however, among those whose work brings them closest to the evidence. But the general public and newsmen too often fail to discriminate among scientists. On a question of ecology, the subjective opinion of a Nobel laureate in high energy physics may command more attention and respect than the opposing judgment of a relatively unknown ecologist. The public is then led to conclude that the scientists disagree and, therefore, there is no basis for action. The fact that the *relevant* scientists may not disagree is lost upon those who do not really understand the issues or the actors — and frequently that includes most people.

L. CALDWELL, *IN DEFENSE OF EARTH: INTERNATIONAL PROTECTION OF THE BIOSPHERE* 228 (1972) (emphasis in original).

36. See J. WATKINS, *SCIENCE AND SCEPTICISM* (1984) (which attempts to fathom whether the best corroborated theory is necessarily the best theory).

37. See Fisch, *Psychology of Science*, in *SCIENCE, TECHNOLOGY AND SOCIETY*, *supra* note 31, at 277 (discussion of motives, attitudes, and values of scientists that affect orientation and expectancies of research and research analysis). See also M. BLISSET, *POLITICS IN SCIENCE* (1972) (arguing that scientists are essentially political in character, never neutral or disinterested). But see G. GILBERT & M. MULKAY, *OPENING PANDORA'S BOX: A SOCIOLOGICAL ANALYSIS OF SCIENTISTS' DISCOURSE* (1984) (as a sophisticated disagreement, in part, with

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will silhouette a different normative agenda, one that leads to a biased rejection of results.

In potentially dangerous combination with skepticism is a fourth characteristic, “the irreducible frailties of the human intellect.”<sup>38</sup> Paramount among these are a singular limit to imagination and a certain temporal myopia. Science, for instance, often concerns things far larger or far smaller than we consciously confront in our daily lives. Yet some major problems arise precisely in these realms with which we are less familiar. The hypothetical, for example, requires us to wrestle with greater time spans, volumes and quantities than most ever imagine.<sup>39</sup>

Think, for instance, of how difficult it would be, over breakfast’s juice, toast, and morning newspaper, to worry about a few degrees rise in temperature over the next few decades, or any other Box H problem. A few decades seems, at first, a long time. If our lifespans were merely quadrupled, to approximate that of numerous living species, it would certainly have a profound effect on our life strategies. As things are, we apparently expire far too quickly to care.<sup>40</sup> Humankind evidently prefers to believe in the myth of infinite resources and the unchanging permanence of earth and its human exploiters. Since we do not have as vivid an understanding of long-term interests as of the immediate sensory world, our species seems predisposed both to fail to recognize the costs of current actions, and to spread the true costs of its current lifestyle (and generated Box H problems) vertically, through time, to future generations.<sup>41</sup>

Blisset); Lakoff, *Scientists, Technologists and Political Power*, in SCIENCE, TECHNOLOGY AND SOCIETY, *supra* note 31, at 355, 373; Mulkay, *Sociology of the Scientific Research Community*, in SCIENCE, TECHNOLOGY AND SOCIETY, *supra* note 31, at 93. See S. TESH, HIDDEN ARGUMENTS: POLITICAL IDEOLOGY AND DISEASE PREVENTION POLICY (1988) (for a case-study of the “inextricable interrelationship between facts and values, both in the search for the causes of disease and in the process of developing the best preventive policy”).

38. *Politics, Technology, and Technology Assessment*, *supra* note 30, at 1, 2.

39. For example, what does five billion tons of carbon look like? Humans have consistently demonstrated a manifest inability to imagine zeros, both spatially and temporally. See generally J. PAULOS, INNUMERACY: MATHEMATICAL ILLITERACY AND ITS CONSEQUENCES (1988). This can create an intellectual Doppler effect, warping our sense of time even as we are experiencing it. This would be dramatically demonstrated if a railway track were to be constructed as a model of time from the origin of the earth until the present. If the distance between each tie represents 2,000,000 years, then there are 2300 ties in the track. If the ties are spaced at one meter apart, the second to last one was laid when manlike creatures first stood upright upon the earth. The history of man begins only a few centimeters back from the front end of the last tie, and modern history begins only a few millimeters back. Although the length of the entire track is more than two kilometers, our technological society goes back only 200 microns (0.2 millimeters), just the thickness of a grain of dust upon the last tie. G. ABELL, EXPLORATION OF THE UNIVERSE 287 (4th ed. 1982).

40. Cf. “In the long run, we’re all dead.” Attributed to J.M. Keynes.

41. Cf. Demsetz, *Toward a Theory of Property Rights*, 57 AM ECON. REV. 347 (1967) (discussing inefficiency of such generational cost-spreading and discussing theoretical brokers of future interests).

Yet even this may be related to a fifth, more fundamental problem: long-range planning may ordinarily be maladaptive. It is no secret, for instance, that institutionally mandated, frequent supplantation of leaders decreases an office holder's accountability for long-term policies, thereby effectively foreclosing the appropriation of resources for long-range planning.<sup>42</sup> Additionally and more ominously, it ultimately may be historically, economically, and biologically maladaptive for a society (or country) to divert resources of time, energy, and money into long-term planning, since resources devoted to planning are necessarily diverted from immediately practical behavior, leaving long-term planners at a competitive disadvantage.

While some people are overly skeptical, as mentioned earlier, others may be insufficiently so, leading to a sixth problem: unrealistic hopefulness. The semi-mystical nature of technology, perhaps coupled with a human propensity to believe in panaceas and shortcuts to success, occasionally produces an over-optimism that science and technology can in time solve all of the community's latent ills.<sup>43</sup> More broadly, scholars, politicians, and indeed most of society continue to expect that a particular problem will have a "technical" solution, one not demanding adaptation or adjustment of human values.<sup>44</sup> Despite these expectations, modernization has created problems that defy a simple technical solution. The Box H problem is one such problem, and it cannot be solved by new scientific inventions.<sup>45</sup>

Thoroughly mixing the foregoing six elements of complications and tension within the modern relationship of science and society produces a number of collateral effects. Recognition of the power of technology has

42. See, e.g., H. WILENSKY, *ORGANIZATIONAL INTELLIGENCE: KNOWLEDGE AND POLICY IN GOVERNMENT AND INDUSTRY* 87 (1967).

43. See, e.g., Weinberg, *Can Technology Replace Social Engineering?*, in *TECHNOLOGY AND MAN'S FUTURE* 29-39 (A. Teich ed. 1972).

44. See generally Hardin, *The Tragedy of the Commons*, 162 *SCIENCE* 1243 (1968).

Scientists themselves have cautioned against such an overconfident attitude. At the end of a scholarly work on nuclear war, for example, two authors restated this caution, commenting that "[i]t is our considered professional judgment that this dilemma has no technical solution. If the great powers continue to look for solutions in the area of science and technology only, the result will be to worsen the situation." Wiesner & York, *National Security and the Nuclear-Test Ban*, 211 *SCI. AM.* 27, 35 (1964), cited in Hardin, *supra*, at 1243.

Two prominent authors have argued that the population problem, for example, is of this class of problems without simple technical solutions. Hardin, *supra*, at 1246. Cf. *TECHNOLOGY AND INTERNATIONAL AFFAIRS* 4 (J. Syzliowicz ed. 1981) ("[There is] no such thing as a 'Technological Fix' for social problems (e.g. . . . population growth) because the very act of solving one problem inexorably and inevitably creates a range of new problems whose solutions are each as difficult as the original. What remains to be understood and assessed . . . is not the promise of science and technology, but rather how that promise can be implemented in a manner that genuinely promotes human welfare.").

45. See generally *TECHNOLOGY AND POLITICS*, *supra* note 32.

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led, for example, to fear as well as worship. The possibility of that power infiltrating the political process to an unacceptable extent has caused a number of authors and politicians to warn of the darker side of technology: nuclear evils and fundamentally horrific developments in chemical or genetic engineering.<sup>46</sup> This view raises the "specter of technocracy" and claims that science and technology must be carefully contained, since they impose their own imperatives that may displace traditional social values.<sup>47</sup> Such a view would tend to exclude appropriate, as well as inappropriate, scientific influence. Camouflaged at the other extreme are those who appear to include science in political processes, actually only annexing scientific authority to predetermined political goals. Industry leaders, military leaders and politicians benefit directly when employing technological rhetoric to capitalize on anxiety about international economic and military supremacy, subsequently stressing the importance and promise of bolstered research budgets.<sup>48</sup> Such an approach has often lead to gross misappropriation, misinterpretation, and disinformation of events in the world of science.<sup>49</sup>

Regardless of which approach is prevalent or popularized, the fact remains that it is from the political arena that scientific advancements will be quashed or implemented and from which research funds will dictate

46. *Politics, Technology, and Technology Assessment*, *supra* note 30, at 1. See also B. FARRINGTON, *SCIENCE AND POLITICS IN THE ANCIENT WORLD* (1966) (tracing obstacles of public ignorance and superstition to spread of a scientific outlook from Anaximander (c. 610 B.C.E.), and highlighting that public views are often a combination of superstition and politically intended deceit).

47. See, e.g., J. ELLUL, *THE TECHNOLOGICAL SOCIETY* (1967); R. LAPP, *THE NEW PRIESTHOOD: THE SCIENTIFIC ELITE AND USES OF POWER* 3 (1965) ("[W]e face the real danger of a layered society in which a scientist elite faction floats on top and dominates our policy making. The danger is that a new priesthood of scientists may usurp the traditional roles of democratic decisionmaking."); D. DICKSON, *THE NEW POLITICS OF SCIENCE* (1984); Lakoff, *supra* note 37.

48. See D. DICKSON, *supra* note 47, at 3-4. In the United States, for example, President Reagan's State of the Union address at the beginning of 1983 has been characterized as a "hymn of praise to the cornucopia of technological promise," and the 1984 presidential campaigns emphasized how technology policy could "reindustrialize" America. *Id.*

49. At times this has caused the public to be grossly misled. *Id.* at 261-306 (identifying numerous incidents in which American public may have been misled by political claims to "scientific support" for policies, procedures, goals, and expenditures, and providing insightful discussion regarding ideological and material roles of science).

One study has concluded that the circumstance of misleading the public is particularly prevalent when politicians misconstrue the role of scientists they have asked for advice, often preferring to frame information provided as legitimation of their own agenda rather than apolitical guidance. J. PRIMACK & F. VON HIPPEL, *ADVICE AND DISSSENT: SCIENTISTS IN THE POLITICAL ARENA* (1974). Some have suggested that there is an endemic conflict between scientists and politicians, since the latter tend to disfavor anything reducing their power over public perceptions of policy. Masters & Kantrowitz, *Scientific Adversary Procedures: The SDI Experiments at Dartmouth*, in *TECHNOLOGY AND POLITICS*, *supra* note 32, at 282.

the existence, priorities, and direction of current developments.<sup>50</sup> These "institutional constraints"<sup>51</sup> can operate as effective barriers to the convergence of knowledge and goals.<sup>52</sup>

Additionally, modern studies of the politics of technology assessment note with concern the "deep-rooted philosophical and normative disagreements" which, they conclude, lead to "fragmented . . . and pluralistic political institutions and processes," particularly in a democratic polity designed to diffuse power.<sup>53</sup> Consequently, the evaluation of technology's changing roles is disorganized, unfocused, and unalterably distracted by the ensuing political cacophony. Ironically, while many theorists conclude that such constraints preserve a society from the perceived threat of technocracy, their conclusions highlight the perhaps greater threat that, in the context of Box H problems, understandings of the scientific community may be isolated and not effectively implemented by policy-makers.<sup>54</sup>

Yet many of the characteristics and problems discussed thus far could be addressed by aggressive national policies. The final and most important characteristic of the relationship between science and society is the international knowledge gap.<sup>55</sup> One of the most imposing barriers to addressing a Box H problem is the fact that, on a larger level, the peoples of the globe comprise one vast society, separated and factionalized by such things as geography, culture, religion, and language. The levels of

50. See generally E. MESTHENE, *TECHNOLOGICAL CHANGE* (1970); *SCIENCE AND POLITICS* (V. Bogdanor ed. 1984); J. KATZ, *PRESIDENTIAL POLITICS AND SCIENCE POLICY* (1978); Lakoff, *supra* note 37, at 356; L. COLE, *POLITICS AND THE RESTRAINT OF SCIENCE* (1983).

51. W. LAMBRIGHT, *GOVERNING SCIENCE AND TECHNOLOGY* 85 (1976).

52. Political systems often reward and encourage short term goals and thus scientists frequently cannot compete for the ears of policy makers with the more pressing concerns of the constituency or corporate and industrial powers. See generally *GOVERNING SCIENCE AND TECHNOLOGY IN A DEMOCRACY* (M. Goggin ed. 1986) (containing essays on the fundamental problem of autonomy and accountability in rapidly advancing technology, and proposing coordination of government, university, industry, public, and scientific communities). But see *Politics, Technology and Technology Assessment*, *supra* note 30, at 3 ("Politics, like ethics, religion, and culture, represents only another arena that gives expression to technological imperatives.").

53. *Politics, Technology, and Technology Assessment*, *supra* note 30, at 6; *CONTROVERSY: POLITICS OF TECHNICAL DECISIONS* (D. Nelkin ed., 2d ed. 1984) (collection of case studies of disputes between science, public, and government factions in U.S. on issues such as nuclear waste disposal, automobile airbags, and fetal research).

54. See, e.g., Lakoff, *supra* note 37, at 371 (palliating fear of technocracy and concluding that "scientific or technological expertise is not likely to win for its possessors a decisive share in political power"); D. PRICE, *THE SCIENTIFIC ESTATE* (1965) (specter of technocracy unlikely given checks and balances in governmental systems; concluding that, due to technical complexities, governments need increasingly to integrate technical capacity into political process, with results, on balance, beneficial).

55. See Szyliowicz, *Technology, The Nation State: An Overview*, in *TECHNOLOGY AND INTERNATIONAL AFFAIRS*, *supra* note 44, at 1-39.

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achievement in science, and indeed the focus of scientific endeavors, are radically different among nations.<sup>56</sup> Some have suggested that the particular form of scientific argumentation and demonstration that Western scientists have developed is rooted in a highly particularistic Western society to such an extent that it creates a threshold of general acculturation that non-Westerners must cross before they can understand, replicate, and extend similar scientific theories and experimentations.<sup>57</sup> These differences in science are paramount to differences in language; lack of a common basis and focus obviate true communication of scientific research, methods, analysis, or conclusions. Thus the technological actor will encounter grave difficulty trying to transmit its information and convince the target country of the dire consequences attending its uninterrupted behavior. These differences in scientific development pose a major obstacle to overcoming problems incorporating time-lag phenomena.

These cultural, conceptual, and structural obstacles act as independently operating defense systems, inextricably linked in the protection of divergent and perhaps antiquated world views. Yet because of the approach of unprecedented potential juxtapositions of irreversibility, universality, and time-lag, we either need to transcend each of these limitations as a cooperative community, or to develop in a timely fashion a legal theory not prohibitive of properly motivated and effective unilateral acts.

### III. Cooperation: An Unrealistic and Unrealizable Hope

This section analyzes the relative potentials for multilateralism, plurilateralism, and unilateralism in the context of Box H threats.

56. Ninety percent of all current research is still conducted in only a few rich countries. *Id.* at 4. See also SCIENCE, TECHNOLOGY AND GLOBAL PROBLEMS: VIEWS FROM THE DEVELOPING WORLD 53-60 (S. Radhakrishna ed. 1979) (survey of data regarding scientific institutions and publications in developing countries); SCIENCE, TECHNOLOGY AND ECONOMIC GROWTH IN DEVELOPING COUNTRIES (G. Skorov ed., J. Warren trans. 1978) (essays examining science expenditures in developing countries, and barriers to scientific and technological progress consequent to inequities of distribution); R. CLARKE, SCIENCE AND TECHNOLOGY IN WORLD DEVELOPMENT (1985); SCIENCE, TECHNOLOGY AND DEVELOPMENT: THE POLITICAL ECONOMY OF TECHNICAL ADVANCE IN UNDERDEVELOPED COUNTRIES (C. Cooper ed. 1978).

57. See, e.g., F. NORTHROP, THE MEETING OF EAST AND WEST: AN INQUIRY CONCERNING WORLD UNDERSTANDING (1946); Northrop, *The Complementary Emphases of Eastern Intuitive and Western Scientific Philosophy*, in PHILOSOPHY: EAST AND WEST 168 (C. Moore ed. 1944).

### A. *Multilateralism: The Impossible*

Minimally effective multilateralism can and has been achieved as the General Agreement on Tariffs and Trade (GATT),<sup>58</sup> the Universal Copyright Convention,<sup>59</sup> the 1980 United Nations Convention on Contracts for the International Sale of Goods,<sup>60</sup> the New York Convention on the Recognition and Enforcement of Foreign Arbitral Awards,<sup>61</sup> and a host of other multilateral agreements all indicate. Yet, assuming that the technological actor is convinced of a causal relationship between the transgressive country<sup>62</sup> and the approaching crisis, is cooperative action of many international players feasible for Box H problems?

In continuing our inquiry, we can usefully examine historical multilateral theory and actual practice in those areas of international relations that serve as background for our extended hypothetical. More specifically, we can evaluate the nature and probable success of multilateralism in general by examining actual and related representative multilateral events and efforts, and extrapolating these to likely Box H international responses.

#### 1. *Theory of Multilateralism, as Applied to the Subject of the Hypothetical*

Writers on global ecology, as recently as the 1970s, exhibited a firm belief in the efficacy of international efforts. Their writings focused primarily on "buying time" until intergovernmental regimes could achieve a world order system. All that needed to be done, they argued, was to rearrange international economic structures and achieve identity of interests among nations by equalizing both access to knowledge and living standards. In 1975, Professor Falk stated: "In the immediate period ahead one will probably have to concentrate on plugging holes in the ecological dike and hope that a movement for more ambitious varieties of global reform takes hold of the political imagination throughout the world."<sup>63</sup> This position can be characterized as "wait and hope." While the subsequent 15 years failed to achieve this ambitious reform, the rhet-

58. General Agreement on Tariffs and Trade, Oct. 30, 1947, 61 Stat. pts. 5-6, T.I.A.S. No. 1700, 55 U.N.T.S. 194.

59. Universal Copyright Convention, July 24, 1971, 25 U.S.T. 1341, T.I.A.S. No. 7868, 943 U.N.T.S. 178.

60. 1980 United Nations Convention on Contracts for the International Sale of Goods, U.N. Doc. A/CONF. 97/18, Annex I (1980), *reprinted in* 19 I.L.M. 671 (1980).

61. New York Convention on the Recognition and Enforcement of Foreign Arbitral Awards, June 10, 1958, 21 U.S.T. 2517, T.I.A.S. No. 6997, 330 U.N.T.S. 31.

62. As stated earlier, the analysis assumes that the transgressive country is a readily identifiable primary contributor to the problem.

63. Falk, *The Global Environment and International Law: Challenge and Response*, 23 U. KAN. L. REV. 385, 420 (1975) [hereinafter Falk, *Global Environment*].

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oric espousing the possibilities of effective and timely cooperation has proliferated. Some believe that although the concept of state sovereignty is pernicious in this context, when nations see their "interests and welfare protected by international action to an extent unattainable by their own [governments]," they will abandon "exaggerated interpretations of sovereignty."<sup>64</sup>

Some of these same writers conclude that there is simply no practical alternative to multilateralism, and that peaceful coexistence requires it. "In a world of nations, measures for the salvation of the world can be taken only by cooperative international action."<sup>65</sup> Such authors reason that since there is no possible agreement upon a single standard of equity with respect to the use of resources, compromise is necessary. They argue that we must "work as best we can within the existing system and with the various tools at hand."<sup>66</sup>

Given the unfortunate sterility of innumerable multilateral proposals in the field of the environment, though, it is curious that many, even those who believe in the unprecedented urgency of certain international environmental problems, argue only for cooperative, or institutional, models.<sup>67</sup> Yet have there been institutions sufficiently successful to suggest that such would exist to confront the unprecedented combination of the three elements of any Box H problem? Alternatively, are there any models, sufficiently successful within their intended purposes, to suggest that a new, and equally successful multilateral, institutional mode can be appropriately designed? Section 2 explores these questions, again by focusing on efforts concerning environmental threats, efforts which may be representative of successes or failures likely to accompany Box H problems.

64. L. CALDWELL, *supra* note 35, at 145.

65. *Id.* at 238.

66. Bilder, *International Law and Natural Resources Policies*, 20 NAT. RESOURCES J. 451, 485-87 (1980) [hereinafter *Law and Policies*]. Professor Falk, for example, elaborates an extensive cooperative system as the essence of his detailed proposals. R. FALK, *THIS ENDANGERED PLANET*, *supra* note 30. He has designed many innovative and sensible global organizations. He has even examined and accounted for many contingencies (except running out of time). Nevertheless, subsequent commentators must still conclude that "[n]o single body of doctrine yet has emerged which appropriately can be described as an 'international law of natural resources,' and it still is uncertain whether the many different types of natural resources and the diverse problems they encompass can be handled within a single framework of rules." *Law and Policies*, *supra*, at 452.

67. See, e.g., TIME, Jan. 2, 1989 (issue, entitled "Planet of the Year," includes dozens of such suggestions); L. CALDWELL, *supra* note 35, at 146 ("Assuming that the present ecological circumstances of humanity are unprecedented, it follows that unprecedented *institutional* innovations may be required to deal with them.") (emphasis added). The author admits, however, that "this line of reasoning is not as yet conceded by most people or their political leaders." *Id.*

## 2. *Practice*

What follows examines efforts to achieve multilateral cooperation and various barriers to such efforts that bear upon the posited hypothetical. From these we can infer that similar obstacles would confront any Box H problem. Obstacles to multilateralism explored below include: i) the necessity of agreement on problem and cause; ii) cultural and motive disparities; iii) no centralization of authority and power; iv) state sovereignty; v) domestic impotence; vi) the tragedy of the commons; and vii) time.

### a. *Representative Multilateral Efforts*

Concern for ecological problems surged and peaked rapidly in 1970-72<sup>68</sup> and then subsided, as the international community addressed shorter-term problems. On May 11, 1971, the U.N. Secretary General was presented with an appeal of 2200 scientists representing 23 countries warning of unprecedented environmental threats to mankind.<sup>69</sup> In 1972, the United Nations held the famous Stockholm Conference on the Human Environment.<sup>70</sup> The Conference participants devised an "Action Plan," which the General Assembly codified in December of 1972.<sup>71</sup> Included in the elaborate structure were details for coordination of boards, their composition and member terms, assignments, funds, etc., as well as recommendations to create INFOTERRA (an international environmental information system) and GEMS (a global environmental monitoring system).<sup>72</sup>

Commentators conclude that the Conference was either a great success for clarifying international policy, or a dismal failure because it demonstrated the extent to which governments will talk big and do nothing.<sup>73</sup> The latter view prevails. Ten years after the Stockholm Conference, in

68. For a partial yet extensive list of numerous multilateral conventions through the 60s and early 70s, see Livingston, *supra* note 1, at 96-102. See also E. HAAS, M. WILLIAMS & D. BABAI, *SCIENTISTS AND WORLD ORDER: THE USES OF TECHNICAL KNOWLEDGE IN INTERNATIONAL ORGANIZATIONS* 178-232 (1977) (studying what scientists involved in international organizations believe about relationship between specialized knowledge and collective action for achievement of economic, social, and political goals).

69. See Krotov, *Scientific and Technical Progress: The Environment and Man*, in *SCIENCE, TECHNOLOGY AND THE FUTURE* 423 (E. Velikhov, J. Gvishiani & S. Mikalinsky eds. 1980).

70. Report of the U.N. Conference on the Human Environment, June 16, 1972, U.N. Doc. A/Conf. 48/14 (1972), reprinted in 11 I.L.M. 1416 (1972).

71. The 1,200 delegates from 100 countries submitted over 100 specific recommendations. Smith, *The United Nations and The Environment: Sometimes a Great Notion?* 19 *TEX. INT'L L.J.* 335, 338 (1984).

72. *Id.* at 348-49. The boards eventually became the United Nations Environmental Programme (U.N.E.P.) with a staff of approximately 150 and a budget of \$30 million.

73. Falk, *Global Environment*, *supra* note 63, at 385.

1982, the Nairobi Declaration<sup>74</sup> (under the auspices of U.N.E.P.) candidly recognized that the Stockholm Action Plan failed due to the lack of foresight regarding the long-term necessity of environmental management, lack of coordinated and sustained effort, and continued inequitable distribution of resources.<sup>75</sup> Indeed, U.N.E.P.'s efforts have not achieved global currency. Consequently, many believe that the very heart of the U.N.E.P. Action Plan is so defective that the value of all other actions undertaken under its aegis are accordingly weakened and devalued.<sup>76</sup>

Any study of the subsequent history of multilateral endeavors reveals dozens of declarations and a morass of wistful rhetoric that suggests "strengthening" policies, advocates "broadening" programs and insists upon the "discovery" of cheaper and better solutions. One effort of the International Bar Association's Environmental Law Committee even encouraged participants to submit detailed responses on a hypothetical regarding environmental pollution.<sup>77</sup> In spite of this continued effort to promote multilateralism, with admittedly some success in raising consciousness, the environment continues to deteriorate at an accelerating rate.<sup>78</sup>

Five other representative cooperative efforts similarly demonstrate the failure of multilateral approaches. In 1979, 31 of the 34 members of the Economic Commission for Europe concluded the first multilateral agreement specifically addressing the problems of transboundary air pollution.<sup>79</sup> The agreement established no enforcement provisions.<sup>80</sup> In 1982 the United Nations produced the World Charter for Nature.<sup>81</sup> Provisions therein specified prohibitions against disrupting nature or the integrity of the ecosystem. It purported to impose international environmental impact statements<sup>82</sup> and concluded by stating that, "where potential ad-

74. U.N.E.P., Report of the Governing Council, 37 U.N. GAOR Supp. (No. 25) at 49 (Nairobi Declaration), U.N. Doc. A/37/25 (1982).

75. *Id.* at para. 2. Predictably, some of the major international contributors to the acid rain problem, which was to be addressed, chose not to attend the conference in Nairobi.

76. *See, e.g.,* Smith, *supra* note 71, at 349.

77. ENVIRONMENTAL POLLUTION AND INDIVIDUAL RIGHTS: AN INTERNATIONAL SYMPOSIUM (S. McCaffrey & R. Lutz eds. 1978).

78. *See*, U.N.E.P., The State of the World Environment 1972-1982, at 66, U.N. Doc. UNEP/GC(SSC)/INF.2, UNEP/GC.10/3 (1982).

79. An earlier effort had nestled a broad transboundary harm prohibition within a treaty on economic rights and duties. That provision ended with the hopelessly unhelpful statement that "all States should cooperate in evolving international norms and regulations in the field of the environment." U.N. Charter of Economic Rights and Duties of States, art. 30, G.A. Res. 3281 (XXIX), 29 U.N. GAOR Supp. (No. 31), 50 U.N. Doc. A/9631 (1975).

80. *See* Smith, *supra* note 71, at 355-56. The agreement also provided no numerical goals for pollution reduction or timetables for clean-up action.

81. G.A. Res. 7, 37 U.N. GAOR Supp. (No. 51) at 17, U.N. Doc. A/37/51 (1982). *See generally* Wood, *The United Nations World Charter for Nature: The Developing Nations' Initiative to Establish Protections for the Environment*, 12 *ECOLOGY L.Q.* 977 (1985).

82. G.A. Res. 7, *supra* note 81, at art. II(c).

verse effects are not fully understood, the activities should not proceed," and that "[n]atural resources shall not be wasted. . . ."83 Given the protean character of the terms employed, it is not surprising that there were no penalty provisions. Several years later, in 1984, Sweden attempted to strengthen the Environmental Modification Convention to no avail.<sup>84</sup>

In 1986 the Consolidated Report of the Experts Group on Environmental Law to the World Commission on Environment and Development submitted a twenty-two article proposal for "legal principles . . . to support environmental protection and sustainable development."<sup>85</sup> It encouraged information exchange and recommended, in article 1, that "all human beings have the fundamental right to an environment adequate for their health and well-being," and in article 2, that "states shall conserve and use the environment and natural resources for the benefit of present and future generations."<sup>86</sup> Nice. But no enforcement provisions were included.

Most recently, the Montreal Protocol on Substances that Deplete the Ozone Layer<sup>87</sup> has illustrated the pattern of failed multilateralism in the subject of our hypothetical. In order to reach consensus among a myriad of drafters, concessions had to be made that render the document of little more than symbolic value. For example, developing countries are allowed to delay compliance for 10 years in order to meet "basic domestic needs."<sup>88</sup> This term is conspicuously undefined, allowing essentially unreviewable discretion to the country claiming exception and delay. In addition, the Protocol contains no effective enforcement provisions.<sup>89</sup>

Moreover, if we look briefly at the archetypal multilateral adjudicative process, the International Court of Justice, we receive no assurance that that body is capable of adequately addressing the concerns of the hypothetical. The "resolution" of two disputes by the Court that relate to environmental issues, the Fisheries Jurisdiction Case<sup>90</sup> and the Nuclear

83. *Id.* at arts. 11(b) and 10.

84. See Westing, *Environmental Warfare*, 15 ENV'T L. L. 645, 658 (1985). Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques, May 18, 1977, 31 U.N. GAOR Res. Supp. (No. 27), U.N. Doc. a/31/27 [hereinafter EnMod Treaty].

85. Environmental Protection and Sustainable Development: Legal Principles and Recommendations, adopted by the Experts Group on Environmental Law of the World Commission on Environment and Development 7 (1986).

86. *Id.*, at 9.

87. U.N.E.P., Montreal Protocol on Substances that Deplete the Ozone Layer, Sept. 16, 1987, reprinted in 26 I.L.M. 1541 (1987).

88. *Id.* at arts. 1 and 5.

89. The express language of article 8, however, contemplates some miraculous future consensus on appropriate rules and tools of effective enforcement.

90. Fisheries Jurisdiction (U.K. v. Ice.), 1972 I.C.J. 12 (Interim Protection Order of Aug. 17); 1973 I.C.J. 3 (Jurisdiction of the Court of Feb. 2); 1974 I.C.J. 3 (Judgment of July 25).

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Test Cases,<sup>91</sup> were complicated in various phases by well-known and demonstrable failures of this multilateral adjudicative process, deriving from a lack of effective enforcement power.<sup>92</sup>

In light of the foregoing, it is a commonly held and accurate view that the international law of resources and pollution is yet in the "embryonic stage of development"; that is, "legal development in this area has not yet been evidenced by any growing acceptance of general principles of state responsibility for environmental injury beyond territorial limits."<sup>93</sup> The absence of international currency for such principles has significantly inhibited the growth of an institution capable of dealing with the challenges of the hypothetical in particular, and, by extension, Box H problems generally. More particularly, this brief look at unsuccessful attempts to achieve multilateralism in the broad subject of the hypothetical, when joined with the threat of our specifically posited hypothetical, suggests a number of deducible obstacles that may pervade attempts to combat any true Box H problem.

### b. *Barriers to International Multilateralism*

A number of problems are endemic to the effort to achieve effective international cooperation. The problems are exacerbated by, and should be examined in light of, the three Box H elements. For example, irreversibility suggests urgency and should encourage cooperation. Yet the knowledge gap leaves this effectively hidden. Universality should actually encourage cooperation. Yet, since there will be no initial agreement on the problem and cause of the scientifically identified threat, the fact that the problem will have universal consequences is hidden. Time-lag, the largest barrier, does not suggest urgency and does not compel cooperation since no one wants to sacrifice now for the sole benefit of someone else at some time in the future. Effective cooperation encounters obstacles not only in convincing elites of a real threat, but also in additional problems which would arise even were this formidable obstacle overcome.

91. *Nuclear Tests (Aus. v. Fr.)*, 1973 I.C.J. 99 (Interim Measures of June 22); 1974 I.C.J. 253 (Judgment of Dec. 20).

92. For criticism of the multilateral adjudicative process, see T. FRANCK, *JUDGING THE WORLD COURT* (1986). *But see* Falk, Book Review, 63 N.Y.U. L. REV. 1376 (1988) ("[T]his Review concludes that Franck's approach fails to recognize the necessity of international law of encouraging third party assessments of armed political conflicts and inhibiting illegal uses of force.").

93. J. BARROS & D. JOHNSTON, *THE INTERNATIONAL LAW OF POLLUTION* 74 (1974).

*i. Necessity of Agreement on Problem and Cause*

Unless relevant actors are convinced of the exact nature of the threat, cooperation is hopeless. Without the significant players at least recognizing where their best interests lie, symbiotic action in the areas of interest overlap is impossible.<sup>94</sup> It would be easy to achieve cooperation if there were recognition of a common enemy or threat.<sup>95</sup> Yet problems reside in disparities in ability to recognize threats, and the consequent lack of common recognizance and cooperation. The problems are compounded by the necessity of proving not only the existence of the threat, but its cause as well. This may not be easily conceded by relevant actors.

Efforts to convince, in any situation comparable to the hypothetical, necessitate scientific analysis. As discussed, the problem of bringing science to bear on the issues is enormously difficult in the domestic context, and nearly insurmountable in the international context. Significant technological knowledge disparities between nations,<sup>96</sup> and the lack of a collective experience, indicates that there will be no collective agreement regarding scientific data; few countries have the interest or means to verify independently, and even fewer countries would be willing to take on faith scientific conclusions offered by characteristically self-serving elite nations. Thus common interest, which is the precondition of cooperation, is masked. Moreover, even if, in the best of all possible worlds, the leaders of transgressive countries are convinced of the causal relationship between their actions and environmental damage, the subsequent attempt to agree upon the best method of combatting the cause is nevertheless rife with opportunities for conflict. Briefly consider the following.

*ii. Cultural and Motive Disparities*

The prevalence of cultural and motive disparities between and within nations increases intellectual and international viscosity. Since nations observe international legal norms only when the advantages of doing so outweigh the disadvantages, and since nations engage with each other in

94. This is the crippling fact that makes game theory models inapplicable.

95. This is known as the amity-enmity complex. See R. ARDREY, *THE TERRITORIAL IMPERATIVE: A PERSONAL INQUIRY INTO THE ANIMAL ORIGINS OF PROPERTY AND NATIONS* 269-319 (1966).

96. There is no doubt that relatively disenfranchised countries are increasing their access to scientifically trained personnel. Nevertheless, the available resources they can devote to research and training tend to be fairly limited. McDougal, Lasswell & Reisman, *The Intelligence Function and World Public Order*, 46 *TEMP. L.Q.* 365, 411 (1973) ("Large sections of the world must still be characterized as an enlightenment wilderness."). See also R. CLARKE, *supra* note 56, at 187 ("In the developing countries less than one person in 100,000 is a scientist. . . . [I]n most developing countries, what passes for a scientific community is still pitiful — a small group of dedicated and talented people constantly battling for financial support, without formal organizations, with scant access to the outside world of science, and often without even the means to travel to important international conferences.").

the prescriptive process along the ultimate vector of competing forces and interests, "they are obviously drawn together in association by common fears, values and interests," and "parted by suspicion, nationalism, acquisitiveness, fear, pride, aggression, and ignorance of each other's motives."<sup>97</sup>

Given the current international configuration of power concentrations, should the technological actor and transgressive country be industrial and Third World respectively, instead of vice versa, major issues of motive and fairness will ensue for any Box H problem.<sup>98</sup> In the subject of our hypothetical (the environment), the following statement by the Sri Lankan Ambassador to the United Nations is representative of the Third World perspective when faced with criticism from foreign sovereigns about its internal resource management.

[T]he governments of developing countries, their economies, and planners must not and will not allow themselves to be distracted from the imperatives of economic development and growth by the illusory dream of an atmosphere free from smoke or a landscape innocent of chimney stacks. We must not . . . allow our concern for the environment to develop into hysteria. We must see the problem in its proper perspective: physical, social, cultural, economic, political and aesthetic.<sup>99</sup>

Having watched the major industrial powers devastate their own environs, developing countries are justifiably resistant to the idea that they must now preserve, at the cost of their own development, that which others have destroyed.<sup>100</sup> This logic, although rational and justifiable, bodes poorly for cooperation in response to any Box H problem.

### iii. *No Centralization of Authority and Power*

The cultural, motive, and knowledge disparities between nations result in reciprocal distrust, and a consequent balkanization of authority.<sup>101</sup> Because of the diversity of the international community, the lack of central-

97. Smith, *supra* note 71, at 358.

98. See generally R. CLARKE, *supra* note 56; SCIENCE, TECHNOLOGY AND GLOBAL PROBLEMS, *supra* note 56.

99. Arvar, Thomas, Boksenbaum, & Soule, *The Pollution of Asia*, 13 ENV'T 10 (1971) (quoting Ambassador H.S. Amerasinghe).

100. As an example of this industrial/developing conflict, Brazil's foreign minister, Abreu Sodre, stated, "We cannot make the Amazon into some kind of national park for mankind. We must give highest priority to our own development." L.A. Times, Dec. 10, 1989, at M3, col. 4. "Brazilian officials have also argued that the industrialized nations have no right to criticize Brazil because they have destroyed so much of their own environment and are responsible for most of the world's pollution." N.Y. Times, Jan. 22, 1989, at A9, col. 1.

101. The problem of authority extends to all the attempts to constitute a truly representative prescriptive body. The problem derives from these facts: 1) whichever players decide upon the process of selection of experts or representatives will, themselves, be largely outcome-determinative; 2) because of this expectation, there still will not be universal perception of the group's authority once empaneled; and 3) the enormous ramifications of the panel's delibera-

ized authority results in a lack of cooperatively centralized power in the context of Box H threats.

In the subject of our hypothetical, for example, as long ago as 1970, U Thant, then U.N. Secretary General, stated: "If effective measures are to be taken in time, we need something new — and we need it speedily — a global authority with the support and agreement of governments. . . ."<sup>102</sup> Yet too many organizations and feeble attempts at multilateralism already clutter the international community. There are 5200 nongovernmental organizations (NGOs) registered with the Environment Liaison Office, a coordinating body conceived by NGOs at the Stockholm Conference of 1972 and designed to ensure liaison between the NGOs and the U.N.E.P.<sup>103</sup> There simply is no shortage of proposals, too numerous to string cite, all detailed yet dormant.<sup>104</sup> All contemplate multilateral support. None have grasped the minds of elites who could effect such proposals; thus, none are effectively significant. Many represent grandiose efforts that only establish future reviews of the situation and suggest upscaled efforts to encourage countries to try harder.<sup>105</sup> In addition, treaties that do or might exist are largely unenforceable; signatories to conventions are rarely in a position to enforce internal changes in another country.<sup>106</sup> Nor is the United Nations itself competent, as it lacks legislative power and its declarations are not binding.<sup>107</sup> The efficacy of law,

tions make members of the panel the likely object of powerful and potentially corrupting interests.

102. U Thant, *The Human Environment and World Order*, address of May 14, 1970, reprinted in 7 U.N. MONTHLY CHRON. 69 (June 1970).

103. U.N.E.P., *Introductory Report of the Executive Director, Addendum, Relationships with Non-Governmental Organizations*, at 1-8, para. 32, U.N. Doc. UNEP/GC.10/2Add.4 (1982).

104. An example of a considered and detailed, yet operatively ineffectual proposal is that offered by Caldwell in *IN DEFENSE OF EARTH*, *supra* note 35. This was written in 1972, at which time the author himself states that many of the proposals upon which he elaborates have been "under consideration" for a decade or more.

105. See generally J. BARROS & D. JOHNSTON, *supra* note 93.

106. Nor is it uncommon for countries to violate or "bend" treaties at will. See Koh, Nowak, Rees & Sofaer, *The Treaty Power*, 43 U. MIAMI L. REV. 101 (1988) (Professor Koh describes United States treaty history, and notes that United States is fleeing multilateral cooperation and international organizations, as evidenced by a) its modified acceptance of compulsory jurisdiction of International Court of Justice and b) its "reinterpretation" of the ABM Treaty to accommodate simultaneous development and testing of Strategic Defense Initiative). Any treaty to be enforced among a subgroup of signatories is susceptible to the same problem of enforcement. CALDWELL, *supra* note 35, at 110.

107. It has persuasive value, perhaps, but it is easily and legally disregarded. Its impotence is preordained: its constituent members are more committed to the promotion of each country than to the defense of all. Even (or perhaps especially) the Security Council, whose article 39 power is to make decisions concerning, or itself employing, appropriate uses of force, is completely handcuffed given the perennial opposition of certain constituent countries. Doran, *Can Nato Defend the Environment?*, 2 ENV'T'L AFF. 667 (1973) reaches a similar conclusion about NATO, largely because of its unanimity principle and the action-inhibiting ideological differences among members.

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and cooperation, is limited since the entire international configuration lacks effective central authority and includes states of vastly discrepant power.<sup>108</sup> This, too, bodes poorly for international cooperation in response to any Box H problem.

### iv. *State Sovereignty*

The problem of state sovereignty is correlated to the lack of centralized authority and power. It represents an additional hurdle to cooperative efforts. Once again, taking as our example the existing history of the subject of our hypothetical, we observe that "the principle of national sovereignty over resources generally has been held to mean that the nation having such sovereignty can deny all other nations access to or use of such resources. . . . A nation which needs another's resources can secure them only by convincing the second nation to supply them."<sup>109</sup> Sovereignty over natural resources is a concept defined by its proponents as an "inalienable right of each state to the full exercise of authority over its natural wealth and the correlative right to dispose of its resources fully and freely."<sup>110</sup> Such internationally anachronistic<sup>111</sup> concepts virtually ensure the ephemeral nature of cooperative commitments that might otherwise be likely to be effective in confronting Box H problems.

### v. *Domestic Impotence: The Problem of Vox Populi*

Any firm commitment emerging in the domestic arena to deal with Box H problems, such as the critical global environmental concerns of the hypothetical, is likely to be short-lived. As noted by Professor Harold D. Lasswell, who wrote widely on the behavior of political leaders, national leaders are "entrapped" by the expectations of their followers.<sup>112</sup> Thus, should sufficiently farsighted leaders be convinced of the present and future efficacy of cooperative prophylactic measures to combat Box H, they are virtually helpless to give continuing effect to any counsel of reasonableness that involves a drastic change in international, and hence economic, relations.<sup>113</sup> Unfortunately, people's awareness of what is ac-

108. See Schachter, *The Right of States to Use Armed Force*, 82 MICH. L. REV. 1620 (1984) [hereinafter Schachter, *Armed Force*].

109. *Law and Policies*, *supra* note 66, at 454-55.

110. See generally O. SCHACHTER, *SHARING THE WORLD'S RESOURCES* (1977) [hereinafter SCHACHTER, *RESOURCES*]. According to the N.Y. Times, Brazilian officials have made it clear that "Brazil would not permit its sovereignty to be threatened by a foreign role in protecting the Amazon." *Brazilians Tell of the Forest and the Fears*, N.Y. Times, Jan. 22, 1989, at A9, col. 1.

111. For an illustration, see the conclusion of Livingston, *supra* note 1, at 118.

112. See generally Lasswell, *The Social and Political Framework of War and Peace*, in 5 BRAIN FUNCTION: AGGRESSION AND DEFENSE 317 (1967).

113. *Id.*

tually in their self-interest frequently accrues diachronically and too slowly to be even minimally responsive to rapidly approaching threats.<sup>114</sup>

vi. *The Tragedy of The Commons*

As noted earlier, human groups are, perhaps to their own demise, incapable of adequately incorporating into their decisions and actions conceptions of distant people, countries, and future events when a threat appears neither massive nor immediate. International cooperation of the nature necessary to preserve something approximating climatic homeostasis, for example, is best modeled by what has been referred to as the "Tragedy of the Commons."<sup>115</sup> This applies to areas to which everyone has access but to which no one can lay exclusive claim (such as the "air"). A cooperative strategy optimizes outcome, but competition frequently obviates cooperation and results in over-exploitative strategies that operate inexorably to reduce aggregate benefits. Very simply, an actor who receives 100% of the benefits of her act, but pays only a fraction of the costs by bearing a tiny piece of the total damage of the act, will continue such action indefinitely.<sup>116</sup> This is true even if that action is to the extreme and future detriment of all. Analysis of where the damage is borne contemplates both a spreading of costs between existing countries (the horizontal dimension) and a transgenerational spreading (the vertical dimension). The model is directly applicable to the hypothetical, for example, since the target country receives all the short-term benefit of deforestation while it bears only its fractional part of the earth's warming, and only that which accrues within the lifetimes of its actors. This again is a circumstance likely to arise in any Box H problem.

vii. *Time*

Finally, and perhaps most likely totally to eclipse international efforts to combat Box H, is the exponential increase, over that of domestic conflicts, in the time necessary to overcome all of the obstacles to international incorporation of scientific knowledge and multilateral initiatives. Efforts to achieve effective multilateral arrangements always demand labyrinthine, long, and difficult negotiations, that often continue for years and are filled with potential snags and pitfalls.

The barriers confronting international cooperative endeavors, as illustrated and exemplified by scrutiny of such endeavors in the particular

114. Note, for example, how many years (and lives) expired before developed nations began to commit significant attention and resources to combatting AIDS, and how many people remain apathetic to possibilities of contracting it.

115. Hardin, *supra* note 44.

116. Assuming, of course, that the perceived total value of the benefit is greater than that fraction of the costs.

subject of our hypothetical, demonstrate what we might well consider the impossibility of achieving in sufficient time a consensus on methods to address Box H problems.

### B. *Plurilateralism: The Implausible But Preferable*

While consensus at a large group level is elusive, plurilateralism (coordinated efforts of a small number of governments) holds at least limited promise for Box H problems. The technological player need not, and economic and political costs suggest it should not, leap from the futility of large-scale cooperative efforts to aggressive unilateral ones. Nevertheless, when an alteration in a transgressing sovereign's internal policies or actions is desired, a small group of even significant countries is at a greater disadvantage to effect such a change than would be a large group. Furthermore, as one moves across the spectrum from supermajority to a mere plurality, one emerges from the grey zone of legality into the potential illegality of determined efforts to influence, which are by nature coercive, and which will be more critically recognized as such. It is important to note, however, that plurilateralism emphatically is not a midpoint on a spectrum of "acceptability" or perceived legality, with multilateralism at one end and unilateralism at the other. Plurilateral coercion is almost identical to unilateral coercion in that both are generally viewed as illegal.

Yet acting plurilaterally still preserves somewhat greater stability in the international arena than does unilateral action.<sup>117</sup> It still retains the distinct advantage of safety in numbers, appearing through some illusory analogy to democracy to be more justifiable to third parties. It sends less waves through the precedent-loving and over-bureaucratic governmental masses. For this reason, plurilateralism, if achievable, could arguably be more effective than unilateralism;<sup>118</sup> moral suasion will appear greater,

117. In a balkanized and competitive world, the balance of power tends to be delicate, and significant pressure by all parties exists to maintain maximum constancy in the rules of the game. The less powerful nations struggle to preserve maximum independence. The several most powerful nations vie for positions of influence. Saving face is important to all. Thus a somewhat unquantifiable backlash of unilateral coercive action insults the independence of the target and sets in motion forces to strip the other superpowers of face. In a world dominated by image, this alone may be sufficient incitement for levels of reprisal unacceptable to the would-be acting country. (Further checks on mere expansionism are discussed below.) By significantly raising the political and economic costs of coercion, this complex and interactive process may approach equilibrium with the cost of a Box H problem set in irreversible motion multiplied by the percentage of certainty, at least for the short run.

118. Minimum plurilateralism would be most effective if one, two, or several lead nations could achieve agreement on the potential onslaught of a Box H catastrophe. Such alignment is not completely inconceivable since the balance of military power has historically closely paralleled parity in scientific achievement. Ideally, close, regular, and personal communication between the science advisors of technologically elite countries, whether by teleconference,

and greater coercive power can be brought to bear through either diplomatic, economic, or military instruments. Thus, for example, it would always be a wise and practical idea for the technological actor to solicit agreement and aid from other significant countries. The countries of the Organization for Economic Cooperation and Development (OECD), or even the smaller European Economic Community (EEC), for example, could be an extremely powerful force if united.

Yet while plurilateralism is desirable, efforts to achieve it must still confront all the barriers to international cooperation outlined above. Thus it is still an open question to what extent plurilateralism could be achievable quickly, and whether it would be sufficiently responsive and successful in confronting the three elements of the genre of problem for which the posited hypothetical, involving global warming and deforestation, is an example.

### C. *Unilateralism: The Imperative?*

Multilateral endeavors, if attainable, unquestionably are preferable to unilateral acts, in the abstract.<sup>119</sup> But analysis of the subject of our hypothetical suggests that a multilateral approach is usually completely futile from a practical point of view.<sup>120</sup> Plurilateral measures, while more feasible to implement than multilateral ones, increase the possibility of effectiveness at the cost of decreasing the likelihood of global acceptance of coercive measures. The ultimate question is whether any sovereign ought to be allowed to continue behavior that threatens everyone's sur-

newsletter, or frequent summits, should be bolstered and institutionalized. Such discussion and familiarization would enable greatly expedited attempts at achieving agreement on a Box H problem and its cause. This may require the voluntary transfer of scientific data and techniques that may be marginal advances over that already in possession of another lead nation. The necessity of thus turning to another superpower for support not only increases the likelihood that ultimately effective action will be taken, but also operates as an appropriate and implicit inhibition on insufficiently justified action in the first place. Working with others operates to check illegitimate excuses for intervention by raising the political costs. *But see* D. Acevedo, *Collective Self-Defense and the Use of Regional or Subregional Authority as Justification for the Use of Force*, Paper delivered at the Proceedings of the 78th Annual Meeting of the American Society of International Law 69-74 (1984), (addressing, *inter alia*, *The United Nations Charter and the Use of Force: Is Article 2(4) Still Workable?*; the author condemns that grouping of states that may make the illegitimate seem legitimate).

119. *Cf.* Bilder, *The Role of Unilateral State Action in Preventing International Environmental Injury*, 14 *VAND. J. TRANSNAT'L L.* 51, 90 (1981) ("Multilateral approaches are intrinsically more desirable . . . because of their broad tendency to reinforce collaborative rather than competitive patterns of international behavior." This seems circular, yet unobjectionable.)

120. There are times "when multilateral approaches, as a practical matter, are likely to prove impossible to achieve or ineffective." *Id.* at 91.

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vival.<sup>121</sup> Shall we allow each sovereign state its own discretion in Box H matters unless inhibited by an improbable or ponderously achieved common understanding of a large group of relevant, but themselves competitive, actors? Perhaps these circumstances require the ordinarily anathematic unilateral action.<sup>122</sup>

Most emphatically, there is no significant and relevant precedent in modern times for a single superpower<sup>123</sup> exerting significant pressure, edicts, and control intentions upon countries that are not actively hostile in the traditional sense.<sup>124</sup> To explore the potential for the effective achievement of swift modification of a transgressive country's prevailing behavior, we could examine potential actions one by one beginning with the least radical and progressing as far as theory takes us, or we could examine a potential action maximally coercive and determine that if it is justifiable then all less coercive acts will be justified under its umbrella. This article takes the latter course.

Before examining this, however, it would be well to pause and consider the contextual development of actions taken before the employ of drastic measures. In reality, of course, ordinarily unjustifiable levels of coercion would be ill-advised as the opening bid of the technological actor. Since there are tremendous financial and political costs (both to the actor and to the target countries) proportional to the degree to which the inertia of the prevailing international norms is shaken by the actor's actions, it is preferable to effect the minimum disturbance necessary to achieve the requisite results. Recognizance of this will necessitate a spectrum of strategies moving from the less coercive to the more coercive.

### IV. The Strategy of Influence: Modalities

Assume that two thresholds of decision have been achieved: advisors of the technological actor agree in minimum material respects on the

121. Cf. R. ALEXANDER, *THE BIOLOGY OF MORAL SYSTEMS* 180 (1987) (discussing threatening behavior as seen by biologists and philosophers).

122. The efficacy of unilateral action as an example to be emulated, in either common territories (like the high seas) or domestic jurisdictions, has been addressed. Bilder, *supra* note 119. The Bilder article focuses almost entirely on domestic unilateral acts (in the form of either exemplary behavior or trade policy pressure on foreign states) and on unilateral acts affecting the global commons (such as an extension of the limit of territorial waters over which a state claims exclusive jurisdiction).

123. Though this paper intentionally includes the possibility that the technological actor need not necessarily be a superpower, it appears imperative for even minimum coerciveness that such an actor must align with a nation of demonstrable power.

124. While creditor nations have joined to manipulate debtor nations, this is distinguishable because there is a *quid pro quo*. This is not so in Box H. By definition, the current populace of the target country may not receive the direct benefits of any modification of its behavior.

nature of the threat, and a target country is isolated as a primary contributor to the problem (as confidently as, for instance, Japan can be linked to continued whale hunting). Given that the actor must exercise best judgment as to the maximum time allowable before changes must be achieved, what methods of influence are appropriate, and in what sequence or combinations?

If actions taken should be those that are minimally destructive or influential, yet capable of achieving the necessary behavior modification in a timely fashion, a pattern of influence must commence with minimally intrusive tactics. It is quite evident that the specific measures to employ are intensely issue-specific, and cannot be enumerated. Nevertheless, it is possible to examine the general characteristics of the family, if not the genus. These manifestations of the intent to persuade may consist of subtly distinct and innumerable combinations of modalities and intensities, and ultimately will be loosely measured for their aggregate, not individual, coercive pressure — that is, their cumulative insistence on a persuasion continuum that spans insignificant to irresistible. Though employed in strategic concert, the diplomatic, ideological, economic, and military modes may be discussed individually.<sup>125</sup>

#### A. *The Diplomatic*

The diplomatic effort begins with attempts to publicize the technological actor's understanding of the Box H problem and to solicit the attention, comments, agreement, and aid of any governments or non-governmental organizations (NGOs). The diplomatic channels extend from government to government and allow negotiations between the target country and the technological actor. Negotiations may include self-policing treaties concerning reductions in Box H-exacerbating behavior. They may involve manipulation of the privileges enjoyed by the ambassadors from the target countries, and a variety of maneuvers emphasizing the positive potential of cooperation and negative threat of economic and military manipulation and utilization. These might take the form, for example, of everything from ambassadorial insistence and personal confrontation to official communiques from the technological actor stressing intent to achieve change with or without cooperation. Nonrecognition, too, is an extremely important diplomatic weapon. The diplomatic vehi-

125. It is important to recognize at the outset that the four modes are overlapping, not coterminous, on a scale measuring degrees of coercion. Thus, high-level diplomatic action may have greater power of persuasion than low-level military action. See *Constitutive Process*, *supra* note 5, at 258.

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cle alone, however, is unlikely to be successful, but will prove valuable in laying the groundwork for justifying any later heightened coercion.

### B. *The Ideological*

The ideological effort is designed to extend directly from the organized plurality to the masses of the target country. The intention is to influence popular perspectives in the target country as well as in other states with direct appeals to the masses via television, radio broadcasts, newspapers, and rumors. Such propaganda is a particularly powerful force for eroding support of governments and encouraging behavior modification. It is, perhaps, so strong an influence precisely because it is a method easily overlooked.<sup>126</sup> A strategy employing versatile ideological influence targeted at both pressure groups and the populace at large may have considerable success at altering beliefs and attitudes which are obstacles to curtailing the injurious activities. Again, this tool may achieve limited success, but will likely need buttressing by other methods.

### C. *The Economic*

Constructive economic programs could involve sacrifice of receivables (perhaps in the form of "resource for debt-reduction" swaps), direct subsidies that accelerate common understanding of the problem (such as grants, services, and facilities for education and research), direct subsidies to aid governmental modification of people's behavior,<sup>127</sup> and ma-

126. Cross-border ideological influence can be sufficiently threatening to a government that it has been the subject of bilateral treaties, numerous discussions in the United Nations, and a number of draft conventions. See generally B. MURTY, PROPAGANDA AND WORLD PUBLIC ORDER: THE LEGAL REGULATION OF THE IDEOLOGICAL INSTRUMENT OF COERCION (1968); L. MARTIN, INTERNATIONAL PROPAGANDA (1958); PROPAGANDA: TOWARDS DISARMAMENT IN THE WAR OF WORDS (J. Whitton & A. Larson eds. 1963); *Constitutive Process*, supra note 5, at 262-64. The Charter of the Organization of American States recognizes this means of influence as potentially hostile intervention. Charter of the Organization of American States, arts. 15, 16, Apr. 30, 1948, 2 U.S.T. 2394, T.I.A.S. 2361, 119 U.N.T.S. 48.

As an example, the Convention Concerning the Use of Broadcasting in the Cause of Peace, arts. 1-3, Sept. 23, 1936, 186 L.N.T.S. 301, forbids signatories from broadcasting statements disruptive of the internal order of any contracting party, constituting an incitement to war, or harmful to "good international understanding" because of "statements of incorrectness." See also Falk, *On Regulating International Propaganda: A Plea for Moderate Aims*, 31 LAW & CONTEMP. PROBS. 622-34 (1986). A number of governments are currently finding the proliferation and availability of transborder video tapes, for example, particularly disturbing. Videos have been blamed from Kenya to Muslim countries to Viet Nam for a breakdown in the morals of youth and general degradation of religious and cultural values. The effect of video footage from the fronts has boosted morale of rebels in Burma and generated concern for the Mujahedin in Afghanistan. *Subversion by Cassette: The VCR Boom Spells Trouble for Authoritarian Regimes*, TIME, Sept. 11, 1989, at 80.

127. To illustrate, President Johnson offered vast sums of money and services to North Vietnam. *Johnson Hints at Aid for Asia if Strike Ends*, N.Y. Times, Mar. 26, 1965, at 1, col. 1; *President Offers to Start Vietnam Talks Unconditionally*, N.Y. Times, Apr. 8, 1965, at 1, col. 5.

nipulation of trade balances and currency exchange in favor of target countries. Such positive economic activity may also take the form of financial support for favorable political parties or insurgent groups and other organizations within target countries that are politically sympathetic and internally influential. Even outright bribery of powerful figures<sup>128</sup> is advisable if massive domestic changes are necessary to forestall a Box H problem. None of these, though, is likely to be continuously effective, as the target countries have an incentive to threaten to resume earlier behavior in order to extort increasing benefits from the technological actor. Moreover, such financial aid might cause indignation within the technological actor at having to compensate a target deemed culpable.

Because the statistical effects of the economy are more easily quantified and tabulated than are diplomatic or ideological gains and losses, it is possible to examine economic sanctions in somewhat greater detail. Economic sanctions<sup>129</sup> have been used in time of war, for political destabilization, on behalf of efforts to protect human rights, to halt nuclear proliferation, to settle expropriation claims, and to combat international terrorism.<sup>130</sup> But do they work? Even multilateral economic sanctions are commonly unsuccessful, and may be inappropriate as a Box H remedy.<sup>131</sup> The obstacles to successful imposition of economic sanctions are manifold. Initially, the decision to implement sanctions in the form of a prohibition of imports, license restrictions, a reduction of exports, curtailed extensions of credit, currency dilutions, product dumping, or some permutation of these is extraordinarily difficult. Even carefully formulated policies can create their own antidotes, actually

128. For a thoughtful and controversial view of the role of bribery in society, see W. M. REISMAN, *FOLDED LIES: BRIBERY, CRUSADES, AND REFORMS* (1979).

129. Article 41 of the U.N. Charter specifically allows that such sanctions may be appropriate: "The Security Council may decide what measures not involving the use of armed force are to be employed to give effect to its decisions, and it may call upon the Members of the United Nations to apply such measures. These may include complete or partial interruption of economic relations."

130. G. HUFBAUER & J. SCHOTT, *ECONOMIC SANCTIONS RECONSIDERED: HISTORY AND CURRENT POLICY* 6 (1985) [hereinafter G. HUFBAUER & J. SCHOTT, *ECONOMIC SANCTIONS RECONSIDERED*]. The book is a comprehensive and sophisticated analysis of 103 instances, since 1914, of economic sanctions for foreign policy purposes. The study was undertaken to inform the debate whether and how to use sanctions, and eloquently manifests their nearly universal failure. See also G. HUFBAUER & J. SCHOTT, *ECONOMIC SANCTIONS IN SUPPORT OF FOREIGN POLICY GOALS* (1983).

131. G. HUFBAUER & J. SCHOTT, *ECONOMIC SANCTIONS RECONSIDERED*, *supra* note 130, at 89.

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backlashing by unifying the target country and increasing its self-reliance.<sup>132</sup>

In most cases, the difficulties in successfully achieving changes in the policies of foreign governments result in more annoyance than hardship for the targeted state. While the overall success rate for simple, modest policy changes is barely 40%, according to two scholars,<sup>133</sup> the likelihood of any major policy change, such as the one necessary in a hypothetical Box H problem, is less than 20%. Consequently many commentators and politicians do not consider economic sanctions to be an "effective weapon of political warfare."<sup>134</sup> Thus, while they may have some effect over very short or very protracted periods, they should not be relied upon, alone, to produce necessary changes when problems of irreversibility, universality, and time-lag loom. Again, a multi-tool effort is necessary.

132. Countries party to the sanctions may maintain superficial adherence to the policies, but may, through public or private channels, leak goods to the target. Nonimposing countries may simply step in to replace the restricted supply, gaining trade profits and influence, and diluting the effects of the sanctions. Target countries themselves may actually experience medium-term economic gains by repudiating foreign debt, or, as Egypt and Cuba did, by simply expropriating assets of the imposing country. The country imposing sanctions may thus both directly and indirectly damage its own economy via lost business, assets, raw materials, export opportunities, and employment. Needless to say, this tends to undercut popular support. Minor sanctions are "virtually certain to produce reverse political effect without exerting any real pressure." R. RENWICK, *ECONOMIC SANCTIONS* 92 (1981). The more coercive sanctions self-inflict major damage. In addition, humanitarian concerns often reveal that sanctions most frequently injure the common citizens far more than the political elite. Though sanctions are, if at all, successful only over protracted periods, the problems enumerated are exacerbated over time, resulting in waning support in both domestic and international fora.

Historically, even concerted efforts such as those focused on Italy and Rhodesia have been largely ineffective. Efforts of 50 member states of the League of Nations, the first great economic sanction attempt, were unable to prevent Mussolini from conquering Abyssinia. *Id.* at 9-24. In the second grand attempt, beginning in 1965, fourteen years of sanctions were leveled against Rhodesia. For quite a number of years these actually yielded a benefit to Rhodesia; it simply defaulted on its debt, and was one of the world's boom economies in the early 1970s in spite of intensified sanctions. Throughout this period, Rhodesia needed only one major supplier, South Africa, to resist the pressure of sanctions. Consequent to the reciprocal effect of sanctions on commercial prices in the targeting states, the United States was the first formally to break the Rhodesian sanctions. *Id.* at 25-58.

133. G. HUFBAUER & J. SCHOTT, *ECONOMIC SANCTIONS RECONSIDERED*, *supra* note 130, at 82.

134. Friedman, *Economic Sanctions*, *NEWSWEEK*, Jan. 21, 1980, at 76; see also M. DAOUDI & M. DAJANI, *ECONOMIC SANCTIONS: IDEALS AND EXPERIENCE* 159 (1983) ("The history of sanctions has led some observers to conclude that sanctions are 'ineffective,' or at best 'symbolic'; on historical grounds, current social science tends to discredit the idea, dominant in the 1920s and 1930s, that sanctions constitute an effective coercive weapon in international politics."). *Id.* at 43-50, App. II; D. LOSMAN, *INTERNATIONAL ECONOMIC SANCTIONS* 128 (1979) (economic sanctions were "unsuccessful in each of the cases studied, despite target economies being relatively small and highly vulnerable").

#### D. *The Military*

The potential involvement of the military instrument spans the range of increasingly coercive participation. The effective use of the military may include all levels of muscle from harassment, disruption, or seizure of international vessels and air traffic, "gunboat diplomacy," covert operations and sabotage to assassination, invasion, and belligerent occupation. Given the high costs to all parties of military intervention, military action is justified only when the alternative is likely to be worse.

The technological actor should clearly explore these modalities, survey possible and specific objectives<sup>135</sup> and decide upon a strategy employing the least forceful means of international intervention. Though the evolving relationship between target and actor will require constant reassessment, the combinations of sequences and intensities employed should begin with measures minimally disruptive and proceed incrementally at a speed proportional to best estimates of available time, until they achieve a necessary stasis or reversal of deleterious behavior.

135. The logical and necessary complement to a discussion of modalities of influence is a discussion of objectives of influence; a proper strategy of influence requires both methods (as discussed above) and objectives. Having taken quick inventory of the tools available to the technological actor, toward what end should they be employed? Although a full examination of objectives is beyond the scope of this article, the following proposed taxonomic structure allows systematic identification and evaluation of all possible objectives. The structure identifies needs and preferences of the target and is intended to locate vulnerabilities.

The reification process here proposed separates the choice of objective into five separate decisions. To the Kingdom of international relations and the contextual Phylum of Box H problems, these five separate decisions provide the Class, Order, Family, Genus, and Species, the particular combination of which will positively identify a particular objective.

The first decision addresses the *Temporal Element*: on what stage of the various political and economic machinations of the target country will action focus? Since all behavior is intended to yield a benefit, the technological actor can disrupt the effort/reward cycle of the target country's behavior at either some time during Benefit Generation (actions intended to yield benefits) or during Benefit Realization (realization of those benefits). Second, the *Interaction Element*: will effective action target the principally Internal activities of a nation, or its External relationship with other countries? Third, the *Audience Element*: shall action target the Populace, or Governing Individuals in effective power? Fourth, the *Relatedness Element*: shall the coercion focus on the Particular activity or closely related behavior, or should the coercion focus on Unrelated activities? Fifth, and finally, the *Aiming Element*: shall action target Humans directly, or indirectly through their necessity and luxury Material Goods?

A moment's reflection will show that this T.I.A.R.A. construct, a categorizing circumscription of the decisional process, yields a range of 24 genotypic objectives from which the technological actor may choose. It describes logical possibilities without respect to the preferences that an applied value system will establish.

### V. Lawfulness: Extraterritorial Unilateral Coercion and the International Prescriptive Process

Concerned with the global community's perceptions, should the technological actor attempt to establish the legality of its actions, and if so, how? The decision whether or not to cloak the actions Box H problems may require in the trappings of legality is more complex than it at first appears. On the one hand, the technological actor may develop a sophisticated model tending to establish that its actions are legal within recognizable international law doctrines. This has the benefit of buttressing the conception that actors must recognize certain rules and limitations, without highlighting the actor's transgression of them. On the other hand, the technological actor may proclaim that its actions are most certainly illegal, but justified and necessary given the unprecedented and extreme threat of the Box H problem. This approach has the benefit of admitting that in dire circumstances rational people may ignore law, without warping traditional notions of legality. This has the marked disadvantages, however, of appearing hypocritical and confusingly unlawful, and of setting dangerous precedent as well.

The principal focus should be on the effect such justification, or its absence, will have on the expectations and future behavior of other global players, with particular attention to the benefits or disadvantages to accrue to the technological actor as a consequence thereof. Intuition and a concern for reputation suggest that, given a choice, one should try to appear law-abiding whenever it is not in one's overwhelming interest to act otherwise. Though this may sometimes require political gymnastics, a world of interdependents requires attention to international diplomatic and economic relationships, and the extent to which these may be undermined by flagrant transgressions of the international community's expectations.<sup>136</sup>

136. Thus, it is not at all quixotic to consider cloaking the actions in the garb of near-traditional legal concepts; though the fabric may need to be tugged and stretched, even abstract similarities to the familiar may palliate, subdue, or delay hostile international response. The proliferation of game theorists reflects the importance of ongoing interactions and the effect of today's behavior on the realization of predictable future desires. Nevertheless, this concern may plausibly lead to two quite different conclusions: while the technological actor's "new" interpretation of more traditional legal values may benefit it (or at least not damage it) in its direct interaction with other countries, it may receive greater indirect damage to its economic or political ambitions when other countries increase their internationally coercive behavior commensurate with the "newly" proclaimed legality. Thus attempting to establish a legal argument for one's coercive response to a Box H threat may warp, deform, and do irreparable violence to the international legal system. Attention to the costs of this eventuality are as important as they are difficult to compute.

Conversely, the costs of the alternative, reaffirming the traditional legal norms while claiming that unique circumstances justify their flagrant transgression, are relatively obvious, and the benefits are more subtle. These benefits, for example, must have motivated the extreme caution with which Israel and the United States handled the Israeli raid at Entebbe. The United States representatives in the U.N. Security Council shrewdly and emphatically pronounced the unending need to protect and sustain the ideals of "sovereignty" and "territorial integrity" of states and attempted to limit the precedential value of the act to the "exceptional" and "unique" circumstances of the situation, much as a judge might limit his opinion to only "the facts of this case."<sup>137</sup>

While the true nature of such an act is not as protean as its professed justification may be, the very process of asserting a justification necessarily reflects and reciprocally encourages the belief that justifications "matter" in some transcendent sense, and that the decisionmaking processes and behavior of countries are profoundly influenced by them. Maintenance of the myth that there is a congruence of the "legal" thing to do and the "right" thing to do provides a valuable normative circumscription of both domestic and international behavior. Yet sophisticated actors, in operation, self-consciously preserve a distinction between the legal and the right, acknowledging that certain acts are inherently dangerous and volatile but occasionally appropriate.<sup>138</sup> The statistical incidence of the appropriate occasion to break the law is deemed to be so low as to justify the existence of the rule excluding the act from legitimacy, while allowing that the sophisticated may transgress, and hoping and assuming that the sophisticated will be sufficiently cognizant of the potentially enormous ramifications of such an act that recognition may serve to inhibit the act and ensure that its occasion remains within acceptable limits. The acknowledgment of the act's illegality is in part an effort to reaffirm on the ideological level, and to reassure peripheral groups of, the continuing validity of the norm system just transgressed.<sup>139</sup>

The best one can conclude, taking as axiomatic that some justification is preferable to no justification, is that the decision to justify with legal or

137. J. MURPHY, LEGAL ASPECTS OF INTERNATIONAL TERRORISM: SUMMARY REPORT OF AN INTERNATIONAL CONFERENCE 20 (1978); LEGAL ASPECTS OF INTERNATIONAL TERRORISM 558 (A. Evans & J. Murphy eds. 1978). *But see* M. McDougal & W. M. Reisman, Letter, to the Editor of the N.Y. Times, reproduced in LEGAL ASPECTS OF INTERNATIONAL TERRORISM, *supra*, at 559-60 (arguing for bolder, self-vindicating approach).

138. On a more familiar level, we might prefer, for example, not to scrutinize *post hoc* the behavior of a police officer threatening an apprehended kidnapper in order to learn the location of a 14 year-old victim, and yet emphatically not wish to make threatening of arrestees legal. This tacit dualism is clearly reflected in the policy allowing prosecutorial discretion.

139. *See generally* REISMAN, FOLDED LIES, *supra* note 128.

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extra-legal arguments is not to be taken lightly. Nevertheless, there should be a rebuttable presumption in favor of legal arguments. First, since international relationships are shaped precisely by expectancies of reasonable and probable behavior, claiming to conform with legal theories (or not unreasonable extrapolations of them) is more likely to preserve and contribute to a methodic evolution of international order than if the contrary obtained. Second, and independently, the technological actor should prefer legal arguments whenever it has in the past criticized extra-legal justifications, or espoused the inherent virtue of the legal over the nonlegal. This is not because legality is ontologically superior to non-legality, but rather because in a world of interdependents and distrust, it more often than not will benefit a society to be consistent and to have rhetoric and behavior conform.<sup>140</sup> Both legal and extra-legal justifications are explored in the following sections.

Coercive unilateral action in the international arena may assume many forms: aggressive debt reclamation, nationalization/expropriation, military force or threat of force, varying levels of economic sanctions, physical quarantining, etc. Because this paper explores a worst-case scenario, a true Box H threat, it seeks the maximum action justifiable when recognizing the peculiar conjunction of irreversibility, universality, and time-lag. In such a case, both legal and extra-legal justifications may be available, as discussed herein.

One cannot impose the template of domestic law-making upon the international forum. Analogues to Congress, statutes, or court systems backed by executive power do not exist. Since an unenforceable "law" in the field of international law is merely an ideal, the question of lawfulness is reducible to "what are the expectations of what is right held by the politically relevant actors?"<sup>141</sup> International law, therefore, is found in previous acts as well as in multilateral agreements of various kinds.<sup>142</sup> Importantly, precedential acts and documentary guidelines may be inconsistent, confounding analysis.

A circular element thus inheres in the definitional process of international law. Law is, in part, custom.<sup>143</sup> This fact legitimates most of what

140. The contrary can be true, however, if a society has cultivated a reputation for being consistently and predictably contradictory in word and deed, or if other elites are regularly inconsistent.

141. See sources cited *supra* note 5.

142. *Id.*; see also Franck, *Who Killed Article 2(4)? or: Changing Norms Governing the Use of Force by States*, 64 AM. J. INT'L L. 809, 835-36 (1970) (according legislative role to practice of dominant states) [hereinafter Franck, *Who Killed Article 2(4)?*].

143. Statute of the International Court of Justice, art. 38(1)b, 59 Stat.1055, T.S. No. 993 (1945) (see *infra* note 157 for text).

has already been done, and consigns innovative action to an awkward conceptual hinterland where the opinions of world neighbors have not yet had cause to venture. Nonetheless, innovative action, if perpetrated without significant and tangible reprisal, may become part of the body of custom, largely as a function of continued international acquiescence or imitation and the passage of time.<sup>144</sup> The consequences of certain innovative actions may be assessed in terms of three sets of variables: 1) the participant's expectations of lawfulness prior to the incident; 2) the reactions of the international community to the incident; and 3) the impact of the incident upon previously identified norms.<sup>145</sup> Unfortunately, little data is available to guide the analysis of legality of an action such as the Box H problem requires. Nor can we turn for guidance to the subject of the hypothetical; as recently as a decade ago, concern about accountability for transfrontier environment-threatening behavior was focused either on intentional manipulation of the environment (environmental warfare), or on new "projects" that had significant environmental consequences. No significant focus on existing or future environmental damage as a by-product of certain human activities occurred. When it was considered, it was only in the context of valuation and compensation.<sup>146</sup> Thus, to learn more about possible justifications we must go beyond the norms bearing directly on the subject of the hypothetical.

#### A. *Legal Justifications*

##### 1. *Documentary Sources of Law*

Generally, reasonable democratic governments provide for swift executive action when consensus building and pre-action legitimation are impractical. This is no less necessary in the international arena. The most extreme action contemplated in the Box H context is injunctive, and, one hopes, retroactively justifiable, whether legally or not. An appropriate metaphor is the emergency brake on trains. Nonrepresentative individuals are allowed, in fact encouraged, to exercise their own subjective assessment of danger — even though there is a high possibility of unintended cost or harm. Presumably, the likelihood of being identified and the consequent imperative to justify the incident are sufficient deterrent to injudicious acts.

To examine the maximum action justifiable to confront Box H, we must begin at the end, by addressing the final state of affairs to which

144. See sources cited *supra* note 5.

145. Willard, *Incidents: An Essay in Method*, in INTERNATIONAL INCIDENTS, *supra* note 5, at 34.

146. See generally SCHACHTER, RESOURCES, *supra* note 110.

appropriate action may necessarily resolve: the use of force. Many commentators believe that broadly accepted international norms, whether in the United Nations Charter, the United Nations Declaration on Colonialism,<sup>147</sup> the United Nations Declarations on Non-Intervention,<sup>148</sup> or an extensive array of other international instruments and precedents, now clearly prohibit a nation from using force to acquire or prescribe the use of another nation's territory or resources.<sup>149</sup> In a world of power blocs and alliances, it is argued, practical political concerns and fears of escalation buttress those norms.

The United Nations Charter contains several relevant provisions. Many feel that, *prima facie*, the use of force in violation of Article 2(4) is clearly inconsistent with international law. Article 2(4) states:

All Members shall refrain in their international relations from the threat or use of force against *the territorial integrity or political independence* of any state, or in any other manner inconsistent with the *Purposes* of the United Nations.<sup>150</sup>

One of the stated "Purposes" of the United Nations is "[t]o maintain international peace and security, and to that end: to take effective *collective* measures for the prevention and removal of threats to the peace, and for the suppression of acts of *aggression* . . . in conformity with the *principles of justice and international law* . . . ."<sup>151</sup> Any of the coercive or injunctive actions arguably necessary in the context of the hypothetical herein elaborated would thus seem to violate Article 2(4); they are clearly intended to reduce the transgressive country's freedom to damage others by purely internal policies and actions, and thus to reduce its "political independence." Nevertheless, Article 2(4) is arguably inconsistent, and either the drafting or bright line interpretation is indicative of insufficient vision. By incorporating the "Purposes" of the United Nations, Article 2(4) implicitly and erroneously assumes that large-scale

147. Declaration on the Granting of Independence to Colonial Countries and Peoples, G.A. Res. 1514, 15 U.N. GAOR Supp. (No. 16) at 66, U.N. Doc. A/4684 (1960).

148. Declaration on Principles of International Law Concerning Friendly Relations and Cooperation Among States, G.A. Res. 2625, 25 U.N. GAOR Supp. (No. 28) at 121, U.N. Doc. A/8028 (1970); Declaration on Inadmissibility of Intervention, G.A. Res. 2131, 20 U.N. GAOR Supp. (No. 14) at 11, U.N. Doc. A/6014 (1965).

149. There is abundant material on what is and what is not "use of force," and in what circumstances it should be used. See generally *Restraints on the Unilateral Use of Force: A Colloquy*, 10 YALE J. INT'L L. 261 (1985) (essays of Falk, Gordon, Reisman, Rostow and Schachter); Schachter, *Armed Force*, *supra* note 108; Schachter, *In Defense of International Rules on the Use of Force*, 53 U. CHI. L. REV. 113 (1986); Franck, *Who Killed Article 2(4)?*, *supra* note 142; Henkin, *The Reports of the Death of Article 2(4) are Greatly Exaggerated*, 65 AM. J. INT'L L. 544 (1971).

150. U.N. CHARTER, art. 2, para. 4 (emphasis added).

151. *Id.* at art. 1, para. 1. (emphasis added).

collective measures are always possible when truly necessary and are superior to unilateral measures.<sup>152</sup>

Would actions taken for what the technological actor subjectively believes (as in the hypothetical) to be the preservation of both internal and global stability be acts of "aggression"? The definition of "aggression," as used in the "Purposes," was clarified in the U.N. Definition of Aggression Resolution of 1974<sup>153</sup> which states, essentially, that aggression constitutes "armed force" (or anything else the Security Council, pursuant to article 39 of the Charter, says that it means). Article 5(1) of the Resolution states: "No consideration of whatever nature, whether political, economic, military, or otherwise, may serve as a justification for aggression."<sup>154</sup> The problem for the hypothetical and other Box H crises is that while the actions would not be motivated by thoughts of conquest or complete domination, it is quite difficult to view them as viably within a traditional "self-defense" argument. A use of force as a response to the hypothetical problem certainly conforms to no current notion of defensive action, largely because the United Nations' parochial sense of self-defense tenaciously incorporates a dysfunctionally rigid requirement of hostility, immediacy of harm, and its emanation from a single source. The bright line, however, between "aggression" and defense fades quickly in a more complex world. Thus while it is perhaps pleasant to have single rules with absolute prohibitions, Article 2(4)'s incorporation of the Purposes' definition of aggression clearly reveals a lack of imagination and a lack of valid applicability. It should not, therefore, be considered applicable to certain unprecedented Box H circumstances.

Article 2 of the 1974 U.N. Charter of Economic Rights and Duties of States contains another relevant provision:

Every state has and shall freely exercise full permanent sovereignty, including possession, use and disposal, over all its wealth, natural resources, and economic activities.<sup>155</sup>

152. Cf. Reisman, *Criteria for the Lawful Use of Force in International Law*, 10 YALE J. INT'L L. 279, 283 (1985) (criticizing other assumptions necessary for bright line interpretation of 2(4)).

153. G.A. Res. 3314, 29 U.N. GAOR Supp. (No. 31) at 142, U.N. Doc. A/9631 (1975).

154. *Id.* at art. 5(1).

155. G.A. Res. 3281, 29 U.N. GAOR Supp. (No. 30) at 50, U.N. Doc. A/9030 (1974). Cf. Resolution on Permanent Sovereignty Over Natural Resources, G.A. Res. 1803, 17 U.N. GAOR Supp. (No. 17) at 15, U.N. Doc. A/5217 (1962) (concerning "[t]he right of peoples and nations to permanent sovereignty over their natural wealth and resources"). For a summary of the foregoing, see 1962 UNITED NATIONS Y.B. 498-504. For further discussion, see Schachter, *Armed Force*, *supra* note 108; ARSANJANI, *INTERNATIONAL REGULATION OF INTERNATIONAL RESOURCES: A STUDY OF LAW AND POLICY* (1981); Reisman, *The Third World's Fading Dream*, THE NATION, June 12, 1976, at 716.

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Again, coercive measures taken by a technological actor against a transgressive country for its refusal to make its behavior less disastrously damaging would clearly violate the “free exercise” of the sovereign use of its natural resources, which clearly constitute both an “economic activity” and “wealth.”

Our inquiry is further assisted by several explicit provisions of the Charter of the Organization of American States:

Article 15. No State or group of States has the right to intervene, directly or indirectly, *for any reason whatever*, in the internal or external affairs of any other State. The foregoing principle *prohibits not only armed force but also any other form of interference* or attempted threat against the personality of the State or against its political, economic, and cultural elements.

Article 16. No State may use or encourage the use of *coercive measures* of an economic or political character in order *to force the sovereign will* of another State and obtain from it advantages of any kind.

Article 17. The *territory of a State is inviolable*; it may not be the object, even temporarily, of military occupation or of other measures of force taken by another State, directly or indirectly, *on any grounds whatever* . . .<sup>156</sup>

International action inconsistent with these provisions may appear illegal. Quite clearly this convention casts a net so wide that any form of pressure, including economic, is prohibited interference whether direct or indirect “for any reason whatever” or “on any grounds whatever.” To the extent to which article 38(1)(b) of the Statute of the International Court of Justice<sup>157</sup> commonly informs an analysis of legality, however, an apparent violation of treaties like those mentioned above is “illegal” only to the extent that it is manifestly inconsistent with previous international activities. The technological actor turns elsewhere, then, seeking avenues of approbation for unilateral action.

### 2. *Precedent and Legal Justification for Coercive International Action: Self-Defense and International Concern*

Precedent may consist of either a similar action, or of international response to a similar action. While there are precedents for action in self-defense, and even anticipatory self-defense, there are no precedents

156. O.A.S. Charter, *supra* note 126 (emphasis added).

157. Statute of the International Court of Justice, *supra* note 143, art. 38(1) states: “The Court, whose function is to decide in accordance with international law such disputes as are submitted to it, shall apply: (a) international conventions, whether general or particular, establishing rules expressly recognized by the contesting states; (b) international custom, as evidence of a general practice accepted as law; (c) the general principles of law recognized by civilized nations; (d) subject to the provisions of Article 59, judicial decisions and the teachings of the most highly qualified publicists of the various nations as subsidiary means for the determination of rules of law.”

for action justified by the principle of superior scientific knowledge of Box H crises or planet-threatening activities. Nevertheless there have been a number of instances of coercive force in which relevant elites have acquiesced. In addition to self-defense claims, actions to promote self-determination, decolonialization, and certain humanitarian interventions have received fairly broad elite support.<sup>158</sup>

It is important to note that those actions not "supported" by the world community may not necessarily be "opposed" in any significant sense. For example, the U.N. Security Council has been so paralyzed by intractable conflicts that unilateral violations of article 2(4) have frequently received little more than public condemnation.<sup>159</sup> A broad survey of incidents suggests that such condemnation is proportional to the "reasonableness" of the act, assessed with respect to the appropriateness of the act, to the nature of the threat, and the duration of intervention. Additional criteria for evaluating potential acts of a technological actor shall be proposed below.

Although a number of factors seem to indicate the illegality of unilateral, and even plurilateral, injunctive force, a number of treaties and theories, also constituent of international law, arguably attest to the legality of such action. While perceptions of legality are only one factor among many to consider in the analysis of a proposed action, claims to legitimacy are important in justifying actions to an acting state's own citizens, and to countries whose support or acquiescence is desired.<sup>160</sup> Representative "self-defense" and "international concern" norms offer viable legal justification for coercion as a remedy to the hypothetical and are explored below. Each section will first examine existing norms, and then propose an analysis by which they may justify the hypothetical, and perhaps Box H problems in general.

#### a. *Self Defense and Terrorism: Existing Norms*

The self-defense justification<sup>161</sup> sometimes arises in the context of a state's efforts to protect its nationals abroad<sup>162</sup> and in the context of di-

158. More controversial are such things as contribution to the replacement of individuals in governments, gathering of evidence in international proceedings, and international judgment enforcement. Reisman, *Article 2(4): The Use of Force in Contemporary International Law*, 78 AM. SOC'Y INT'L L. 74, 79-84 (1984).

159. *Id.* at 77.

160. *Id.*

161. See generally D. BOWETT, *SELF-DEFENSE IN INTERNATIONAL LAW* (1958); McDougal, *The Soviet-Cuban Quarantine and Self-Defense*, 57 AM. J. INT'L L. 597 (1963) [hereinafter McDougal, *Self-Defense*]; Brownlie, *The Use of Force in Self-Defence*, 37 BRIT. Y.B. INT'L L. 183 (1961).

162. Examples of such efforts include the Belgian action in Stanleyville in 1961, the United States actions in the Dominican Republic in 1965, the rescue effort of Israel in Entebbe in

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rect efforts to combat terrorism.<sup>163</sup> Anticipatory or preemptive self-defense is even more controversial. In 1981, the United Nations and many governments harshly rejected Israel's claim of a right to anticipatory self-defense in its bombing of an Iraqi nuclear reactor.<sup>164</sup> It is certainly arguable, however, that the use of armed force to preempt terrorist acts is not a use of force directed against the "territorial integrity or political independence of another state." While this may clear the Article 2(4) hurdle, though, such action may still be inconsistent with the Purposes of the Charter,<sup>165</sup> and there have been numerous authoritative condemnations of anticipatory self-defense.<sup>166</sup>

In spite of these hurdles, significant players continue efforts to carve out a preemptive act exception to Article 2(4). For example, former Secretary of State George Shultz asserted:

It is absurd to argue that international law prohibits us from capturing terrorists in international waters or airspace, from attacking them on the soil of other nations . . . or from using force against states that support, train, and harbor terrorists or guerrillas.<sup>167</sup>

1976, the attempt of the United States in 1980 to free hostages in Iran, and the "rescue" of Americans in Grenada in 1983.

163. See, e.g., Roberts, *Self-Help in Combatting State-Sponsored Terrorism: Self-Defense and Peacetime Reprisals*, 19 CASE W. RES. J. INT'L L. 243 (1987). Recent examples include the Oct. 10, 1985 interception of a commercial Egyptian airplane carrying four members of the Palestine Liberation Front by the United States, and Israel's Feb. 3, 1986 interception of a Libyan executive jet thought to have top Palestinian leaders on board. There is debate concerning whether the United States action was a justifiable use of force under article 2(4) as a countermeasure consequent to an alleged Egyptian breach of obligations under the International Convention Against the Taking of Hostages, Dec. 4, 1979, G.A. Res. 34/146, 34 U.N. GAOR Supp. (No. 46), U.N. Doc. A/34/46, reprinted in 18 I.L.M. 1456 (1979). Some commentators argue that the action was clearly unjustifiable and violative of international norms, notwithstanding the fact that Canada, Great Britain, Israel, Switzerland, West Germany, and the Soviet Union all released statements ranging from very positive to generally supportive. *Many U.S. Allies Applaud Move, But Some Question Its Legality*, N.Y. Times, Oct. 12, 1985, at A7, col. 1; *From Soviets, Sympathy and a Barb for U.S.*, *id.*, at A7, col. 5. The Israeli action, on the other hand, received strong negative responses. It was considered unreasonable. On examination this seems attributable to, among other political factors, the inadequacy and inaccuracy of the Israeli intelligence information, the great haste with which the decision to intercept was made, and the action's lack of justification on the grounds of retaliation for specific acts. See G. Borkowski, *Use of Force: Interception of Aircraft*, 27 HARV. INT'L L. J. 761, 762-64 (1986). The U.S. interception, in contrast, was in the aftermath of the Oct. 7 hijacking of the Italian cruise liner *Achille Lauro*, in which a U.S. citizen was executed, and Palestine Liberation Front members responsible for the hijacking were known to be aboard the intercepted plane.

164. See Paust, *Responding Lawfully to International Terrorism: The Use of Force Abroad*, 8 WHITTIER L. REV. 711 (1986).

165. See Franck, *Who Killed Article 2(4)?*, *supra* note 142.

166. See generally Paust, *supra* note 164, at 717 n.21.

167. G. Shultz, *Low-Intensity Warfare: The Challenge of Ambiguity*, address to the National Defense University (Jan. 15, 1986), reprinted in 25 I.L.M. 204 (1986). This highly controversial "Shultz Doctrine" also stated: "A nation attacked by terrorists is permitted to use force to prevent or preempt future attacks, to seize terrorists, or to rescue its citizens, when no other means is available." *Id.* at 206 (emphasis added).

The U.S. attack of five targets in Libyan territory in 1986 was justified, in part, by such arguments for preemptive self-defense.<sup>168</sup> Though anticipatory strikes remain hotly debated, on balance they are considered impermissible and violative of predominant expectations.<sup>169</sup>

What values seem to predict the reactions of the international community to these various forms of self-defense? In the case of the rescue efforts, the use of force was criticized as a violation of territorial sovereignty, but jurists and many governments accepted a general legal justification for such use of force based upon at least: 1) an emergency need to save lives of nationals, and 2) nonderogation of "territorial integrity or political independence" of the state in whose territory the action occurred.<sup>170</sup> The reaction to the United States and Israeli retaliatory efforts clearly shows that force may be permitted consequent to breaches of international obligations, but must result from reliable information, strategic execution, and, most particularly, a specifically identified act to which the force responds. From the governmental and United Nations condemnations of anticipatory acts, like the bombing of the Iraqi reactor, one can infer that if a right to such action exists, it resides only when attack is imminent and when there is little time for deliberation. In short, for both retaliatory and preemptive acts, legitimacy is inextricably linked to the larger community's perceptions of reasonableness, which examines necessity, imminence, and proportionality.<sup>171</sup>

#### b. *Application of Existing Norms to the Hypothetical*

Although there is little room at the moment for a solution to the hypothetical, or Box H problems in general, within the context of acting in a way that would satisfy other countries' notions of legitimacy under the traditional criteria, perhaps a justification for the use of force might lie in a reconceptualization of the necessary meaning of words within relevant provisions of the Charter.<sup>172</sup> Article 51 of the U.N. Charter allows the

168. See, e.g., Televised statement of President Reagan, Apr. 14, 1986, reprinted in *Reagan: We Have Done What We Had To Do*, Wash. Post, Apr. 15, 1986, at A23, col. 3; see also *Administration Acts on 'Self-Defense' Principle Espoused by Shultz*, Wash. Post, Apr. 15, 1986, at A20, col. 1. One scholar suggests that anticipatory self-defense would be allowable and preferable in cases of "a distant future threat of actual attack" if only there were a way to minimize the chance of mistake and inflict less damage than if the coercion were postponed. Zedalis, *Preliminary Thoughts on Some Unresolved Questions Involving the Law of Anticipatory Self-Defense*, 19 CASE W. RES. J. INT'L L. 129, 144-47 (1987).

169. Paust, *supra* note 164, at 719.

170. Schachter, *Armed Force*, *supra* note 108, at 1629.

171. See generally Schachter, *The Lawful Resort to Unilateral Use of Force*, 10 YALE J. INT'L L. 291 (1985).

172. Cf. Bilder, *supra* note 119. While Bilder acknowledges, in passing, that it is possible to conceive of environmental situations in which self-defense may apply (such as the explosion of a test nuclear device exposing another country to lethal radiation), he would prefer not to

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use of force in cases of self-defense to "armed attack." A transfrontier use of force would certainly require a reinterpretation of "armed attack" to be justifiable.<sup>173</sup> "Armed" need not mean missiles (rather than the logging apparatus or torches of the hypothetical), and an "attack" can be an incremental and slow yet gravely disruptive assault (as the hypothetical is, and Box H problems will tend to be).<sup>174</sup> As a corollary of the self-defense justification, a state damaged by another state's breach of a treaty concerning environmental or transfrontier disruption may have a legitimate use of force claim. The EnMod Treaty,<sup>175</sup> for example, essentially prohibits the "hostile" use of "environmental modification techniques" having "widespread, long-lasting or severe effects."<sup>176</sup> To expand the applicability of this provision, one commentator has suggested expanding "hostile" to include "any hostile environmental manipulation that could be reasonably expected to result in a prohibited effect even if the environmental modification was not meant as the primary form of the attack."<sup>177</sup> Our concern for applicability to the hypothetical suggests that "hostile" be stretched even further. Some meaning of "hostility" as follows would allow likely Box H problems to come within the scope of the EnMod Treaty: the failure swiftly to effect a near-total cessation of specified be-

allow such a dangerous extension of the defense doctrine unless it were at least limited to circumstances in which the action defended a) would appear reasonable to the international community, b) would at least allege prevention of immediate harm, and c) would result in only little or no adverse effect on the offending nation or other nations. *Id.* at 71-72. None of these requirements is present in the hypothetical posited herein, and certainly not in Box H problems generally.

173. *But see* Kahn, *From Nuremberg to the Hague: The United States Position in Nicaragua v. United States and the Development of International Law*, 12 YALE J. INT'L L. 1, 21 (1987) (Professor Kahn states: "To find an armed attack is to find authorization for a military response. . . . Packed into a determination that an 'armed attack' has occurred are many of the most important functions of an international legal order. It is not a determination that should be made lightly."). *Cf.* Kwakwa, *South Africa's May 1986 Military Incursions Into Neighboring States*, 12 YALE J. INT'L L. 421, 442 (1987) (author concludes that support to opposition groups can be violative of non-intervention principles but is not an "armed attack" and that therefore only non-military response is allowable).

Of course, reinterpretation is not the province of U.S. scholars alone. Scholars from other countries have their own entrenched views on the necessity of interpreting the language of art. 2(4) and art. 51 in its plainest sense. *See, e.g.,* J. SINGH, *USE OF FORCE UNDER INTERNATIONAL LAW* 9-31 (1984) (Faculty of Law, University of Delhi).

174. Indeed one authority indicates that, "[i]n broadest formulation, this right of self-defense, as established by traditional practice, authorizes a state which, being the target of activities by another state, reasonably decides, as third-party observers may determine reasonableness, that such activities imminently require it to employ the military instrument to protect its territorial integrity and political independence, to use such force as may be necessary and proportionate for securing its defense." McDougal, *Self-Defense*, *supra* note 161, at 597-98.

175. *See supra* note 84.

176. *See* MacDonald, *How to Wreck the Environment*, in *UNLESS PEACE COMES: A SCIENTIFIC FORECAST OF NEW WEAPONS* 181 (N. Calder ed. 1968) (discussion of environmental manipulation and coercion).

177. *ENVIRONMENTAL WARFARE* 87 (A. Westing ed. 1984).

havior when openly and thoroughly informed of scientific evidence by an eminent technological nation, which evidence a reasonable person would find substantial grounds for belief that such behavior significantly increases the likelihood of disastrous effects consequent to the conjunction of the three Box H elements.<sup>178</sup> Further, if the Treaty's definition of "environmental modification techniques" is accepted, a circuit is completed that may justify, under the Treaty, international coercive actions to prevent such disasters as the hypothetical embraces. "Environmental modification technique" refers to any technique for changing, through the "deliberate manipulation" of natural processes, the dynamics, composition, or structure of space or earth, including its atmosphere, lithosphere, hydrosphere, and biota.<sup>179</sup> Certainly, Box H-exacerbating activities, such as the deforestation the hypothetical posits, constitute direct and "deliberate manipulation" of natural processes. Though the meaning of "deliberate" must imply a conscious and purposeful act, having as the intended purpose something other than the actual effects does not remove the act from the ambit of "deliberate manipulation."

Additionally, Principle 21 of the Report of the U.N. Conference on the Human Environment, commonly known as the Stockholm Declaration on the Human Environment,<sup>180</sup> declares,

States have, in accordance with the Charter of the United Nations and the principle 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.<sup>181</sup>

The injurious activity in the hypothetical lies squarely within the scope of the latter part of the Principle. Furthermore, Principle 26 states that humankind must be spared from nuclear "and all other means of mass destruction." It does not require that the destruction be either intended or immediate. Perhaps this document, too, is one further panel in the quilt of treaties that may cover the technological actor with the appearance of legal justification.

In sum, "self-defense" is a word historically used in an international context. It has had certain mutable meanings to justify certain policy

178. Implicit in the objective test for an "eminent technological nation" is the assumption that pre-existing technological capacities in diverse areas allow the more rapid achievement of expertise in a wide variety of subjects on which significant resources are only recently focused.

179. EnMod Treaty, *supra* note 84, at art. II. See generally ENVIRONMENTAL WARFARE, *supra* note 177.

180. Report of the U.N. Conference on the Human Environment, *supra* note 70.

181. *Id.* at 1420 (emphasis added). Cf. U.N. Charter of Economic Rights and Duties of States, *supra* note 155, at art. 30 ("[T]he protection, preservation and enhancement of the environment for the present and future generations is the responsibility of all States.").

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goals. But the term, and the image it conveys, should not be abandoned to the ordinary evolution of the language. It should have a meaning that encompasses the relevant dangers of the present day. Provided such a reconceptualization occurs, a "self-defense" argument may legitimate actions taken to address Box H problems.

### c. *International Concern and Human Rights: Existing Norms*

Rather than addressing only the actual damage to be sustained by the acting country and its future citizens, current norms like those incorporating international human rights indicate that certain events occurring within the territory of one state may have multiple transnational ramifications. Actions of a target country that precipitate major deprivations of the welfare of those both within and beyond its borders can be deemed to internationalize jurisdiction.<sup>182</sup>

As two scholars have stated: "If states were to be permitted to impede the organized community's efforts to rectify situations by claims that activities, however threatening, are immune from inclusive concern because they are within domestic jurisdiction, the principal purpose for which the whole constitutive structure is established and maintained could be easily defeated."<sup>183</sup> Any matter originating in one state with significant trans-frontier injurious effects may become a matter of "international concern," permitting measures ordinarily foregone in deference to sovereign immunity.<sup>184</sup>

This assertion that state responsibility coexists with state sovereignty necessarily redefines and limits the latter. This line of reasoning can be traced back at least as far as the drafting of the U.N. Charter. The history of article 2(7), for example, refers to "matters which are essentially within the domestic jurisdiction of any state."<sup>185</sup> The drafters of the clause settled on "essentially," after considering "solely," because they recognized that in the modern world it was not easy to find any matter that was solely domestic.<sup>186</sup> This made the text particularly versatile

182. McDougal & Reisman, *Rhodesia and the United Nations: The Lawfulness of International Concern*, 62 AM. J. INT'L L. 1, 15 (1968).

183. *Id.* at 14.

184. *Id.*

185. L. GOODRICH, E. HAMBRO & A. SIMMONS, CHARTER OF THE UNITED NATIONS: COMMENTARY AND DOCUMENTS 60 (3d ed. 1969).

186. *Id.* at 63. "Nothing contained in the present Charter shall authorize the United Nations to intervene in matters which are essentially within the domestic jurisdiction of any state. . . ." U.N. CHARTER, art. 2(7). It is worth noting that the move from "solely" to "essentially" might have been a double-edged sword. If the United Nations would have been forbidden from intervening in that group of X matters "solely" within a state's domestic jurisdiction, and by this article is instead forbidden from intervening in that group of Y matters "essentially" within that same state's domestic jurisdiction, the state's sovereign envelope is extended if  $Y > X$ . If on the other hand, that group of X things earlier viewed as "solely"

since it is capable of evolving as the state of the world, and the unavoidable interdependence of the world, makes necessary and appropriate. The continuing attention to the establishment of international human rights, which began with the 1945 San Francisco Conference of the United Nations, is a concrete manifestation and mobilization of "international concern."<sup>187</sup> This has, over time, stripped sovereigns of their formerly exclusive claim to rights in international law, and has eviscerated the very notion that states are sovereign entities properly impermeable to externally prevailing conceptions of appropriate government.<sup>188</sup> The early formulation of intervention for the provision of basic human rights sought to characterize the action as one essentially retaliatory for the damaging effects that the knowledge and observance of human degradation in a foreign state had on the actor's own populace.<sup>189</sup> Yet, there is a growing acceptance of the legitimacy of altruistic justifications as well. The precise meaning of international concern remains hidden and extremely complex, however, since the right to be concerned about something is distinct from the right to do something about it.

The United Nations Universal Declaration on Human Rights,<sup>190</sup> which seems to establish that certain coercive actions may be acceptable,<sup>191</sup> has fairly consistently been interpreted not to constitute an illegal or illegitimate infringement of the national sovereignty of member

within the state's jurisdiction is now viewed as predominantly composed of matters merely "essentially" within that state's jurisdiction, then X is effectively relabeled as Y, and the sovereign has lost exclusive control over matters previously controlled exclusively. The latter view appears to have prevailed, and the taxonomic change reflects an important practical and philosophical one. I am indebted to Joseph Tsai for discussion establishing the significance of this ambiguity.

187. See generally HUMANITARIAN INTERVENTION AND THE UNITED NATIONS (R. Lillich ed. 1973); Lillich, *Forcible Self-Help by States to Protect Human Rights*, 53 IOWA L. REV. 325 (1967); R. LILLICH & R. NEWMAN, INTERNATIONAL HUMAN RIGHTS: PROBLEMS OF LAW AND POLICY (1979).

188. Indeed one commentator states that "[g]ross violations of human rights are now considered to be matters of international rather than domestic concern." Sohn, *The New International Law: Protection of the Rights of Individuals Rather than States*, 32 AM. U.L. REV. 1, 7 (1982); Franck & Rodley, *After Bangladesh: The Law of Humanitarian Intervention by Military Force*, 67 AM. J. INT'L L. 275 (1973). This change, if true, marks the beginning of the "radical" notion of justifiable intervention for semi-altruistic purposes, a notion this paper seeks to accelerate.

189. See Bilder, *supra* note 119, at 75. But see the then somewhat anomalous and groundbreaking view of E. BORCHARD, THE DIPLOMATIC PROTECTION OF CITIZENS ABROAD 14 (1916) ("[W]here a state under exceptional circumstances disregards certain rights of its own citizens, over whom presumably it has absolute sovereignty, the other states of the family of nations are authorized by international law to intervene on grounds of humanity.").

190. U.N. Declaration on Human Rights, Dec. 10, 1948, G.A. Res. 217A, U.N. Doc. A/810, at 71.

191. See U.N. CHARTER, art. 42, which states that the Security Council "may take such action by air, sea, or land forces as may be necessary to maintain or restore international peace and security."

states.<sup>192</sup> Emphatically, however, it remains unresolved whether the U.N. Charter permits a state to commence military intervention within another state for the reason of safeguarding its own citizens, or the local population, from gross violations of human rights.<sup>193</sup> Many scholars and U.N. statements condemn unilateral humanitarian intervention.<sup>194</sup>

On the other hand, some scholars read Article 2(4) narrowly, exempting from prohibition such humanitarian intervention as either a species of self-defense, or as an act not directly against the "territorial integrity or political independence" of the offending state.<sup>195</sup> Criticism of military intervention to overthrow the brutal Pol Pot regime in Cambodia, for example, was not unanimous.<sup>196</sup> Senator George McGovern of the United States, for example, had previously, publicly, and explicitly called for an international military intervention to halt the "clear case of genocide" in Cambodia and to "knock this regime out of power."<sup>197</sup> Nor did unified criticism attend the Tanzanians' violent overthrow of Amin's regime in Uganda.<sup>198</sup> But praise was not forthcoming either. The Tanzanians somehow expected plaudits for their actions as an instrument of righteousness, and waited befuddled as the world waffled. Despite the past cruelty of Amin, world leaders feared the Pandoran consequences that any approval of the Tanzanian action would portend.

192. Delbrueck, *International Protection of Human Rights and State Sovereignty*, 57 *IND. L. J.* 567, 571 (1982). "As early as 1947 the United Nations General Assembly took issue with the violation of human rights in Bulgaria, Hungary, and Rumania. The Franco regime in Spain was next on the agenda and so was the question of the treatment of the colored population of South Africa. . . . France was also indicted for human rights violations in Algeria. In all these cases the General Assembly would not yield to claims of the member state concerned that the questions raised were those subject to their exclusive national jurisdiction. . . . It is established . . . that the principle of nonintervention does not apply to questions of human rights violations, although the lawful range of measures to be taken against such violations is open to discussion." *Id.* at 571-72.

193. Sohn, *supra* note 188, at 7-8.

194. Numerous U.N. members, for example, condemned India's intervention to protect the Bengalis in East Pakistan in 1971. The United States invasion of Grenada, justified as a hybrid of self-defense and humanitarian intervention, was similarly condemned by the United Nations and many of the usual U.S. supporters.

195. Reisman, *Humanitarian Intervention to Protect the Ibos*, reprinted in *HUMANITARIAN INTERVENTION AND THE UNITED NATIONS* App. A (R. Lillich ed. 1973) (written with the collaboration of Prof. McDougal; originally a petition to the United Nations in 1968).

196. Some sources suggest that the Pol Pot regime was responsible for over a million deaths. See, e.g., R. GASTIL, *FREEDOM IN THE WORLD: POLITICAL RIGHTS AND CIVIL LIBERTIES* 253 (1979).

197. *McGovern Backs Anti-Cambodian Action*, Wash. Post, Aug. 22, 1978, at A1, col. 3; *McGovern and Cambodia: "Old Shock Technique"*, Wash. Post, Aug. 26, 1978, at A8, col. 1; *Phnom Penh Falls*, Wash. Post, Jan. 9, 1979, at A18, col. 1.

198. It is estimated that 500,000 people were killed during Amin's eight-year rule. Wash. Post, May 6, 1981, at A31, col. 1. See also AMNESTY INTERNATIONAL REPORT 1978 89-92 (1979); AMNESTY INTERNATIONAL REPORT 1977 109-12 (1977).

d. *Application of Existing Norms to the Hypothetical*

In the context of Box H threats, motives for intervention are of necessity semi-altruistic rather than wholly so, but this does not negate the added impetus to action that international concern brings. Scholarly analysis of these incidents has suggested that, in addition to the two prerequisites also existing for self-defense claims (exhaustion of peaceful means and immediacy of danger), forceful humanitarian intervention requires: i) a specific purpose of remedying the human rights situation in that territory, ii) minimum force necessary for that purpose, iii) force limited in purpose, time, and scope, and iv) truly massive violations.<sup>199</sup>

The problem in seeking to slip a coercive response to the hypothetical beneath the protective blanket of international human rights is primarily with the last of the four criteria. The hypothetical, and Box H problems in general, are problems precisely because there is time-lag between actions and effects, thus massive violations may be hard to identify. Furthermore, establishing proximate cause poses a far greater obstacle here than when observing genocide or torture. Nonetheless, the concept of international concern is a valuable one, since some issues that were historically of purely domestic jurisdiction are so no longer. The Permanent Court of International Justice, in the Tunis-Morocco case,<sup>200</sup> for example, compellingly argued that certain issues could be internationalized depending upon the entire configuration of then-prevailing international relations. The efficacy and ultimate necessity of regulating transgressive policies in foreign states (even before the accumulation of massive violations) is simply the next conceptual interval of internationalization. One cannot logically extract, for example, environment-threatening activities from that zone of concern that attends to human dignity and human rights. Rather, it is the penumbra of sovereign rights that must contract sufficiently to expose environmentally deleterious policies to environmentally conservatory policing.

Quite simply, then, the "entire configuration" has changed, making necessary an extension of international jurisdiction to Box H issues. Originally, the destructive capabilities of elites were so insignificant that acts of states were not considered "international delinquencies," no mat-

199. Levitin, *The Law of Force and the Force of Law: Grenada, the Falklands, and Humanitarian Intervention*, 27 HARV. INT'L L.J. 621, 652-53 (1986).

200. Advisory Opinion on the Tunis-Morocco Nationality Decrees, 1923 P.C.I.J. (ser. B) No. 4, 7 (Feb. 7). In 1921 Tunis and Morocco enacted legislation that would have ascribed Tunisian or Moroccan nationality to individuals Britain claimed as subjects. *Id.* at 21. Asked for an advisory opinion on whether the matter of nationality is "solely a matter of domestic jurisdiction," the Court stated that "the question whether a certain matter is or is not solely within the jurisdiction of a State is an essentially relative question; it depends upon the development of international relations." *Id.* at 24.

ter how harmful they were to another state.<sup>201</sup> With increasing destructive capacity, international concern grew to prevail over domestic jurisdiction when external resources, like oceans, were involved.<sup>202</sup> But with internal resources and purely internal activities, the conflict endures. One scholarly work notes that states continue to assert rights eliminating any international inclusive competence over their internal resources, and yet it seems increasingly evident that the exclusive competence of domestic governments over the exploitation of some internal resources is unacceptable when the effects are extraterritorial and concern the welfare, and even security, of the larger community.<sup>203</sup> The plethora of material, from national, regional, and global organizations, as well as private organizations, and the global acceptance of conventions embodying strict liability for space activities and nuclear damage and certain pollution, reveal the development of community expectations.<sup>204</sup> Yet current international norms prohibit any involvement of extraterritorial authorities until issues of compensation arise, that is, until value deprivation has already occurred.<sup>205</sup> This is irrational for the genre of problem that the hypothetical illuminates.

One major problem with the current approach is merely a function of an obsolete conception of classification. In the past, a state had exclusive control over resources within its borders. Things flowing through, like rivers, were to some extent shared resources. When confronted with the problems of the hypothetical, one constructive approach would be to recognize that the trees of a country, for example, may currently be taxonomically internal, but effectively shared. The appropriate international reaction seems quite different if they are viewed as the equivalent of a vertical river, flowing upwards to the atmosphere, the disruption of which should result in accountability.

201. L. OPPENHEIM, *INTERNATIONAL LAW* 343 (H. Lauterpacht 8th ed. 1955); see also ARSANJANI, *supra* note 155, at 394.

202. ARSANJANI, *supra* note 155, at 8-9.

203. *Id.* at 8-9; see, e.g., article 10 of the International Law Association's Helsinki Rules on the Use of the Waters of International Rivers, Report of the Fifty-Second Congress, U.N. Doc. A/CN.4/ser.A/Add.I, at 477, 496-97 (1980).

204. There has been an increased concern, reflected in quite a number of conventions and conferences, about controlling injurious use of certain internal resources. For an analysis of these, see ARSANJANI, *supra* note 155, ch. 5 (concerning oceans, waterways, and air pollution) and the recent Montreal Protocol, *supra* note 87, regarding chlorofluorocarbons.

Mikhail Gorbachev's Dec. 7, 1988 address to the United Nations symbolized growing concern as it proposed a U.N. center for emergency environmental assistance and an orbiting space station designed exclusively for monitoring the state of the environment. So, too, did ABC's Sept. 12, 1989 "Capitol to Capitol" broadcast, which linked legislators from Moscow, Brasilia, London, and Washington to discuss environmental affairs. See *The Gorbachev Visit: The Problem of Mankind's Survival*, N.Y. Times, Dec. 8, 1988, at A16, col. 1.

205. ARSANJANI, *supra* note 155, at 391.

An additional obstacle remains, however, with the concept of international concern. The term, as frequently used, appears to contemplate the involvement and common concern of a number of politically relevant states. Yet Box H crises and disparities in scientific sophistication must preempt the need for happy agreement among a large number of nations; the majority vote of global neighbors cannot mystically commute superior numbers into a claim of superior understanding. If a technological actor is convinced that the concerns of all are implicated, it should act coercively, perhaps injunctively, and justify retroactively.<sup>206</sup>

### B. *An Extra-Legal Justification of Unilateral State Action*

Beyond self-defense and international concern, it is possible to justify unilateral action as an effort to ensure the welfare of others, both those currently existing and those yet to come. Admittedly, a doctrine of international civil disobedience, or the moral obligation of global guardianship, has not yet evolved.<sup>207</sup> Nevertheless, if earlier arguments prove unsuccessful in illuminating an appropriate response to Box H problems, it is still arguable that a firm belief in the overwhelming necessity of the act justifies action. This justification is, essentially, an acknowledgement that certain issues are more fundamental than the then existing climate of elite expectations (current law), which necessarily lags behind new developments in individual, social, and political values.

Marked deviation from the trajectory of international norm expectations and formulations must be rooted in obligations and rights that flow therefrom. Clearly, at the logical extreme, the abstract moment just before the threshold of irreversibility is reached invokes both obligations and rights and its implications are justification enough to suspend the "rules" of the game. It is fine that we are all fish in an aquarium, establishing various principles of how and when we swim, and in which direction. But an obsession with creating or preserving order is irrelevant when someone swims toward the glass carelessly brandishing a glass-cutter.<sup>208</sup> Thus when the most technologically advanced country becomes

206. If other elites may be convinced *post hoc*, having had their attentions focused by the willingness of the technological actor to intervene, then the action is, *de facto*, internationalized. Should the other elites remain unconvinced, either no significant sanction will befall the initial actor, or any sanction imposed will necessarily be of lesser cost than that which the actor believes would be the long-term costs of not acting.

207. See, Bilder, *supra* note 119, at 78-79. Bilder's article does not address unilateral action within another state's jurisdiction, but rather principally addresses exemplary and non-interventionist activity.

208. Indeed, at such a point even the sanctity of life must give way before the sanctity of, what has been named of the yet hospitable globe, the "carrying capacity." The term refers to the maximum strain a stable system can endure. See *Human Ecology: The Subversive Conservative Science*, 25 AM. ZOOLOGIST 469 (1985).

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convinced that that point is rapidly approaching (although it is clearly beyond plausibility that the last pre-threshold moment and the moment predicted to be such will be identical), a moral obligation to attempt to rectify the matter is created, as well as an enabling right to do so, completely irrespective of possible normative sanctions. The obligation derives from the value (increased proportionally as the affected members and magnitude of effects climb) of preventing second-party unintentional, self-inflicted harm as well as needless and simultaneous injury to innocent others. Emphatically, this obtains even if the costs incurred via inaction were to accrue primarily to the account of future generations. Other extra-legal and necessary justifications that should rise to the level of legal requirements will correspond to criteria for assessment proposed below.

## VI. Consequences

Having chosen the method of justification, what are the possible consequences of the technological actor's unilateral act of coercion? Several possible reactions to the use of force to combat a Box H problem, regardless of pre-action expectations, might ensue: members of the global community will either i) support it; ii) remain silent, acquiescing; iii) protest the act (orally, forcefully, or one following the other); iv) imitate the act; or v) engage in some combination of the above. The oral protest element is likely to consist of arguments that the act i) is without legal justification; ii) disrupts the international order; iii) is capable of commencing globe-threatening escalation; iv) asserts a right subject to abuse; v) violates various legal principles and treaties (most significantly, those respecting state sovereignty); and vi) engenders major economic, political, cultural, and legal ramifications. Certainly there is cause for community concern; under the pretext of defending self or global interests, freedom may be suppressed, and democratic institutions may be destroyed. Many totalitarian regimes cloak oppression, for example, behind the rhetoric of the "greater good." It is appropriate for other countries to feel vulnerable. Quite simply, *quis custodians ipsos custodes?*<sup>209</sup>

Yet powerful states have always been capable of violating international obligations. They may do so with impunity, or they may pay a price. But it must be recognized that there are already existing inhibitions to order-disruption. Powerful states, too, have a stake in stability and an

209. "Who shall guard the guardians themselves?"

acute sense of countervailing power.<sup>210</sup> This article cannot possibly explore the myriad political and economic ramifications caused by coercive acts. Suffice it to say that the situation is indeed complex, but that complexity does not indicate that the best course of action is inaction. A time comes when it is appropriate to act unilaterally rather than to attempt multilateral action that is, even if politically preferable, too late.

## VII. Non-Governmental Organizations: Action and Assessment

Thus far we have considered only governmental action. Two related issues must be addressed: Who else may act? and Who else may contain? Ordinarily, states have proved jealous of their relative monopoly on representative actions, and have sought to restrict or regulate individual initiative in the constitutive process.<sup>211</sup> Yet in the face of Box H threats, to NGOs belongs the domain and special responsibility of both action and reaction. Private organizations acting independently to affect governments, or with the indirect guidance or aid of a government, can exert considerable pressure directly to influence transgressive countries. Yet because of their non-affiliation with states proper, they can and should also be extremely valuable in aiding the appreciation, assessment, action, and constant evaluation of Box H problems and actions to address them. This assessment function is critically important because it may be all that contains otherwise uncheckable manipulation by powerful countries. Assessment by NGOs should therefore be both an advisable exercise and a necessary feature of truly justifiable coercive acts.

### A. *Role as Actor*

While governments are generally considered to be the significant forces of history, careful scrutiny of the demonstrated potential of NGOs reveals international networks as a potential force not to be underestimated.<sup>212</sup> Examples of international organizations without government affiliation include cartels, certain newspapers, religious, ethnic, and class

210. See generally Schachter, *Armed Force*, *supra* note 108. Given the existing decentralized international arena, there may be no greater authority, no higher guardian, than an individual state. While response to Box H problems may appear disruptive of the international order, it attempts to preserve the minimum existing conditions necessary to give the concept of order meaning. It is patently irrational to exalt intellectually elite concepts of order and fairness over minimal global stability and, perhaps, survival.

211. *Constitutive Process*, *supra* note 5, at 191, 223.

212. See generally R. WHITE, *INTERNATIONAL NON-GOVERNMENTAL ORGANIZATIONS* (1951); J. LADOR-LEDERER, *INTERNATIONAL NON-GOVERNMENTAL ORGANIZATIONS AND ECONOMIC ENTITIES* (1963); Reisman, *Sanctions and Enforcement* [hereinafter Reisman, *Sanctions*], in 3 *THE FUTURE OF THE INTERNATIONAL LEGAL ORDER* 273, 316-17 (C. Black & R. Falk eds. 1971).

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pressure groups, as well as such entities as the International Red Cross, or, in the subject of the hypothetical, Greenpeace International and "Earth First!" A number of NGOs exist that are capable of significant impact, and probably symbolic of a wide variety of NGOs available to aid in resolving Box H problems of diverse subjects. Greenpeace International, for example, founded by one man in the early 1970s, grew from 1.4 million members and \$24 million in revenues in 1985 to over 3.3 million members worldwide with 33 offices in 20 countries and revenues estimated at \$100 million in 1989.<sup>213</sup> Few organizations have equalled such growth when accepting no corporate or government grants. With a fleet of eight ocean-going ships, all patched in to a sophisticated electronic network by means of satellite communications equipment, Greenpeace continues to expand its international presence and support.<sup>214</sup> Its reputation for non-violent but head-to-head confrontation has secured Greenpeace attention in many hundreds of articles chronicling daring and startling operations.<sup>215</sup> The formula of brazen actions and high publicity is credited with such effects and policy alterations as decreased seal and whale-hunting, as well as government closures of industrial plants.<sup>216</sup> Anyone doubting the practical commotion an NGO can create might do well to consider why the French government, risking reputation as well as lives, bombed and destroyed Greenpeace's vessel, "Rainbow Warrior," in New Zealand in 1985.<sup>217</sup>

One might fruitfully consider at least nine variations of direct measures available that should be explored by both NGOs and the populace of the technological actor when confronted by a Box H problem. First, and most obviously, NGOs can be extremely effective in mobilizing popular support for an issue. NGOs can succeed, through the media, in focusing attention on a transgressive country, and thereby exerting significant indirect pressure upon the political structure there. Amnesty International and various animal rights groups have had remarkable success in this role.

Second, NGOs can be instrumental in exerting financial pressure (albeit minimal) upon the economy of a transgressive country. Such actions include organizing domestic boycotts of certain imported products, and

213. Norton, *Green Giant*, Wash. Post, Sept. 3, 1989 (magazine), at 24, 26.

214. It recently opened new offices and bases in Latin America, Antarctica, and Moscow. *Id.*

215. For example, 1) maneuvering dinghies directly into the line of fire of harpoons used by Japanese whalers, 2) handcuffing members to toxic waste drums about to be dumped at sea, and 3) scuba-diving to plug underwater discharge pipes of chemical polluters. *Id.*

216. *Id.*

217. *Id.*

encouraging a reduction in profits reaped from tourism within the transgressive country.

Third, NGOs can focus popular pressure upon domestic organizations that provide services or goods to the transgressive country. The number of corporations and municipalities that have wholly or partially divested of South African investments is a testament to the potential effectiveness of these measures.

Fourth, the same popular support can be focused upon the executive branch of the NGO's own country (or countries), exerting pressure for it to act in any way contemplated in the sections discussing governmental action herein.

Fifth, NGOs may motivate certain constituencies that can urge the legislature to regulate certain activities of the executive in its international relations. This influence can take the form of anything from low-level economic sanctions to non-recognition.<sup>218</sup> NGOs may also encourage legislation that regulates the business activities of certain domestic organizations providing services to the target country.

Sixth, NGOs can work with international organizations to heighten awareness and foster the financial, political, or moral support of foreign governments and peoples.

Seventh, as the international equivalent of the fifth method, NGOs can, in their respective countries, encourage simultaneous and functionally identical legislation that might specify circumstances or timetables under which activities of various levels of coercion are to be implemented.

Eighth, NGOs may take direct non-violent action themselves. While this possibility does not frequently occur to theorists and remains controversial, it is a practical and not uncommon phenomenon. Greenpeace, to give a concrete example in the context of the hypothetical, is an NGO routinely organized to engage in nonviolent physical interference with such activities as whaling and ocean dumping. Carrying "interference" a little further, and in contrast to the explosive growth and massive campaigns of Greenpeace, Earth First! has grown since its founding 10 years ago to only 500 people. Yet the media coverage it receives is extraordinary. In addition to sponsoring such activities as dropping banners from the Colorado Capital, handcuffing themselves to bulldozers, and demonstrating all over the country at offices and logging and uranium mining

218. Indirectly, the government can encourage the activities of NGOs by manipulating tax incentives, or by adopting a *laissez-faire* attitude *vis à vis* the direct action of NGOs, discussed as the eighth and ninth variations immediately below.

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sites, Earth First! engages in eco-sabotage: the damage and disruption of tools, processes, or results of environmentally injurious activities.<sup>219</sup>

Finally, while the least coercive and least destructive methods necessary to be effective are always preferable, it is not possible to address, logically and thoroughly, all the NGO alternatives without consideration of violence. Although we tend to regard the ability to create and deploy armed forces as a matter exclusively within the province of sovereigns, both the historical and current incidence and existence of secret or mercenarily motivated specialists in violence is not uncommon.<sup>220</sup> The Haganah, the Irish Republican Army, and Al Fatah are examples of such privately funded non-state armies.<sup>221</sup> Unofficial, private groups like these have long had a violent role in international, as well as internal, affairs. Such "private armies"<sup>222</sup> commonly do not represent a broad-based governmental or popular support, and consequently exercise sporadic powers.<sup>223</sup> Nonetheless, as some commentators have noted, the activities of private armies are not necessarily disruptive, since out of anarchy they may contribute to "stabilized disorder."<sup>224</sup> It may be that stabilized disorder, rather than accelerating entropy, is precisely the best the world can offer to confront a Box H problem.<sup>225</sup>

### B. *Role as Assessor*

Given the disturbing conclusion that in Box H circumstances coercion may be the only effective response, some criteria for assessment of legitimacy is critical. Suppose, for the moment, that the leaders of a country

219. When negotiations fail, it advocates "monkey-wrenching" tactics that include spiking radiators, putting sugar in gas tanks, spiking trees, and forcefully deconstructing logging vehicles. Though aggressively "nonviolent," the group has succeeded in drawing attention to itself by temporarily shutting down various logging operations, and dumping large stumps and sawdust in the Portland office of Senator Hatfield to protest his legislation that would prohibit judicial review of United States Forest Service logging plans.

220. Reisman, *Sanctions*, *supra* note 212, at 317 n.135. This is particularly true in the Far East and Africa.

221. *Id.*

222. Reisman, *Private Armies in a Global War System: Prologue to Decision*, 14 VA. J. INT'L L. 1, 2 (1973). Professor Reisman defines an army as "a corps of people, sharing loyalty to a common symbol, skilled in the manual of arms and operating within a command structure one of whose manifest functions is to direct corps members or 'soldiers' in the purposive exercise of violence." *Id.* at 1. He stresses that this definition is intended to sever the term from the popular contemporary connotation according to which an army must be associated with a territorial entity.

223. Some such states are treated as nation-states as a result of "the tacit or express agreement or the coincidental disinterest of the effective global elites." *Id.* at 5.

224. *Id.* at 7 (citing Wolf & Hansen, *Caudillo Politics: A Structural Analysis*, 9 CONT. STUD. SOC. & HIST. 168-69 (1967)). Cf. "One man's terrorism is another man's freedom fighting."

225. If such is the case, it may be that even those states with rigorous domestic controls may indirectly aid the goal of such violent NGOs by refusing to curtail their activities.

have announced a program gradually to increase coercion, or actually commence such a program to achieve the cessation of a particular activity pursued by foreign nationals; their allegations of Box H resound, self-righteously. Given that the justification for such action relies on a claim of the necessity of swift, effective decision and a claim to at least temporarily superior access to understanding the pieces of the Box H puzzle, what can operate to contain or check this new justification for coercion? Having just created a theoretical basis for justifiable coercion, what is to prevent this from becoming a battle flag of the imperialist, or those advantaged countries seeking to preserve the status quo? To increase justification, such coercive action requires the technological actor to develop a method of appraising the severity and magnitude of the alleged Box H problem, and a deliberative process, using a set of criteria designed to maximize the government's collective self-reflection and accountability without paralyzing its responsiveness. Ideally, the government involved should set in motion an independent procedure by which the policies and actions may be assessed. Obviously, the more inclusive the actor is in its decision making, the more legitimate its action will appear. (This entails sharing knowledge and constructively engaging the response, while reserving the executive decision.) Failing this, independently conceived organizations, NGOs, may fulfill the identical function. While actors and assessors can both be NGOs, however, it is important to recognize that not every NGO can be both actor and assessor. Those NGOs most effective in action will be those who have already assessed, while those NGOs most effective as assessors may be so precisely because they have not yet acted. It will be the responsibility of those not the target of the decision to coerce to appraise the initial cogency as well as the ongoing validity, actual accuracy, and appropriateness of the claim and the action. If public and articulate, such appraisal may inhibit the actors from initiating actions at inappropriately low levels of certainty. The following outline briefly explores a number of criteria that may be employed in appraisal. None individually is terribly complex, but all, in the aggregate, are of vital importance.

This system of appraisal is essentially a means of assessing success and imposing responsibility for abuse of power.<sup>226</sup> It is a process of cautious but not overbearing containment and post hoc evaluation, in which bolstering the latter may aid the former.

#### *I. Acquisition*

A) Has there been rigorous collection of data?

226. See generally *Constitutive Process*, *supra* note 5, at 285-86.

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- B) Is the data highly reliable?
- C) Has there been clear, open, public, and prior presentation of evidence?

### II. *Analysis and Assessment*

- A) Who is involved, and with what qualifications?<sup>227</sup>
- B) Has there been involvement of qualified, non-government individuals, including the solicitation and participation of national issue-specific non-governmental organizations?
- C) Has the behavior objected to been specifically identified and clearly articulated?
- D) Is the range of probabilities that the posited Box H problem is indeed a factual possibility significantly high?<sup>228</sup>
- E) If more than one country is a contributor to the problem, were rational standards used to select the single or several target countries as principal contributors?
- F) Has there been, and will there continue to be, sustained scrutiny and reassessment of possible combinations, sequences, and degrees of intensity of the four tools of international influence: the diplomatic, the ideological, the economic, and the military?<sup>229</sup>
- G) Have there been efforts to study post-action effects and their duration?
- H) Has the past trend in motivations and actions of the leaders of the technological country been reasonably nonexpansionist?
- I) How plausible are the possibilities of alternative motivations (e.g., reprisal, resource acquisition, etc.)?

### III. *Sacrifice*

- A) Public Efforts.
  - 1) Has there been investment of time and resources in high profile public communiques (e.g., to the domestic public, the U.N., etc.) and simultaneous efforts to share scientific techniques, data, and information?
  - 2) Have there been attempts to negotiate with target countries?
  - 3) Have there been attempts to create swift and serious international attention to the previously shared data and offending countries' actions?

227. For an examination of the separate problem of how governments can assess technology, see *Politics, Technology and Technology Assessment*, *supra* note 30.

228. Although the "significantly high" standard must be a subjective one, it is probably advisable that the percentage of certainty need not be very high. Though extreme, an example may illustrate: Russian roulette involves a 1/6 % chance that the one bullet is in one of the six chambers. Nevertheless, this small risk is "significantly high" enough to prompt most to act to avoid taking that chance. Clearly, an alarming percentage is a function of the gravity of the harm.

229. See M. McDUGAL & W. M. REISMAN, *INTERNATIONAL LAW IN CONTEMPORARY PERSPECTIVE: THE PUBLIC ORDER OF THE WORLD COMMUNITY* chs. 7-10 (1981).

- 4) Has there been a reasonable amount of time, considering the rapidity of the problem's advance, for target countries to assess the shared information and settlement proposals?
- B) Cleaning House.
- 1) Has there been strict scrutiny of the technological actor's efforts to assess its own current contribution to the problem, if any?
  - 2) Have there been swift efforts to address and curtail its own contribution to the problem, if any?
- C) Willingness to Commit Resources.
- 1) Has there been voluntary sacrifice of receivables?
  - 2) Have there been direct subsidies (in the form of money, goods, technology, personnel, and technical advisors) to aid target countries in examining and addressing the activity in question, formulating alternative plans, and instituting them?<sup>230</sup>
- D) Willingness to Take Responsibility.
- Has there been a manifested and unwavering willingness to take responsibility and a firm conviction in the cause?

#### IV. *Commitment to Minimization*

- A) Have there been obvious and effective measures to prevent collateral benefit to the actor, both nationally and individually, in economic, political, or strategic rewards?
- B) Has there been an awareness of context, an attempt not to employ far greater coercion than necessary?
- C) Has there been attention to the amelioration of target country loss?
- D) Have there been evident efforts to minimize dogma and ideological imposition attendant to the coercion?
- E) Have there been efforts to minimize the duration of coercive measures?

230. A good illustration is President Johnson's offer of aid in development to North Vietnam, *see supra* note 127. *See also* Calabresi & Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089 (1972). The Calabresian framework suggests four theoretical approaches: i) the offending country reimburses the rest of the world for the injury it creates in continuing its extraterritorially injurious activity; ii) the offending country has an immutable right to continue its activity without interference or liability, and such right may be purchased as property by the technological actor; iii) the technological actor compensates the offending country for the amount by which it is damaged by ceasing its activities with extraterritorially injurious effects; iv) the technological actor has an absolute right to prevent the offending country from continuing its damaging activities. As a purely practical matter, the first possibility is impractical and contradictory (as lesser technology and wealth tend to be inversely related) and the second is impossible in the context of Box H. The possibility mentioned in the text above, which is that of the third category, begins with such things as debt for environment swaps and transmutes to the fourth category as the perceived gravity of the harm increases.

VIII. Conclusion

The development of science in the long run is incompatible with the existence of sovereign nation-states.<sup>231</sup>

Science, which engendered the possibility of problems uniquely joining the elements of i) irreversibility, ii) universality, and iii) time-lag between action and effect, has essentially been confined by the anthropocentric fears, frailties, and ignorance of the human mind to a role that allows it to create, but not effectively to warn or guide. It is divorced from the domestic and international sociopolitical/legal arena. No less significantly, as analysis of a hypothetical Box H problem reveals, there are enormous barriers to any multilateral international cooperation that could effectively address the uniquely juxtaposed elements science may recognize. Analysis of the Box H hypothetical highlights the fundamental incapacity of our political, social, and legal systems to pass between the Scylla of haste and the Charybdis of insufficiently responsive action. Because of the cacophony of cultural and economic norms and expectations, mere institutional and multilateral reforms are not only unlikely, but unavoidably ineffective in dealing with irreversible, global, and intensely time-sensitive crises. This compels the realization that limits should apply to the exaltation of order over sense. Discerning this, the technological actor should initially act to address any contribution to the problem it, itself, is making, and then pursue plurilateral efforts, or the aid of non-governmental organizations, either as supplemental or alternative possibilities. Nevertheless, it is manifestly unclear that even these can be quickly mobilized or effective.

If unilateral actions are ultimately necessary and initiated, problems of legalizing, legitimating, and containing coercion will arise. The disparities of scientific knowledge among international actors suggest that documentary sources of law, which appear to prohibit all coercion, may usefully be reinterpreted to remove from the concept of "aggression" the parochial qualification of "intended," or even "knowing," infliction of harm. This conceptual shift appears overdue, given that it is anachronistic to assume, as current international norms do, that events of truly massive trans-boundary damage occur solely at the intention of the perpetrator. Responding with coercion to policies of a foreign sovereign effecting trans-frontier injuries is not then prohibited. Even more signifi-

231. A. BUZZATI-TRAVERSO, *THE SCIENTIFIC ENTERPRISE, TODAY AND TOMORROW*, (1977), quoted in R. CLARKE, *supra* note 56, at 164. *But see id.*, R. CLARKE, ch. 10 (examining the controversy between the view of science as above the boundaries of nation states and the contrasting view of science as a purely national instrument to further a nation's development).

cantly, the time-lag element of Box H problems requires that the concept of "immediate" harm be removed from the necessary preconditions of valid self-defense claims. The self-defense argument is further buttressed by customary international law precedents, such as the norms allowing anticipatory self-defense in response to international terrorism. Finally, the growing support for, and precedent of, non-violent and violent measures as remedies to international human rights violations illustrate a growing acceptance, crucial for addressing Box H problems, that "international concern" may legitimate the extraterritorial use of coercion to influence policy within the previously sacrosanct borders of a foreign sovereign nation. This series of justification expansions must be balanced by the specific assessment criteria herein proposed, that may help NGOs and citizens evaluate and inhibit otherwise unrestrained action when appropriate.

Quite simply, there are times when principles must either be subordinated to a goal or brought into line with it. Fabricated concepts of rights pertaining to sovereignty, jurisdiction, territory, and property have no greater significance, and engender no greater logical consequence, than a particular international configuration, at one instant in time, conceives and allows. Ideally, prescriptive and retributive expectations should adapt to unprecedented problems.

Pursuant to the goal of achieving rapid, effective, and justifiable resolution of any problems arising in the context of the elements of irreversibility, universality, and time-lag, the technologically superior countries must reconceptualize and articulate their roles, the relationship between science and law, and the legality of coercive actions that may be advisable to pursue, either in concert with a small number of other countries and non-governmental organizations or alone. This proposal to expand the envelope of justifiable intervention should not be enthusiastically embraced, only grudgingly adopted as the lesser of evils. But the mere existence of such a frightening possibility of unilateral intervention may improve the prospects for more moderate proposals: as noted earlier, common perception of a threat is the first stage of effective multilateralism.<sup>232</sup>

It is quite possible that, as time passes, particular issues of apparent urgency, like that upon which the hypothetical is loosely based, may fail

232. See generally Falk, *Global Environment*, *supra* note 63. Consider also that by imposing a template of national declaration upon the true threat of feedback degradation, the threat may be in a more immediate, less abstract, and more familiar form. The real issue is not use of coercion, but willingness to use coercion. An articulated policy often has a magical way of focusing the mind of all parties.

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to arrive in full force. Yet the genre of problem remains. Any Box H problem confronting the current international norms will find our current international community jointly at the helm of a sailing vessel, paying more attention to prospects of mutinous struggles within than to the steadily decreasing depth of the water beneath us. At what depth will the alarm be sounded? And with what speed can we effect a change of course — as the winds drive us inexorably on? Certainly, no policy is truly ideal, but better to have no one guard the guardians than to have no guardians at all. There is no *deus ex machina*, and the closest habitable planet is not nearby.