

Unpackaging the Environment

by Kenneth H. Keller

The time has come to unpackage the environment. In the three and a half decades since environmental problems first began to command public attention, they have moved from the periphery to stage center. No longer discussed only at gatherings of the converted, environmental issues are part of centrist political campaigns, the subject of major international conferences, a factor in trade negotiations and an element in the strategic plans of multinational corporations. While this attention has led to some notable successes, actions have fallen well short of needs. The question now is how to transform spotty progress and modest steps into a more consistent pattern of political support for environmental concerns, how to move from the wide recognition that a problem exists to a public consensus that it is important. It is this question that now dominates discussions among environmentalists. The strategies proposed appear increasingly to have two elements: first, to give even more visibility to the environment *per se* by creating national and international institutions devoted exclusively to studying and promoting its health; second, to identify environmental interests with other interests—as an aspect of national security, for example.

I would argue that the term itself has become too broad and overburdened to be useful in setting policy or in guiding specific governmental action. There is even a question about whether “the environment” continues to be an effective umbrella for scientific investigation. The argument here rests on the notion that the strategy for drawing attention to a problem may actually be counterproductive when it comes to finding solutions to it.

Moreover, the unbounded expansion of the concept of national security to include all threats to the well-being of a nation’s people renders the term meaningless in an operational sense. There is certainly room for reformulating the concept, but that reformulation should not be cast as a broad expansion of what “security” is taken to mean. Instead, it should focus on identifying those environmental threats that may lead to traditional security problems and those that can be responded to most effectively by military organizations.

By avoiding the temptation to label a confusingly broad category of problems with a ready-made, if slightly ill-fitting, title, we may actually contribute to a larger goal: seeing our vital interests as something broader than national security and the tools available to us to protect those vital interests as necessarily more nuanced than military action.

“THINK GLOBALLY, ACT LOCALLY”

Most people would date the emergence of the environmental movement into relatively broad public consciousness from the 1962 publication of Rachel Carson’s classic book, *The Silent Spring*, which decried the excessive use of pesticides.¹ Eight years later, the first Earth Day celebrations took place and, in 1972, the first U.N.-sponsored Conference on the Human Environment was held in Stockholm.

In those early days, environmentalism was synonymous with a rather narrow concept of conservation—the protection of nature—and the major threat was pollution. What is “natural” was distinguished from what is man-made or synthetic. “Chemicals” referred to those substances that people “made” (or industrial societies exploited, such as hydrocarbons), and, chemistry notwithstanding, it was clearly not a term meant to include proteins or lipids or carbohydrates or, for that matter, water, air or natural toxins. Technology was “appropriate” when it was unobtrusive: E. F. Schumacher’s *Small Is Beautiful* was required reading. The Stockholm Conference consciously excluded “development” from its title.

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In short, the environmental movement was coherent but driven more by strongly held values than by scientific or economic analysis, an ethos largely aesthetic and moral, perhaps even spiritual. However, although it was relatively coherent in its ideology, it made no pretense to being a central force on the world stage. “Think globally, act locally,” René Dubos’s famous phrase, was its call to action and the movement was more or less marginal.

NEW MEASUREMENTS, NEW PROBLEMS

Much has changed in the intervening years, with science, technology, demographics, economics and politics each playing a role. First, science. Our understanding of the effects of humans on their surroundings has grown with our understanding of the surroundings themselves. Ecology has come into its own as a natural science. Now increasingly quantitative rather than descriptive or value-laden, it is connected to molecular biology and microbiology, to geochemistry and geophysics, with sophisticated models and measurements to support hypotheses. Ecological studies have given us a greater appreciation of the role of biodiversity in the survival of regional biota (plant and animal life) and helped us to understand the distinctions between tropical forests and boreal forests, the role of seasonal wetlands and flood plains, the importance and fragility of coral reefs and Arctic ecosystems—and the concomitant dangers of such phenomena as deforestation, desertification, natural resource exploitation and dam building.

During these three decades, atmospheric chemists and physicists first predicted and then measured the effect of chlorofluorocarbons (CFCs) on stratospheric ozone depletion. They postulated and largely came to agreement on the reality of global warming, and they detected and came to understand acid rain, smog and other aerosol phenomena. Medical scientists, epidemiologists and demographers offered evidence or hypotheses for connections between emerging and reemerging diseases—from the Ebola virus to malaria and dengue fever—and habitat destruction; between environmental degradation and reductions in life expectancy and between power line electromagnetic fields and morbidity in children.

Much of the broadened attention to the field has come about because our measurements have become more sensitive and sophisticated; satellite-based instru-

ments give us extraordinarily detailed information about land cover and land use, about weather and temperature, about fish populations and the health of coral reefs. High altitude balloons help us determine atmospheric composition. What were once undetectable trace chemicals can now be measured easily, and the power of computers has allowed us to analyze huge volumes of data in short periods of time. Thus, science has vastly increased the range of problems that have come to be included under the rubric of the environment.

Technological advances during these three decades have played a different, but equally important, role in broadening the range of problems labeled environmental—as well as in raising the stakes and forcing on us the inescapable trade-offs between economic development and environmental stress. Polymers, or “plastics”—which can survive centuries without degrading—are now ubiquitous and have made waste disposal a major issue. Our waste products now include more toxic and radioactive materials, and we need to worry not only about where to put them, but also which countries and which groups have the technical capacity to manage them safely over geological time scales—an issue growing ever more serious as rich countries attempt to rid themselves of the problem by exporting it to those hard currency-starved countries in the developing world least able to handle the wastes. The “green revolution”—raising food production without increasing the land under cultivation (since there is no more to cultivate) through the liberal use of fertilizers and pesticides—has exacerbated the problem of pollutants and increased the energy necessary to produce

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food. The growing global appetite for energy in all forms is the most intractable problem of all. For, at bottom, to increase people’s standard of living, we require increases in productivity. Technology is the lever and energy runs the system.

But all of the practical energy sources now available generate environmental stresses. Improving the efficiency of the system, the energy it takes to produce a dollar of product, helps. Using energy sources that generate fewer pollutants also helps. But for the foreseeable future, the need to increase the standard of living of four-fifths of the world’s population will lead to significantly increased energy consumption and the production of wastes that will warm and foul the atmosphere and the waters of the earth.

How much energy consumption takes place de-

pendents directly on how many people there are to support. The equation is simple: the energy it takes to produce a unit of product, times the amount of product consumed per person per year, times the number of people on the earth, equals the total amount of energy used per year. Thus, the third factor that has expanded the scope and seriousness of environmental problems since the 1960s and 1970s is population growth.

From 1970 to 1990, the population of the world increased by 1.5 billion people, or 43 percent. Without any improvement in standard of living, this would have required a 43 percent increase in energy consumption. In fact, energy consumption doubled during the two decades.

The centrality of population growth has been a key factor in an important shift in the international political debate about the environment over these two decades. In its simplest terms, overconsumption by the North has brought us to the brink of crisis, but population growth in the South, coupled with an improved standard of living (a legitimate aspiration), will take us over the brink.

The issue is joined in the search for solutions to the problem: Who is to blame? Who should pay? Who will benefit? Where should changes take place? I will return to these questions later on.

PEOPLE AND POLITICS

A second demographic issue altering the environmental agenda is the shift of population from rural to urban settings. The development of urban centers with 10 to 20 million people in Asia and Latin America has led to a new concern about localized atmospheric problems—smog, particulate matter, oxides of nitrogen and sulfur—that affect urban health. Urban sanitation infrastructure has become a major issue, with outbreaks of cholera in cities like Lima, tales of children playing in open sewers in Africa and the threat of drinking water shortages in much of urban China. Furthermore, the separation of people from the sources of food has created a need for highways and railroads, the construction of which removes arable land from cultivation and the operation of which increases energy consumption.

Each of these developments has increased public awareness of environmental issues. This increased awareness has itself been an important goal for environmentalists as they seek to convert an issue that had once been marginal to one that is central.

Less planned have been the changes in the political significance of “the environment”—and the related ownership of the issues. New revelations about aspects of the environmental crisis or new emphases on the relative importance of its many facets have either attracted the political attention of a different cluster of groups or forced a change in the political strategy of

those with long-standing interest in these problems.

In the early days of the movement, environmental groups were either the societal dropouts of the 1960s or the Nature Conservancy / Audubon Society crowd—caricatured as a wealthy elite with more concern for the snail darter than for the desperate of the earth. The former group had little political effect; the latter did achieve some political successes through treaties such as the Convention on International Trade in Endangered Species and the international Law of the Sea (not yet ratified by the United States). The thrust of their concerns, however, led most developing countries to dismiss the movement as no more than the rich wishing to preserve the undeveloped regions of the world as large zoological gardens.

As more was learned about environmental effects *within* industrialized societies, the Green movement arose. For the Greens, the environment served as proof of the destructiveness of market-driven industrial societies, which were controlled by multinational corporations for whom the profit motive displaced any social concern. Environmental issues became inseparable from broader social issues and, in a very real political sense, were held hostage to those broader issues. This was not a time in which people sought solutions to environmental problems. Instead, they sought confrontations.

But, over time, the Greens have lost control of the movement. Other political agendas, as well as economics and the sheer magnitude of the issues, have drawn the attention of other constituencies.

“NORTH” VERSUS “SOUTH”

As the reality of global warming and the damaging effects of chlorofluorocarbons became clearer, as the costs of uncontrolled population growth became convincingly obvious, it became harder and harder for the developing world to dismiss the environment as a rich man’s movement. On the other hand, the environment became an ideal vehicle for resurrecting in the 1980s and 1990s a failed gambit of the 1970s: the notion of a “new economic world order.”

In the earlier decade, developing nations had argued that the growth in productivity and the economic success of the North had been paid for by the exploitation of the South. Therefore, the South was entitled to reimbursement. The North, on the other hand, argued that its successes were the result of its own ingenuity and hard work. Not only were its accomplishments not dependent on exploitation of the South, but the South was free to achieve the same thing on its own. Hence, no payment was justified.

The environmental facts appeared to undercut the North’s arguments. The accumulation of carbon dioxide in the atmosphere, which put the world under pressure to constrain further expansion in (and even to re-

duce) the use of cheap sources of energy based on carbon-laden fossil fuels, such as coal, had been entirely for the benefit of the North. Now the South was being asked to pay the price, either by constraining future economic growth or by bearing the higher costs for more benign or more efficient energy sources.

Furthermore, the South was being asked not to burn its forests, because the additional release of carbon dioxide would seriously exacerbate global warming and also destroy habitat, thus threatening biodiversity by causing the extinction of untold (because unknown) numbers of flora and fauna. However, the South noted, the North had already cut down a significant fraction of its own forests in order to develop its cities and feed its population, another bit of evidence that the North expected the South to pay the price of the earlier developments.²

Finally, the arguments made in the North for the importance of preserving biodiversity were given a different interpretation in the developing world. The industrialized nations argued that the South's flora were a rich source of pharmaceuticals and that biodiversity provided insurance against the inexorable transient victories of one species over another, which rendered a particular food plant vulnerable to attack or a particular microbe invulnerable to an existing drug.

But while the North pointed out the value of the South's biota, the South noted that it had never received any compensation for the germ plasm that had been removed from its lands, converted into useful products and patented and marketed. Thus the discussion of biodiversity became entwined with a discussion of the legitimate profits of biotechnology.

These issues, primarily economic and political, dominated the U.N. Conference on the Environment and *Development* (emphasis added) held in Rio de Janeiro in 1992. The terms of reference, the discussion, and the outcome were all shaded by considerations of who was to blame and who was to pay—which largely determined the position of many of the participants on the proposed conventions, both those agreed upon and those postponed.³

THE PRICE OF SUCCESS

The Greens have also been a victim of some of their own successes. As the first laws regulating the environment began to be adopted, their hold on environmental issues was eroded by the growing interest of governments and large corporations both in leveling the playing field among trading nations with respect to the costs of meeting environmental standards, and in lowering the overall costs of environmental compliance by more creative and less expensive approaches than end-of-pipeline cleanup for reducing pollution. In the business community, large corporations like 3M, Dow and Dupont recognized that their sophisticated

research organizations gave them a great advantage over small and medium-sized firms (both in the United States and abroad) in devising new processing approaches that not only reduced environment-related costs, but actually reduced overall production costs. Therefore, it made sense for them to push for rigorous and well-enforced environmental standards, harmonized across all of the countries in which they did business.

The governments of industrialized countries, having entered into a number of international agreements, such as the Montreal Protocols on Substances that Deplete the Ozone Layer, the trade in endangered species convention and certain forestry conventions, have an interest in ensuring that the obligations of those agreements are being met. Hence, environmental monitoring has become an intelligence function.

Furthermore, those countries facing domestic pressures for greater environmental regulation have been motivated to push for international harmonization. The Uruguay Round of the General Agreements on Tariffs and Trade largely avoided environmental questions, but there seems little doubt that the World Trade Organization will have to tackle a number of these issues in the future.

With the circle of parties interested in the environment continuing to grow, the cohesion of the environmental movement itself has been affected, further loosening the connection between environmental issues and the more radical social/political agenda that typified the Greens, particularly in Europe. A clearly centrist group of nongovernmental organizations has emerged, including the Natural Resources Defense Council, the World Resources Institute and others, whose goals and strategies differ from those of the Sierra Club, the Public Interest Research Groups and Earth First! The split was evident in the negotiations associated with the North American Free Trade Agreement. The more radical environmental groups opposed the agreement; the more centrist groups saw an opportunity to use the negotiations to advance the environmental agenda through sidebar agreements.⁴

SOMETHING FOR EVERYONE

Taken together, the enormous broadening and shifting ownership of the issues that make up "the environmental problematique" have clearly moved it from peripheral to central status. In the growing number of issues, almost everyone has found (or exploited) a connection. But although recognition and concern are wide, commitment is not deep, either within the United States or across the world. In poll after poll, taken at the time of U.S. national elections, almost everyone expresses concern about environmental issues, but almost no one is willing to pay for dealing with them.

Four years after the Rio Conference, only a small fraction of the money promised by the industrialized nations for the Global Environmental Facility has actually been collected or spent. Newspaper articles on recent meetings of the U.N. group established to monitor progress on commitments made in 1992 in Rio tell of failed commitments and lack of follow-through. Several of the developed nations have already announced that they will not meet their year 2000 goal of reducing carbon emissions to 1990 levels, and few nations in the developing world have shown any serious interest in adopting less polluting energy supplies if any increase in price is involved.

The fuel efficiencies of American automobiles, after improving for years in response to supply shortages triggered by the oil crises of the 1970s, have begun to creep up again despite the adverse environmental effects associated with carbon emissions. Indeed, oil companies have found it possible to essentially ignore environmental pressures in creating scenarios of future consumption. Over the last two decades, energy efficiency in the industrialized world has increased by about 30 percent. But this has exactly balanced the increasing need for energy. Actual energy use has not declined.

Indeed, one might reasonably conclude that increases in energy efficiency were driven more by the desire to avoid the capital cost of investing in new energy-generating capacity than to reduce environmental stress. Legislation to slow global warming such as the carbon tax—proposal by the Clinton Administration to tax fuel based on how much carbon dioxide it will add to the atmosphere when burned—failed. A compromise, to encourage general energy conservation by taxing the energy or BTU content of all fuels, also failed. On the other hand, the oil depletion allowance, a credit to “compensate” companies for the oil they no longer have after they take it from their wells and sell it, continues to subsidize and stimulate the use of oil.

It is a small wonder that environmentalists seek ways to convince publics and politicians alike that environmental concerns are more than an aesthetic matter and that environmental degradation is more than an issue of quality of life. And it is easy to see why some adopt a strategy that emphasizes the most dire consequences and equates environmental issues with risks that people understand. However, the usefulness of such an approach is highly questionable.

The problem is that the very process that has brought the environmental problematique to such a level of public recognition—the inclusion of a vast array of issues—has blurred it to a point that it is impractical to put all these issues in the same category or to choose (or justify) a single approach for dealing with them.

The bewildering array of issues also leaves too much room for political mischief at both extremes. At

one extreme, *all* environmental problems are dismissed by disparaging references to ones that are viewed to be of minor importance. The remark by Richard Darman, former director of the Office of Management and Budget, in a speech at Harvard—“We have not fought the wars of the twentieth century to make the world safe for green vegetables”—comes to mind. At the other extreme, draconian action to prevent or correct certain problems is justified by suggesting a connection to more serious ones.

Nowhere is the problem of the multiplicity of tenuously related issues more evident than in *Agenda 21*, the 294-page document produced at the Rio Conference as a road map for environmental research and management. Its 14 chapters and hundreds of subsections cover almost the entire range of human activity (although it is an interesting reflection on the politics of the Rio Conference that there is no mention of population management). Some of the issues, such as management of solid wastes or sewage-related problems, are essentially local and domestic. Some, such as ocean waste dumping or transboundary movement of air pollutants, are clearly international, although frequently focused on a particular region. And some, of course, such as greenhouse gas accumulation, are truly global.

DECOUPLING THE ISSUES

By unpackaging the environment—decoupling the issues—we would make it easier to understand how each fits with the political, economic, and social values and priorities of the country. We would create the flexibility to deal with them in different ways, to associate them with the foreign or domestic policy areas to which they most closely relate and to assign each of them to the agency of government most suited to handling them. The exercise may leave certain environmental issues adrift—at least in terms of government responsibility and action—but it also seems likely to promote practical progress in dealing with many others.

The task of separating environmental problems from each other is not a trivial one. Classifying problems as “global,” “regional” or “domestic” is useful, but it is only a beginning. It is certainly true that smog in Bangkok or the contamination of the canals of Venice are domestic problems, that accidents like those at Chernobyl have major international implications in the regions in which they occur, and that ozone depletion in the stratosphere is a global concern.

Being clear about the distinctions can be helpful in transforming the environmental agenda into a foreign policy agenda. But not all problems fit neatly in a single category. For example, when China burns high-sulfur coal, the carbon dioxide released to the stratosphere is of concern to the world; on the other hand, the oxides of sulfur and nitrogen, also released, that drift over

Korea and Japan are regional problems, and the fine particles that pollute the air near the power plants are primarily China's problem. An oil spill that contaminates Russian rivers is a domestic Russian problem—unless or until the oil runs into the Arctic Ocean.

The distinctions are instructive. Consider China's coal burning: from the global perspective of concern about carbon dioxide emissions, it might well be in the interest of the United States to subsidize technological investments that would diminish China's dependence on coal by increasing the efficiency of China's energy production or by enabling China to substitute other primary energy sources. However, there is less reason to underwrite the cost of clean coal technologies that may reduce oxide and particulate emissions but do nothing to cut down on the carbon dioxide released. That point is usually lost in current discussions.

From this same perspective, the Three Gorges Project—the plan for a massive dam on the Yangtze River to produce hydroelectric power for rural China—would actually serve U.S. interests by reducing global carbon dioxide emissions. Nonetheless, the United States has opposed the project because it would have clear negative consequences for the Chinese people, flooding huge areas, disturbing the local ecological balance and displacing hundreds of thousands of people.

Of course, the question of whether a problem is domestic, regional or global—or even primarily of *environmental* concern—should not entirely determine its interest to the United States. Many would argue, I believe correctly, that we need to be concerned about the destruction of the Aral Sea or the reduction of life expectancy in Russia, about the loss of arable land in China and that country's consequent inability to feed its people, about desertification in Africa that may lead to large population migrations. Even though these are domestic or *intranational* problems, they may have a significant effect on political stability and the health of the world's economy. Similarly, an outbreak of cholera in Peru or Ebola virus in a central African country is important, given the movement of people and goods throughout the world.

On the other hand, all global environmental concerns are not necessarily national concerns—or, at least, not high-priority national interests. The concern over the survival of tropical plant species because they may have medicinal or agricultural value is an aspect of biodiversity that might legitimately be characterized as an important national interest, but it would be hard to argue that the survival of elephants, whales, or dolphins, each highly developed animals well up in the food chain, belongs in the same category, even though their survival may be important to many of us.

ORIGIN AND EFFECT

A political taxonomy of environmental issues, then, would need to have a number of dimensions. In geographic terms, it might well begin with dividing the problems into domestic, regional and global categories. It would have to account for the fact that the *origin* and the *effect* of a particular problem might fall in different (or multiple) categories, a circumstance that strongly influences the policy options available and the strategies for international negotiation.

Furthermore, the time scale of the evolution of each problem is a major factor that should be reflected in the taxonomy. Those that develop over a very long period present significant challenges to action. They have little of the current political cachet associated with urgent problems, and the very uncertainty of future events leads the general public to assume that some way will be found to avoid the negative consequences. Ironically, problems that take a long time to develop are frequently those that take longest to correct, if they are correctable at all, as our current experience with ozone depletion demonstrates. Therefore, they are the ones that actually need urgent action.

Finally, we need a way of gauging the relative importance of problems in terms of national interests, which may lead to decoupling issues that would be closely linked in environmental terms or, more to the point, linked in the view of those with deep concerns about the relation of humans to nature. This has certainly been a problem in assessing various aspects of biodiversity, but it also arises in a number of other cases—in distinguishing the problem of deforestation from that of the preservation of virgin forests or the survival of the culture of native peoples, for example, or in separating the issue of overfishing from that of trapping dolphins in tuna nets.

Analyses of this kind are valuable in forcing a certain discipline on environmental discussions, requiring at the very least that a qualitative effort be made to establish connections between the science, aesthetics, ethos, and language of environmental issues and the world of policy and politics. It allows one to argue by analogy, either by establishing environmental categories that parallel such familiar ones as territorial integrity, security, economic well-being, health, opportunity, human rights, or social stability—or by subsuming individual environmental issues within those categories themselves.

In fact, one quickly learns that it is neither necessary nor useful for environmental issues, once disaggregated, to be classified separately from the traditional categories of national interest. They cover the same range and can be described in similar terms. In the language of mathematics, they map easily into the existing categories.

But as others have discovered in attempting this

“back to basics” approach to reformulating the foreign policy agenda in the wake of the Cold War, the exercise has grave limitations. It tends to fail in three ways: First, the notion of what constitutes a national interest is far less objective than proponents suggest and is determined as much by taste and symbolism as by realpolitik. Second, the interests identified are of such variant character that it is all but impossible to put them into some order of priority to distinguish the “vital” from the merely “important.” Third, national interests, no matter how well-defined and ordered, offer little practical guidance for action—there may be little we can do about the time bomb that is the population already born, no matter how vital the issue, and a great deal that we might do to deal with the lesser problem of overfishing the world’s oceans.

REDEFINING NATIONAL SECURITY

To what extent is the rubric of national security a useful way of describing the most serious environmental problems? It is certainly attractive. Is it valid? More questionable. Useful? Most doubtful.

There is an interesting dynamic at work in the proposed marriage of the two. At the same time that some environmentalists are seeking to have environmental issues legitimized by inclusion in the traditional category of security, another group, historically associated with the security enterprise, is hoping to use such non-traditional issues as the environment to define an appropriate and supportable mission in a post-Cold War world. One need not dismiss either effort cynically, but it is important to examine whether joining these issues serves a useful conceptual or operational purpose.

One advantage of traditional categories is that they are not usually subjected to close scrutiny; we expect that time will make them slightly obsolete or inaccurate, but we also assume that flexibility in interpretation will compensate for that. On the other hand, when we redefine or change categories, the changes are examined more closely for their meaning; we want to compare the old and the new and to understand the significance and the justification for the redefinitions.

Thus, the question is what else might reasonably be included in regional (or national) security that is *not* purely defense related. A minimalist’s answer might be to consider national security issues to be those that deal with violent physical threats and actions by one group or individual toward another: war between nations, terrorism, ethnic conflict, sabotage and violent crime. Another, obviously broader, interpretation would lead to the inclusion of all sorts of violent threats—those previously mentioned, plus such natural disasters as floods and earthquakes or man-made disasters, such as Chernobyl or Bhopal.

It is only a small further step to add threats of any

kind to the physical well-being of a nation’s populace—including epidemics, food shortages, mercury in fish or asbestos in schools. And, with a last leap, it could be argued that those things that threaten the economic well-being of a nation indirectly threaten its physical survival and are, therefore, also national security issues.

Each of these arguments has, in fact, been made. Taken on its own terms, each has some logic. But, of course, if everything is included, then the category of national security loses its meaning and provides no useful operational

guidance for deciding what institutions or what instruments can or should be used to address such a range of issues.

A possible and attractive middle ground would be to approach the definition of national security operationally—that is, in terms of the kinds of structures needed to deal with the threats the definition covers. Using such an approach, we would include under national security those threats to a nation’s people that must be dealt with in a short time frame and that can only be dealt with by large, highly organized operations with sophisticated information and communication networks, well-established chains of command and the capacity to react wherever the need occurs.

Obviously, this would include the traditional threats of war between nations as well as the current, somewhat broader range of threats to peace cited above. Some cogent arguments have been made that a number of regional environmental issues may well lead to such threats. Desertification, resource scarcity—particularly of renewable resources such as water, firewood and food—or local pollution giving rise to serious health problems can destabilize governments, initiate large-scale population migration and lead to interstate and intrastate violence and warfare.

But the definition would also give the military and intelligence communities the responsibility for dealing with a group of natural and man-made disasters (a relatively well-defined set of issues that seems likely to grow in frequency and magnitude as populations increase and as industrialization proceeds), as well as environmental warfare or sabotage.

Such assignments have actually been undertaken on a number of occasions in recent years. Military units have been called upon, to aid in setting up refugee camps, in food distribution, in moving masses of people and in delivering medical supplies. In the past several months, U.S. intelligence satellite observations helped

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Russia to assess the extent of damage associated with the Komi oil spill and alerted the British to the impending volcanic eruption on Montserrat, allowing them to evacuate the population of the southern section of the island.

In the past, national security has been synonymous with the nation's most vital interests. Certainly, that has been a major reason why many would like to treat environmental issues as issues of national security. The approach suggested here implies a loosening of that connection.

National security will undoubtedly continue to subsume the most *urgent* issues of national interest—including those related to the environment—but not necessarily the most *vital*. For example, the grave consequences of global warming, should the most pessimistic scenarios turn out to be accurate, might well exceed in importance the devastation caused by a Chernobyl-type accident, or the deliberate fires in the Gulf oil fields, or the violation of the international ban on the use of CFCs. But the action needed to be taken to avoid the threat of global warming is more economic than military and, therefore, global warming would not be treated as an issue of national security, although such issues as the others would be.

Limiting the definition of security in this way would be salutary in several respects. First, it would call attention to the fact that not all of the new threats to the survival and well-being of a nation can fit the old categories of foreign policy. Second, and conversely, it would stimulate discussions aimed at convincing the public that issues not included under the rubric of national security may nonetheless be of vital national interest. Third, it would promote more openness to seeking approaches other than military means to serve the vital interests of the nation.

DIVIDING THE ENVIRONMENTAL PROBLEMATIQUE

In the end, the key to further progress in dealing with environmental problems lies in dividing the issue into constituent parts and adding it to the agendas of a number of agencies and institutions. Environmental issues permeate most human activities, and environmental questions should be raised as often and as ubiquitously as political, economic and public health questions and, indeed, in the context of those other questions.

In some cases, this will require overcoming the reluctance of policymakers to introduce "extraneous" considerations into their missions. For example, many trade economists object to imposing any environmentally motivated constraints on the world trading system, although some have been grudgingly accepted.⁵

Energy is another area in which there is resistance to making environmental factors an important determinant of policy. Current U.S. policy, both domestic

and foreign, is driven almost entirely by the desire to maintain secure access to energy supplies and keep the market price low. There is little stimulus to encourage shifts in sources of energy and patterns of use, even though there are opportunities to simultaneously serve the ends of energy security (by reducing energy consumption) and the reduction of greenhouse gas emission.

But in other cases, calling attention to the environmental dimension can strengthen the case for action in policy areas that have languished in an ideological limbo. Population control programs, for example, have been treated as little more than an international and domestic political football for the past few decades. Yet, there is no area in which action would be more cost-effective in serving environmental ends. Moreover, population control is one of the few issues on which the industrialized North has a strong position in negotiating global climate change agreements.

A similar case can be made for foreign aid, currently a candidate for America's most unpopular international program. As the gradations of national interest in various environmental problems—domestic, regional, and global—are made clearer in the public mind, the practical value of foreign aid may become more readily apparent; that is, small amounts of official development assistance coupled with technology transfer offer the possibility of trading compliance on global environmental issues that are of high priority for the United States for help with local environmental problems of greater interest to the country receiving aid. For example, the United States is most concerned about climate change, ocean pollution, fishing restraints and forest preservation; developing countries need help with maintaining fresh water supplies, developing efficient energy technologies and sanitary systems and ending desertification.

Finally, dividing the environmental problematique into encompassable pieces would create multiple ownership of those pieces by many institutions in the government as well as in the private sector. This would spread responsibility for dealing with environmental problems, allow greater customization in dealing with them and increase the flexibility to move from policies based primarily on regulatory approaches to those that rely more heavily on incentives, education or technological ingenuity.

For example, the new and very promising field of "industrial metabolism" arose with the realization that creative possibilities existed to redesign production processes so that profit margins are increased at the same time that the production of undesirable wastes is reduced. Rigid comprehensive environmental regulation is likely to be less effective in promoting this approach than carefully designed Commerce Department incentives similar to the Baldrige Awards, which recognize excellence in manufacturing quality.

To give another example, tropical habitat destruction is now suspected as a major factor in viral “host-hopping”—the movement of viruses from nonhuman species to humans. That makes it an issue of serious concern to U.S. public health agencies and, as much to the point, an issue likely to command more public attention in that context.

NO “ONE SIZE FITS ALL”

Reassessing the international strategic landscape in the wake of the Cold War is no mean task. The rhetoric comes easily; giving it meaning is more difficult. Many commentators have noted—quite correctly—that the old tensions and challenges of international affairs are not likely to disappear and, therefore, the old categories of foreign policy are likely to remain important. But new issues—and problems related to the environment are certainly among them—will take on increasing importance. In understanding them and in dealing with them, we need to avoid the twin pitfalls of depending too mechanically on old categories or moving too quickly to create new ones.

That is the thrust of my argument. There is no “one size fits all” category to which we can assign the environment and no single institution that can help us meet the range of challenges it presents. As we accept that reality, we will be able to analyze the issues more subtly, to fit them into a more textured scheme of political categories and priorities and to craft microstrategies for addressing them. In the long run, this approach may allow us to circumvent the otherwise insurmountable difficulty of moving the public beyond its present level of broad but shallow concern about the environment.

NOTE TO THE READER

Despite the many forms that problems of the environment take, there is a coherent framework within which all of them can be placed.

We live in a thin spherical shell situated between the earth’s core and the expanse of space—the biosphere. In thermodynamic terms, it is a closed system; that is, no material enters or leaves the system, although energy can cross its boundaries—from the sun to the earth, from the earth to outer space. Life—both in its biological and nonbiological aspects—is, in large part, a collection of processes through which material in the biosphere is transformed from one form to another, using energy captured from the sun. We transform materials to make the constituents of our bodies and the buildings, tools, and objects we need or want. We also depend on transformations in material to capture the sun’s energy in food, trees, fossil fuels and other forms in which we can actually use it.

True sustainability—a “steady state,” in technical

terms—implies that, over long enough times, material cycles from “resource” to “useful product” to “waste” and ultimately back again to its original form. If the system worked perfectly, these cycles would keep the proportion of material in each form the same even as the processes of transformation continuously changed material from one form to another. In reality, some of the cycles take so long that, in the scale of human lifetimes, the “raw” materials associated with them are “nonrenewable.” Those whose cycles can occur in a matter of a few years are called “renewable.”

One aspect of sustainability often overlooked, or at least underemphasized, is that energy, too, must not accumulate but must, instead, cycle through the biosphere. It is captured from the sun, used to drive the processes of material transformation and released back to the universe. For both material and energy, each step in the cycle must be in balance or it will accumulate in one particular form—with undesirable consequences.

From a human perspective, how hard this whole system needs to run depends on how many people there are to support and what each person uses (essentially, the gross world product per person). As the system runs harder and harder, bottlenecks develop at different stages in the cycle. Malthus’s worry centered on our inability to convert resources to useful form—the provision of food for growing numbers. Technology has been highly successful in coping with that problem, thereby convincing many that the current threats posed by increasing population and production will also be dealt with by technology in time.

However, the bottleneck has now largely shifted to the next step in the cycle—disposing of waste products—which, in a technical sense, is vastly more difficult. It means finding ways of ridding the earth of energy that has been degraded into heat, of dispersing and diluting harmful materials that, in the process of being spread over vast areas, become less controllable or manipulable long before they become harmless or of storing and isolating them over periods of time that exceed the lifetimes of the institutions and systems designed to cope with them. It is this set of problems, and interactions among them, that represents the enormously complex and continuously growing challenge to the environment.

ENDNOTES

1. There are, of course, many antecedents to the modern movement, both scientific and philosophical. Indeed, Carson’s earlier book, *The Sea Around Us*, published in 1951, raised the issue of the fragility of the oceans and drew the reader’s attention to the growing danger of marine waste disposal.

2. This particular argument, while superficially attractive and politically useful, is actually flawed. Tropi-

cal forests are quite different from boreal forests. Species are much more confined to localized regions, so that the destruction of a small fraction of a tropical forest is more likely to lead to species extinction than cutting a similar amount of boreal forest. The trees themselves—primarily hardwood—grow much more slowly, so that replacement does not occur as quickly. And the land beneath the trees is much less likely to be useful for agriculture.

3. The environmentalists—as represented at Rio by a host of nongovernmental organizations—had more success in developing *Agenda 21*, a broad, forward-looking document that lays out an extraordinary range of environmental problems that will need to be addressed in the next several decades. Since it committed no one to anything now, there was much greater latitude in developing it.

4. There are serious questions about how effective those agreements have been thus far, but they are perhaps no more serious than the larger questions about how NAFTA is working.

5. For example, trade sanctions associated with the enforcement provisions of the Montreal Protocol on the ozone layer, the convention governing trade in endangered species and the Basel Convention on the international transfer of hazardous wastes.