The Environment in Anthropology

A Reader in Ecology, Culture, and Sustainable Living

Edited by Nora Haenn and Richard Wilk

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Acknowledgments

General Introduction to the Reader

Today, environmental problems threaten not only natural ecological qualities but also humanity's very existence. This collection of readings demonstrates the importance of anthropological theory and practice for solving environmental problems. In making selections from a large body of excellent work, we searched for highly readable articles that touch on the breadth of environmental issues that anthropologists work on. Our search found that today's anthropology of the environment is changing rapidly. Anthropologists are deploying new research methods, new interdisciplinary collaborations, and new theories to make sense of environmental problems and people's responses to them. Given these innovations and the growing size of the literature, no reader can offer more than a sample. The readings we have chosen address what we see as the key environmental questions of the 21st century. These include population growth, economic development and underdevelopment, biodiversity loss, environmental management, the future of indigenous groups, and the link between consumption and globalization. In order to tackle these questions, we offer a mix of practical case studies, theoretical debate, and discussion of moral and ethical issues.

The first section presents an overview and background of today's anthropological approaches to the environment. Students will find that many of the ideas in this section reappear, sometimes in new guises, in later contributions. Discussions of theory continue in the following sections, each of which includes one chapter authored by a prominent theorist. The sections then include examples of academic and popular reporting of cases and issues, followed by a polemical piece offering a contrarian position, and a paper that gives an ethical reflection.

Investigative pieces offer broad descriptions of environmental problems, often using aggregate statistics. Case studies of current research and action focus attention on the specific ways people are working through, or failing to address, environmental problems. The polemical pieces present opposing information to challenge other contributions, to spark discussion, and provide critical perspective. Finally, ethical discussions demonstrate that all environmental issues rest on larger questions of social justice, humanity's place in the world, and fundamental ideas about what it means to be human. We hope students will use the ethical arguments to reflect on the moral underpinnings of their own approach to environmental issues.

In order to fit so much material into an affordable reader, we have abridged the original publications by as much as one-third. We sought to retain coherence in the authors' original argumentation and maintain a narrative flow. We encourage readers,

intrigued by a particular selection, to return to the paper's complete version to gain a better sense of the argument and content.

The reader as a whole demonstrates three themes which link the topical sections. The first is the diversity of approaches to understanding environmental problems. People throughout the world face environmental crises. However, environmental issues are perceived differently by people of distinct genders, social classes, and cultural orientations. People disagree about the content of problems and what they mean to the groups affected by them. These disagreements deeply affect the ways environmental problems are solved and by whom.

A second theme is the need for creative inquiry that finds possibilities within the limits of different knowledge structures. If no single approach is a cure-all for environmental problems, then we might question how far any theory or method can take us in understanding and resolving a situation. We may find that a theory which helps in explanation is less useful in the development of practical solutions. We may find a need for multiple explanatory theories. In any case, rather than view the diversity of environmental problems and proposed solutions as leading to a stalemate, students of anthropology will find themselves uniquely positioned to develop creative intellectual and practical responses to this diversity.

The third theme is the importance of personal action in the face of environmental problems. Students in the United States are often most familiar with environmental activism centered on recycling, litter removal, and rain forest protection. Some authors here point to the need for broader forms of activism, and they make clear suggestions for change. Other authors propose or imply the need for political solutions. Transparently or not, an author's ethical position always informs her or his writing. The readings on morality and ethics should help students link moral positions to the solutions proposed by other authors. Formulating an effective personal response to environmental problems is difficult, especially as solutions are often depicted as an onerous number of small tasks ("100 Things You Can Do to Save the Environment"). These moral and ethical discussions may help students get beyond the dizzying number of environmental problems and solutions. A belief *system* puts this mixture in perspective by allowing for systematic comparison of specific issues and problems.

We believe that a combination of theory, empirical research, and ethical debate may offer the most powerful anthropological response to environmental problems. In this sense, we hope these readings serve as tools for students whose concern for ecological issues pushes them beyond cursory analyses to a more comprehensive approach.

Theoretical Foundations

This section establishes some foundations for studying human-environment issues in anthropology. Questions of how people modify, symbolize, and adapt to their immediate surroundings have intrigued anthropologists since the discipline's earliest days. Recognizing the importance of early 20th-century work, we begin here with Julian Steward's work dating from the 1950s, because his ideas have had such an enduring effect on anthropological approaches to the environment. This selection provides the outline of Steward's idea of a "culture core," those cultural features which articulate most closely with a specific environment.

Steward's writing builds on previous debates regarding environmental determinism and "possibilism." Respectively, determinism and possibilism examined whether environmental features determined or simply made possible cultural formations. By the 1950s, most anthropologists subscribed to this latter approach. Nonetheless, determinist ideas persist as researchers explore the extent to which ecologies are malleable and the extent to which people must adapt to the demands of their immediate environment. Anthropologists, thus, often focus on the creativity involved in developing adaptive systems of exploitation. Past textbooks, for example, focused on a series of adaptations to particular environments (Netting 1986).

Contributions by Emilio Moran and Robert Netting offer two ways to think about ecosystems and adaptation, two of the key terms cultural ecologists borrowed from biology. Moran describes how anthropologists borrowed the ecosystem concept from the physical sciences to assess human populations as a single element within a larger ecological setting. Practitioners working within this framework evaluated human impacts by measuring energy flows, or the transformation of solar energy into plant material, which in turn interacts with a web of animal life. This interest in energy harkens back to the work of Leslie White, discussed in Section Three, although ecosystem approaches differ from White's by using a different definition of energy. Netting's understanding of energy, for example, makes sense in light of his broader and more flexible idea of the ecosystem. Netting focuses on adaptation as a process of environmental management in which people use skill and experience in creative ways. Netting introduces ideas of sustainability to the collection and expands notions of adaptation to include not only adaptation to a physical environment but also to broader economic systems.

Anthropologists have more recently expanded beyond a focus on local communities to emphasize these broader political and economic contexts. Contributions by Conrad Kottak, Virginia Nazarea, and Dianne Rocheleau, Barbara Thomas-Slayter,

and Esther Wangari reflect on and trace these changes. All these authors call for continued changes in the objects of anthropological research, as well as the theories that frame human-environment inquiries. They want to focus attention on power structures, discourses, and identities in ecological settings. Yet, these authors never set aside the question of adaptation, a broader comparative and historical perspective, and, ultimately, the quality of human-environment interactions.

This section's ethical discussion is by I.G. Simmons, who defines "environmental ethics." Simmons then outlines the history of two major ethical positions and their current manifestations. Simmons establishes a vocabulary that appears in later selections and one with which students may begin to articulate their own ethical standpoints.

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The Concept and Method of Cultural Ecology

Julian Steward

Cultural Ecology

Cultural ecology differs from human and social ecology in seeking to explain the origin of particular cultural features and patterns which characterize different areas rather than to derive general principles applicable to any cultural-environmental situation. It differs from the relativistic and neo-evolutionist conceptions of culture history in that it introduces the local environment as the extracultural factor in the fruitless assumption that culture comes from culture. Thus, cultural ecology presents both a problem and a method. The problem is to ascertain whether the adjustments of human societies to their environments require particular modes of behavior or whether they permit latitude for a certain range of possible behavior patterns. Phrased in this way, the problem also distinguishes cultural ecology from "environmental determinism" and its related theory "economic determinism" which are generally understood to contain their conclusions within the problem.

The problem of cultural ecology must be further qualified, however, through use of a supplementary conception of culture. According to the holistic view, all aspects of culture are functionally interdependent upon one another. The degree and kind of interdependency, however, are not the same with all features. Elsewhere, I have offered the concept of *cultural core*—the constellation of features which are most closely related to subsistence activities and economic arrangements. The core includes such social, political, and religious patterns as are empirically determined to be closely connected with these arrangements. Innumerable other features may have great potential variability because they are less strongly tied to the core. These latter, or secondary features, are determined to a greater extent by purely cultural-historical factors—by random innovations or by diffusion—and they give the appearance of outward distinctiveness to cultures with similar cores. Cultural ecology pays primary attention to those features which empirical analysis shows to be most closely involved in the utilization of environment in culturally prescribed ways.

The expression "culturally prescribed ways" must be taken with caution, for its anthropological usage is frequently "loaded." The normative concept, which views culture as a system of mutually reinforcing practices backed by a set of attitudes and values, seems to regard all human behavior as so completely determined by culture that environmental adaptations have no effect. It considers that the entire pattern of technology, land use, land tenure, and social features derive entirely from culture. Classical illustrations of the primacy of cultural attitudes over common sense are that the Chinese do not drink milk nor the Eskimo eat seals in summer.

Cultures do, of course, tend to perpetuate themselves, and change may be slow for such reasons as those cited. But over the millenia cultures in different environments have changed tremendously, and these changes are basically traceable to new adaptations required by changing technology and productive arrangements. Despite occasional cultural barriers, the useful arts have spread extremely widely, and the instances in which they have not been accepted because of pre-existing cultural patterns are insignificant. In pre-agricultural times, which comprised perhaps 99 percent of cultural history, technical devices for hunting, gathering, and fishing seem to have diffused largely to the limits of their usefulness. Clubs, spears, traps, bows, fire, containers, nets, and many other cultural features spread across many areas, and some of them throughout the world. Later, domesticated plants and animals also spread very rapidly within their environmental limits, being stopped only by formidable ocean barriers.

Whether or not new technologies are valuable is, however, a function of the society's cultural level as well as of environmental potentials. All pre-agricultural societies found hunting and gathering techniques useful. Within the geographical limits of herding and farming, these techniques were adopted. More advanced techniques, such as metallurgy, were acceptable only if certain pre-conditions, such as stable population, leisure time, and internal specialization were present. These conditions could develop only from the cultural ecological adaptations of an agricultural society.

The concept of cultural ecology, however, is less concerned with the origin and diffusion of technologies than with the fact that they may be used differently and entail different social arrangements in each environment. The environment is not only permissive or prohibitive with respect to these technologies, but special local features may require social adaptations which have far-reaching consequences. Thus, societies equipped with bows, spears, surrounds, chutes, brush-burning, deadfalls, pitfalls, and other hunting devices may differ among themselves because of the nature of the terrain and fauna. If the principal game exists in large herds, such as herds of bison or caribou, there is advantage in co-operative hunting, and considerable numbers of peoples may remain together throughout the year, If, however, the game is nonmigratory, occurring in small and scattered groups, it is better hunted by small groups of men who know their territory well. In each case, the cultural repertory of hunting devices may be about the same, but in the first case the society will consist of multi-family or multilineage groups, as among the Athabaskans and Algonkians of Canada and probably the pre-horse Plains bison hunters, and in the second case it will probably consist of localized patrilineal lineages or bands, as among the Bushmen, Congo Negritoes, Australians, Tasmanians, Fuegians, and others. These latter groups consisting of patrilineal bands are similar, as a matter of fact, not because their total environments

are similar—the Bushmen, Australians, and southern Californians live in deserts, the Negritoes in rain forests, and the Fuegians in a cold, rainy area—but because the nature of the game and therefore of their subsistence problem is the same in each case.

Other societies having about the same technological equipment may exhibit other social patterns because the environments differ to the extent that the cultural adaptations must be different. For example, the Eskimo use bows, spears, traps, containers and other widespread technological devices, but, owing to the limited occurrence of fish and sea mammals, their population is so sparse and co-operative hunting is so relatively unrewarding that they are usually dispersed in family groups. For a different but equally compelling reason the Nevada Shoshoni were also fragmented into family groups. In the latter case, the scarcity of game and the predominance of seeds as the subsistence basis greatly restricted economic co-operation and required dispersal of the society into fairly independent family groups.

In the examples of the primitive hunting, gathering, and fishing societies, it is easy to show that if the local environment is to be exploited by means of the culturally derived techniques, there are limitations upon the size and social composition of the groups involved. When agricultural techniques are introduced, man is partially freed from the exigencies of hunting and gathering, and it becomes possible for considerable aggregates of people to live together. Larger aggregates, made possible by increased population and settled communities, provide a higher level of sociocultural integration, the nature of which is determined by the local type of sociocultural integration.

The adaptative processes we have described are properly designated ecological. But attention is directed not simply to the human community as part of the total web of life but to such cultural features as are affected by the adaptations. This in turn requires that primary attention be paid only to relevant environmental features rather than to the web of life for its own sake. Only those features to which the local culture ascribes importance need be considered.

The Method of Cultural Ecology

Although the concept of environmental adaptation underlies all cultural ecology, the procedures must take into account the complexity and level of the culture. It makes a great deal of difference whether a community consists of hunters and gatherers who subsist independently by their own efforts or whether it is an outpost of a wealthy nation, which exploits local mineral wealth and is sustained by railroads, ships, or airplanes. In advanced societies, the nature of the culture core will be determined by a complex technology and by productive arrangements which themselves have a long cultural history.

Three fundamental procedures of cultural ecology are as follows:

First, the interrelationship of exploitative or productive technology and environment must be analyzed. This technology includes a considerable part of what is often called "material culture," but all features may not be of equal importance. In primitive societies, subsistence devices are basic: weapons and instruments for hunting and fishing; containers for gathering and storing food; transportational devices used on

land and water; sources of water and fuel; and, in some environments, means of counteracting excessive cold (clothing and housing) or heat. In more developed societies, agriculture and herding techniques and manufacturing of crucial implements must be considered. In an industrial world, capital and credit arrangements, trade systems and the like are crucial. Socially-derived needs—special tastes in foods, more ample housing and clothing, and a great variety of appurtenances to living—become increasingly important in the productive arrangement as culture develops; and yet these originally were probably more often effects of basic adaptations than causes.

Relevant environmental features depend upon the culture. The simpler cultures are more directly conditioned by the environment than advanced ones. In general, climate, topography, soils, hydrography, vegetational cover, and fauna are crucial, but some features may be more important than others. The spacing of water holes in the desert may be vital to a nomadic seed-gathering people, the habits of game will affect the way hunting is done, and the kinds and seasons of fish runs will determine the habits of riverine and coastal tribes.

Second, the behavior patterns involved in the exploitation of a particular area by means of a particular technology must be analyzed. Some subsistence patterns impose very narrow limits on the general mode of life of the people, while others allow considerable latitude. The gathering of wild vegetable products is usually done by women who work alone or in small groups. Nothing is gained by co-operation and in fact women come into competition with one another. Seed-gatherers, therefore, tend to fragment into small groups unless their resources are very abundant. Hunting, on the other hand, may be either an individual or a collective project, and the nature of hunting societies is determined by culturally prescribed devices for collective hunting as well as by the species. When surrounds, grass-firing, corrals, chutes, and other co-operative methods are employed, the take per man may be much greater than what a lone hunter could bag. Similarly, if circumstances permit, fishing may be done by groups of men using dams, weirs, traps, and nets as well as by individuals.

The use of these more complex and frequently co-operative techniques, however, depends not only upon cultural history—i.e., invention and diffusion—which makes the methods available but upon the environment and its flora and fauna. Deer cannot be hunted advantageously by surrounds, whereas antelope and bison may best be hunted in this way. Slash-and-burn farming in tropical rain forests requires comparatively little co-operation in that a few men clear the land after which their wives plant and cultivate the crops. Dry farming may or may not be co-operative; and irrigation farming may run the gamut of enterprises of ever-increasing size based on collective construction of waterworks.

The exploitative patterns not only depend upon the habits concerned in the direct production of food and of goods but upon facilities for transporting the people to the source of supply or the goods to the people. Watercraft have been a major factor in permitting the growth of settlements beyond what would have been possible for a foot people. Among all nomads, the horse has had an almost revolutionary effect in promoting the growth of large bands.

The third procedure is to ascertain the extent to which the behavior patterns entailed in exploiting the environment affect other aspects of culture. Although technology

and environment prescribe that certain things must be done in certain ways if they are to be done at all, the extent to which these activities are functionally tied to other aspects of culture is a purely empirical problem. In the irrigation areas of early civilizations, the sequence of socio-political forms or cultural cores seems to have been very similar despite variation in many outward details or secondary features of these cultures. If it can be established that the productive arrangements permit great latitude in the sociocultural type, then historical influences may explain the particular type found. The problem is the same in considering modern industrial civilizations. The question is whether industrialization allows such latitude that political democracy, communism, state socialism, and perhaps other forms are equally possible, so that strong historical influences, such as diffused ideology—e.g., propaganda—may supplant one type with another, or whether each type represents an adaptation which is specific to the area.

The third procedure requires a genuinely holistic approach, for if such factors as demography, settlement pattern, kinship structures, land tenure, land use, and other key cultural features are considered separately, their interrelationships to one another and to the environment cannot be grasped. Land use by means of a given technology permits a certain population density. The clustering of this population will depend partly upon where resources occur and upon transportational devices. The composition of these clusters will be a function of their size, of the nature of subsistence activities, and of cultural-historical factors. The ownership of land or resources will reflect subsistence activities on the one hand and the composition of the group on the other. Warfare may be related to the complex of factors just mentioned. In some cases, it may arise out of competition for resources and have a national character. Even when fought for individual honors or religious purposes, it may serve to nucleate settlements in a way that must be related to subsistence activities.

The Methodological Place of Cultural Ecology

Cultural ecology has been described as a methodological tool for ascertaining how the adaptation of a culture to its environment may entail certain changes. In a larger sense, the problem is to determine whether similar adjustments occur in similar environments. Since in any given environment, culture may develop through a succession of very unlike periods, it is sometimes pointed out that environment, the constant, obviously has no relationship to cultural type. This difficulty disappears, however, if the level of sociocultural integration represented by each period is taken into account. Cultural types therefore, must be conceived as constellations of core features which arise out of environmental adaptations and which represent similar levels of integration.

Cultural diffusion, of course, always operates, but in view of the seeming importance of ecological adaptations its role in explaining culture has been greatly overestimated. The extent to which the large variety of world cultures can be systematized in categories of types and explained through cross-cultural regularities of developmental process is purely an empirical matter. Hunches arising out of comparative studies suggest that there are many regularities which can be formulated in terms of similar levels and similar adaptations.

Smallholders, Householders

Robert Netting

Energy and Evolution

The observation that there are two paths that lead to increased agricultural production appears to be obvious, even banal, but the labeling of these trajectories as traditional and modern, preindustrial and industrial, Western and non-Western, or even extensive and intensive, obscures the significant differences and imposes an evolutionary straitjacket on our thinking. Technological and scientific "progress" is an unquestioned good in manufacturing and distributing commodities, so it *must* be the key to "getting agriculture moving," to relieving human want and removing drudgery. The "truths" of Western scientific and engineering knowledge are deemed universal, and only isolation, "peasant conservatism," illiteracy, and poverty impede their transmission and implementation. Each stage of technological advancement from Stone Age to Iron Age, from human muscle power to horsepower, from the steam engine of the Industrial Revolution to the electricity generated by atomic fission, represents an increased capture of energy.

Cultural evolutionists from Lewis Henry Morgan, Sir Edward Tylor, Marx, and Engels to Leslie White (1943) never doubted that the discoveries and inventions that tapped larger sources of energy were the prime engines of change, providing not only more material goods but a higher standard of living, if only their fruits could be distributed equitably throughout society. The corollary view was that supplies of mechanical energy were practically limitless, and that the efficiency of transforming one form of energy to another inevitably increased.[1] Some disillusionment with the side effects of power-hungry civilizations, the degraded soils, the polluted air and water, may now have set in, but the conviction that food production has a fundamental call on energy supplies, and that only a bit of technological rejiggering is needed to spread the Western pattern successfully to a waiting Third World of peasant farms, dies hard.[2]

All energy is not, however, created equal, or equally procreative. Of the fundamental physical sources of energy, sunlight, water, land, and labor are all renewable

over time, but finite in any given period. The technically useful energy of fossil fuels is both finite and nonrenewable. Food production, always a major user of land and solar power, is differentially dependent on human labor and on fuel energy in developing and industrialized countries (Leach 1976: 3). Which factors of production will be used most freely and which will be conserved depends on their relative costs and benefits. Where land is plentiful, readily appropriated, and cheap, and where population is sparse, as on a settlement frontier, or where aridity or mountainous terrain make ordinary farming techniques marginally productive, the first choice is to economize on labor with extensive techniques like slash-and-burn cultivation or open-range herding. This is true regardless of whether we refer to the expansion of Neolithic farmers into Europe or the establishment of cattle ranches in Brazilian rain forests (National Research Council 1992: 67–75). If there are few people present and they have a variety of ways to make a living with relatively little effort, the cost of labor will be high. For intensification to take place under these circumstances, less expensive sources of energy will be sought, and there will be a heavy emphasis on increasing labor productivity, usually by mechanical means (ibid.: 15). With a market that prices the inputs of labor and fuel energy and the outputs of food, practical economic decisions can be clearly specified. The economically appropriate level of energy use is the point at which the marginal monetary value equals the cost of the increment of energy (Lockeretz 1984).

Sustainability: In the Eyes of Beholders and Smallholders

Sustainability is a term that has buzzed rapidly into the popular consciousness trailing clouds of positive affect, which are also evoked by *ecology*, *conservation*, and *environmental protection*. *Sustainability* is a prime candidate to be the watchword of the 1990s, and it is increasingly attached to the agroecology of the smallholder. I have especially emphasized the existence of favorable energy input/output balances on household-operated smallholdings and the dangers of environmental degradation, but the concept of sustainability in common usage covers a multitude of values and goals (Lockeretz 1990; Barbier 1987). Terry Gips (cited in Francis and Youngberg 1990: 4) maintains that "a sustainable agriculture is ecologically sound, economically viable, socially just, and humane." In an Agency for International Development concept paper, sustainability is "the ability of an agricultural system to meet evolving human needs without destroying and, if possible, by improving the natural resource base on which it depends" (cited in ibid.: 5). Sustainable production is an "average level of output over an indefinitely long period which can be sustained without depleting renewable resources on which it depends" (Douglass 1985: 10). These definitions combine environmental parameters with economic and social characteristics in the context of changing interactions.

Several dimensions of sustainability, the physical, chemical, biological, and socio-economic, are identified in the literature (Schelhas 1991), with the degree of emphasis and analytic detail often depending on the scientific specialization of the investigator.[3] There is also a prevailing assumption that traditional cultivators, because of their

low-energy technology, diversified production, small-scale operations, subsistence rather than market orientation, settlement stability, and lack of manufactured inputs, will occupy the sustainable end of the continuum, as opposed to commercial and industrial agriculture. In fact, the presence of these characteristics and their presumed interaction through time must be demonstrated, especially in the case of intensive cultivators, who modify the natural environment more profoundly and permanently than certain other types of land users. Unfortunately, measurements of the following relevant factors through time are seldom available in the case of either smallholder systems or large industrial farms:

1. Physical: soil degradation through erosion, weathering, compaction; diminished water supply, flooding, salinization; depletion of nonrenewable energy sources. Smallholders' techniques of terracing, contour mounding, drainage, irrigation, and diking may in fact be highly developed, and their use of fossil fuels minimal, but environmental deterioration owing to climatic perturbations or gradually increasing overuse may become apparent.

2. Chemical: decline in soil-nutrient status; decreasing responses to chemical applications, necessitating higher dosages; buildup of local or regional toxicity from the residues of fertilizers, pesticides, and herbicides. Rapid population increases among intensive farmers with no other economic options or the drive to raise production rapidly for the market may put pressure on resources so great that yields decline. There are unresolved questions as to whether the high-yielding seeds, chemical inputs, and mechanization of the Green Revolution as adopted by many smallholders will compromise their agricultural sustainability.

3. Biological: loss of biodiversity; declining ecosystem stability and resilience. Only groups of low-density foragers or shifting cultivators in large natural ecosystems may pose no threat to biological diversity (Schelhas 1991). Intensive cultivation can replace natural ecosystems, prevent their regeneration, and cause absolute declines in natural biodiversity. The substitution of an artificially diversified system of polycultures or interplanting, integrated crop/livestock regimes, and crop rotation can, however, increase total yields, while reducing yield variability, insect predation, and weed competition (Altieri 1987; Gliessman 1984). Such systems appear to be biologically more stable and more energy-efficient than the monocultures characteristic of largeholders.

4. Socioeconomic: providing sufficient sustained economic returns over the long run on existing cultivated lands so that people can achieve a continuing adequate livelihood (Schelhas 1991). Since the goals are social and economic, variable cross-culturally, and potentially changing through time, such sustainability is particularly difficult to measure objectively (Barbier 1987). Stable production may not be consonant with rising subsistence needs, greater market participation, lower agricultural prices, or higher input costs.

My emphasis on the process of intensification suggests that smallholders do indeed adapt to changing population and market forces, and that households have a variety of off-farm production strategies. This book is, in fact, more directly concerned with the dynamics of smallholder social and economic systems as they encounter the challenge of long-term biological sustainability than it is with the physical stability of such ecosystems. The management choices that the smallholder makes in the light

of intimate knowledge of the land are unlikely to involve short-range maximization of production. Farmers who survive must hedge against the uncontrollable fluctuations of the climate *and* the market. The very long time-horizon of the family's intergenerational security and its valuable, heritable property give the smallholder household a unique perspective on sustainability. There is room to question the doctrinaire position of many "deep ecologists" that sustainable production and economic growth are incompatible goals (Hildyard 1995), or that a market economy, population increase, and the new technologies of capitalism are inevitably at odds with sustainable systems (Weiskel 1989). But the suggestion that smallholder systems that can be shown to be sustainably productive, biologically regenerative, and energy-efficient tend also to be equity-enhancing, participative, and socially just (Barbier 1987: 104) is stimulating and provocative. Indigenous smallholder systems that show a favorable energy input/output balance, achieved by the application of labor and management rather than large amounts of unrenewable energy, exhibit a feasible solution to the problems of resource exhaustion, pollution, and environmental degradation that so often accompany large-scale, energy-intensive agriculture.

NOTES

1. Leslie White's "law of cultural evolution" ("culture develops when the amount of energy harnessed by man per capita per year is increased; or as the efficiency of the technological means of putting this energy to work is increased; or, as both factors are simultaneously increased" White 1943: 338) explicitly focuses on variable nonhuman energy in tools and practices such as agriculture, while the human energy factor, along with particular skills, is treated as a constant. More "need-serving goods" come, not from more person-days of work with equal or even declining returns to labor, but only from the technological capture of energy that increases "the productivity of human labor" (ibid.: 346). "Efficiency" is ambiguously defined as "the efficiency with which human energy is expended mechanically, … the efficiency of tools only" (ibid.: 337), but no attempt is made to measure human or other energy inputs quantitatively or to address the inverse relationship between increasing returns on human work and potentially declining returns on mechanical energy. (Analogies between low-cost electricity and the energy of a human slave [ibid.: 345] are merely anecdotal.) When evolution is modeled in this reductionist manner, technological change raising the amount of energy used per capita precedes and produces population growth, improves human well-being and comfort, grants "independence of nature," and raises output per unit of labor (ibid.: 342–43). To the degree that the smallholder adaptation is a low-energy alternative with less mechanical and more human energy expended, it would presumably be judged evolutionarily retrograde or reflecting a barrier to cultural development.

2. The evolutionary assumption that manual labor in agriculture is backward, extremely time-consuming, onerous, and coerced, and that replacement of such labor by technological energy is therefore the only route to abundance and freedom, is still very much with us. "An old saying has it, 'slavery will persist until the loom weaves itself.' All ancient civilizations, no matter how enlightened or creative, rested on slavery and on grinding human labor, because human and animal muscle power were the principal forms of energy available for mechanical work. The discovery of ways to use less expensive sources of energy than human muscles made it possible for men to be free. The men and women of rural India are tied to poverty and misery

because they use too little energy and use it inefficiently, and nearly all they use is secured by their own physical efforts. A transformation of rural Indian society could be brought about by increasing the quantity and improving the technology of energy use" (Revelle 1976: 974).

3. Gordon Conway and Edward Barbier point to a source of confusion in the different definitions that various disciplinary groups attach to the term *sustainable agriculture* (1990: 9). Four interpretations are: (1) agriculturalists: food sufficiency by any means; (2) environmentalists: responsible uses of the environment, stewardship of natural resources; (3) economists: efficiency, the use of scarce resources to benefit present and future populations; and (4) sociologists: production consonant with traditional cultures, values, and institutions. Clearly, the productivity, stability, and equitability that are the goals of sustainable development projects may be in conflict, and there are necessary trade-offs among them (ibid.: 39–43).

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Ecosystem Ecology in Biology and Anthropology

Emilio Moran

From the broad generalities of the environmental determinists and the detailed inductive findings of the possibilists, Steward proposed a research method that paid careful attention to empirical details and that causally linked the *cognized environment*,[1] social organization, and the behavioral expressions of human resource use. Steward delimited, more than anyone before him, the field of human/environment interactions. He viewed social institutions as having a functional unity that expressed solutions to recurrent subsistence problems. Steward's use of functionalism was concerned with the operation of a variable in relation to a limited set of variables, not in relation to the entire social system, and thus did not fall prey to the weaknesses of then current British functionalism. British functionalists emphasized the role of social institutions in the maintenance of structural equilibrium. Steward steered "cultural ecology" towards a concern with how single systems change through time and how the causal relationships within that system can actually lead to change.

Most attempts to operationalize the cultural ecological approach required modifications of the basic research strategy laid out by Steward (cf. Netting 1968; Sweet 1965; Sahlins 1961). His concept of the culture core proved to underestimate the scope, complexity, variability, and subtlety of environmental and social systems (Geertz 1963). The cultural ecological approach of comparing societies across time and space in search of causal explanations was judged to be flawed a decade later. Vayda and Rappaport (1968), among others, found the concept of the culture core, and the cultural ecological approach, to give undue weight to culture as the primary unit of analysis, and found the presumption that organization for subsistence had causal priority to other aspects of human society and culture to be both untested and premature (Geertz 1963).

Ecosystem Ecology in Anthropology

Critiques of Steward's cultural ecology paradigm led anthropologists towards a more explicitly biological paradigm. Geertz (1963) was the first to argue for the usefulness of

the ecosystem as a unit of analysis. Its merits were eloquently stated: systems theory provided a broad framework, essentially qualitative and descriptive, that emphasized the internal dynamics of such systems and how they develop and change. The explicit adoption of biological concepts in anthropology led to provocative and sometimes productive results. As early as 1956, Barth applied the concept of the "niche" to explain the behavior of adjacent groups and the evolution of ethnic boundaries. Coe and Flannery (1964) noted the use of multiple ecological niches by prehistoric peoples of South Coastal Guatemala. Neither the niche nor other concepts from biology had as significant an impact on anthropological thinking, however, as did the ecosystem concept (with the possible exception of the concept of adaptation, see discussion in Little 1982).

The ecosystem approach was attractive to anthropologists for a number of reasons. It endorsed holistic studies of humans in their physical environment. It was elaborated in terms of structure, function and equilibrium that suggested the possibility of common principles in biology and anthropology (Winterhalder 1984). No less important was the connection between ecosystem ecology and advocacy of habitat and species preservation connected with concern for non-industrial populations at a time of deep environmental and social concern (i.e. the 1960's and 1990's).

Each subfield of anthropology was differentially affected by the ecosystem approach. Archeologists have always been conscious of the environmental context of society. However, in many cases the environment has been treated as a static background against which human dynamics occur (Butzer 1982:4). In part, the problem was the lack of "an adequate conceptual framework within which to analyze complex interrelationships among multivariate phenomena" (*ibid.* p. 5). The seminal paper in archeology may have been Flannery's (1968) in which he postulated the useful applications of systems theory to archeological investigations. According to systems-oriented archeologists, "culture is defined not as aggregates of shared norms (and artifacts) but as interacting behavioral systems" (Plog 1975:208). Emphasis was given to variability, multivariate causality and process (Clarke 1968).

In archeology, the ecosystem approach has proven to be a useful heuristic device leading archeologists to think in terms of systemic interrelationships. It was rarely used as a spatial unit of analysis. Thus, archeology did not fall into the trap of making ecosystems coterminous with biogeographical units or sites. Rather, the ecosystem approach encouraged the study of the landscape at large, the use of catchment analysis and a movement away from sites to larger regional surveys. Ecological archeology has benefitted from the breadth of the concept and appears not to have suffered from many of the problems that seem to have plagued ecosystem research in physical and social anthropology. Unlike energy flow studies (or decision-making studies), which emphasize present-time measurement, ecological archeology deals with spatio-temporal variability. The long time frames of the archeological record reflect aggregate changes in the physical environment and in the material manifestations of social and cultural change (Butzer 1982), thereby avoiding the pitfalls of synchronic equilibrium-oriented functionalism (Smith 1984).

Special note must be taken that archeology has found that ecosystems are particularly useful when they model regional-scale systems, rather than individual sites or

communities. This is consistent with the higher level of organization which ecosystems represent in biological systems and may very well imply that social anthropologists and bioanthropologists may want to do likewise in the future. Processes like agricultural intensification may have multiple causes, not necessarily environmental ones. The ecosystem approach can accommodate such a view—indeed, it always stood for modelling complex systems in which the forcing functions became clear only in the course of studying the whole gamut of interrelations.

In physical anthropology, Little (1982) has noted that in the 1950's interest developed in the study of adaptation to environment. This "new physical anthropology" focused on studies of body morphology and composition, physiological response to environmental stress, demographic and health parameters of adaptation, and genetic attributes of populations (Harrison *et al.* 1964).

The research of the new physical anthropologists found support in the International Biological Program (IBP) which began *circa* 1964. A "human adaptability" section was included in the program, intended to cover "the ecology of mankind" from the perspectives of health, environmental physiology, population genetics, developmental biology, and demography (Weiner 1965). Even though doubts were expressed at the 1964 symposium at Burg Wartenstein about the omission of social/cultural aspects of adaptability, the perceived gap between the methods of human biology and social science led to no solution to this problem (Weiner in Worthington 1975). Only a decade later did an IBP workshop begin to seek ways to bring together ecologists and social scientists so that humans could be incorporated into the IBP ecosystem approach (Little and Friedman 1973).

The 1964–74 decade of IBP research led to more sophisticated methods and greater awareness of the limitations of original formulations. Practitioners now go beyond evaluating systems in terms of a single flow and, instead, consider multiple flows and constraints. Indeed, energy flow analysis[2] is seen as a method quite distinct from an adaptive framework or any other theoretical stance (Thomas 1973). The flaws of human energy flow studies carried out in the 1960's and early 1970's (cf. critique in Burnham 1982) resulted from preliminary efforts to test the utility of the new methods for anthropology. Indeed, energy flow analysis is a convenient starting point in understanding the complexity of human systems—systems in which social relations and historical process play a primary role (Winterhalder 1984). To fully understand them, however, other methods are more appropriate to social and ideological analysis.

In social anthropology and human geography, ecological studies have become common since the 1970's. The majority of studies have not depended on the ecosystem approach, although some notable ones have (e.g. Rappaport 1967; Clarke 1971; Kemp 1971; Waddell 1972; Nietschmann 1973). For all intents and purposes, the use of ecosystems as units of analysis did not radically alter the scope of research: research still focused on small, non-urban communities.

A generation of anthropologists, trained in ecology and systems theory, went to the field to measure the flow of energy through the trophic levels of the ecosystems of which humans were but a part (Rappaport 1967). The choice of research site was still a local community, often treated as a closed system for the purposes of analysis. Emphasis on micro-level study in ecology was well argued by Brookfield (1970) who

pointed out that an adaptive system can best be studied at this level because such a system model "acquires the closest orthomorphism with empirical fact" (1970:20). Micro-level studies using the ecosystem as a "unit of analysis" have provided valuable insights into flow of energy, health and nutritional status of populations, relative efficiency rates of various forms of labor organization and cropping practices, and social organizational aspects of subsistence strategies (cf. discussion in Netting 1977, Moran 1982, 1981).

Efforts to measure the flow of energy and the cycles of matter through human ecosystems served to detail more than before the environmental setting of specific populations. Energetics emphasizes the collection of data on a sample of components and flows so that the data may be aggregated and used in simulation models. The goal is to understand system dynamics by manipulating rates of flow given current conditions in the ecosystem. However, the value of these measures in studying small scale populations may have been overestimated in the 1960's. Flow of energy and cycles of matter are aggregate measures appropriate to macro-ecosystem description, but provide little insight into human variation in resource use in given localities—a matter of great interest in anthropology (Smith 1984).

Just as the ecosystem approach helped biology broaden its interests to include neglected physical environmental factors, so it affected anthropology. The ecosystem approach provided greater context and holism to the study of human society by its emphasis on the biological basis of productivity and served as a needed complement to the cultural ecology approach. By stressing complex links of mutual causality, the ecosystem approach contributed to the demise of environmental and cultural deterministic approaches in anthropology and took it towards a more relational and interactional approach to analysis even if practitioners preferred to dissociate themselves from the concept (cf. Johnson and Earle 1987; Grossman 1984; Richards 1985; Morren 1986; Little and Horowitz 1987; McCay and Acheson 1987; Sheridan 1988).

A number of problems emerged in the process of applying the ecosystem approach to anthropology (see also the assessments by Vayda and McCay 1975; and Winterhalder 1984): a) a tendency to reify the ecosystem and to give it the properties of a biological organism; b) an overemphasis on predetermined measures of adaptation such as energetic "efficiency"; c) a tendency for models to ignore time and structural change, thereby overemphasizing stability in ecosystems; d) a tendency to neglect the role of individuals; e) lack of clear criteria for boundary definition; and f) level shifting between field study and analysis.

Reification of the Ecosystem

The tendency of some authors to reify the ecosystem and to transform the concept into an entity having organic characteristics appears to have been a product of the initial excitement generated by the notion of ecosystem. When the volume *The Ecosystem Concept in Natural Resource Management* (Van Dyne 1969) appeared, the editor and some of the contributors noted that they were at the threshold of a major development in the field of ecology. The concept was hailed as an answer to the divisions

within bioecology and gained a large popular following during the "ecology move-ment" of the 1960's and early 1970's—perhaps because of the very superorganic and equilibrium characteristics that were later to be faulted. It is evident that, for some, ecosystems became a shorthand for the biome or community and that this heuristic-ally useful physical/biological construct was unwittingly endowed with purely biolog-ical attributes. As Golley has noted, it is generally understood that ecosystems are subject to the laws of biological evolution but they are also subject to laws not yet completely understood and that are not exclusively biological (1984).

When an ecosystem is viewed as an organic entity, it is assigned properties such as self-regulation, maximization of energy through-flow, and having "strategies for survival." This view is similar to earlier "superorganic" approaches in anthropology (Durkheim 1915; Kroeber 1917; White 1949). Few ecological anthropologists today would accept the notion that ecosystems "have strategies" and even fewer would sug-gest that energy maximization is always "adaptive" in human ecosystems. The notion of self-regulation is more problematic since it devolves around the question of whether ecosystems per se can be cybernetic, e.g. use information for self-regulation (Engelberg and Boyarsky 1979). Patten and Odum (1981) believe this to be a pseudois-sue that distracts us from more fundamental concerns: how are we to think about ecosystems and how are we to place them within the scheme of known systems?

"The Calorific Obsession"

Perhaps no other problem has received more attention within anthropology in recent years than the charge that ecosystem studies were "obsessed with calories". Many young scientists took great pains to measure energy flow through ecosystems under the assumption that energy was the only measurable common denominator that structured ecosystems and that could serve to define their function. Energy flow stud-ies conducted in the 1960's and 1970's demonstrated the descriptive usefulness of energetics before, during, and after field investigations. What they also proved was that the forcing functions of ecosystems varied from site to site and that it was naive to postulate energy as the organizing basis for all extant ecosystems (e.g. Kemp 1971; Rappaport 1971; Thomas 1973; Moran 1973; Vayda and McCay 1975; Ellen 1978).

The early energy flow studies delineated flows of energy and established magni-tudes. They did not, however, give sufficient attention to the numerous decisions made which control those same flows (cf. Adams 1978). Winterhalder suggests that energy flow studies stand to benefit from joining hands with neo-Ricardian econom-ics, given the latter's emphasis on the circular processes in which consumption feeds back into production. "Adapted to neo-Ricardian theory, energy flow methods could help to rigorously quantify and trace the partitioning of production" (1984:305). This has taken place in part in the study of optimal foraging strategies among hunter/gatherers (Smith 1984; Winterhalder and Smith 1981) and has been suggested as ap-plicable to horticultural populations (Gudeman 1978; Keegan 1986).

Today, few would suggest that measurement of energy flow ought to be *the* central concern of ecosystem studies. Concern has shifted, instead, to material cycling and to

the impact of external factors upon given ecosystems (Shugart and O'Neill 1979; Barrett and Rosenberg 1981; Cooley and Golley 1984). Bioecologists are less concerned today with calories than with the loss of whole ecosystems, with loss of biotic diversity, and with species extinction (Jordan 1987; National Science Board 1989).

Ignoring Historical Factors

Next to the "calorific obsession," ecosystem research has been faulted most often for ignoring time and historical change. Past construction of ahistorical models, in turn, led to an apparent overemphasis on stability and homeostasis rather than on cumulative change. The emphasis on self-maintenance and self-regulating characteristics of ecosystems (Jordan 1981) also contributed to a view that man's role was essentially disruptive of "natural processes." Research shows that attention to history is not incompatible with ecosystem research. Recent inclusion of a historical dimension in ecosystem studies provides an appreciation of the processes of stability and change in human ecosystems. At any given time, systems appear to be seeking, or be at, equilibrium, whereas over time they appear to be undergoing continuous and cumulative change leading to structural transformation.

It is paradoxical that ecological anthropological studies have only rarely explored the population variable over time, given the importance of demographics in population ecology. In part, the reason must be sought in the very study of isolated small communities lacking historical records of births, deaths, and marriage. To see a human ecosystem in process, rather than as a synchronic snapshot, requires dependable, continuous, and relatively complete records for a population over a long period of time. Such ideal conditions are rarely found except in modern-period Western Europe and North America.

Demographically deep studies represent a relatively new direction in ecological anthropology (cf. Baker and Sanders 1971; Cooke 1972; Polgar 1972; Zubrow 1976; Netting, 1981; Hammel 1988). Demographic studies lead us away from models emphasizing closure, constraints to energy flow and negative feedback and toward questions emphasizing evolutionary change in systems (Zubrow 1976:21). Without such time depth, it is not possible to explain how systems come to be nor how they change. Additionally, population data have the advantage of being observable, replicable, quantifiable, and cross-culturally comparable (Zubrow 1976:4).

The change from a synchronic to a more diachronic ecological anthropology does not require an abandonment of the ecosystem approach. What it does imply is an extension of the tools of ecological analysis to include also the tools offered by historical demography. The seminal work on this topic is generally acknowledged to be Boserup's *The Conditions of Agricultural Growth* (1965). Cohen (1977), Basehart (1973), Bayliss-Smith (1974), Berreman (1978), Harner (1970), Netting (1973), and Vasey (1979), are but a few of the many who sought to test the validity of Boserup's thesis that population growth drove technological change and the move towards intensification. The tools of historical demography to date have required extensive records of property owned and controlled by households, records of household composition and labor supply,

and both total production and marketable production. Whether what we learn about human population dynamics in these settings can be applied to the human/habitat interactions of preindustrial foragers and isolated horticulturalists remains to be seen. It can be argued, however, that the worldwide incorporation of scattered socio-political units within larger economic and political systems makes it impossible to treat local communities anymore as closed systems even for analytical purposes.

The Role of Individuals

Ecosystem approaches have tended to focus on the population and neglected the decision-making activities of individuals. In part, this resulted from the higher level of organization that ecosystems represent within the scheme of systems and from the cybernetic and equilibrium assumptions that usually accompanied it. Adoption of an individual, micro-economic and neo-Darwinian evolutionary approach, to the neglect of an ecosystem approach, is likely to create as many problems as it solves. Evolutionary and ecosystem perspectives should be seen as complementary, rather than exclusionary—e.g. energy flow studies would benefit from knowing how the actions of individuals choosing from among alternatives alter flow networks (Winterhalder 1984). On the other hand, some questions (e.g. desertification, global warming, and tropical deforestation) demand that units larger than individuals be engaged in analysis (Schlesinger *et al.* 1990; Peck 1990).

Even the adoption of the household as a unit of analysis, as some have proposed, does not free one from trying to deal with the role of individuals. It is becoming increasingly clear that households do not act as undifferentiated collectives but, rather, embody individuals who engage in complex negotiations. These negotiations embody cultural expectations, social rank, gender hierarchies, age, and other demographic considerations which shape the outcomes summarized as "household behavior" or "decisions". Attention to the internal dynamics of households becomes necessary to understand the social relations of production, consumption, and distribution—although this may not be possible very often in archeological research, where "household" commonly refers to a "residential unit".

Problems of Boundary Definition

Just as the time dimension was long overlooked, so was attention to the criteria for boundary definition. The common wisdom was that the ecosystem was a flexible unit and that the boundaries were determined by the goals of the investigator. Any unit which provides the empirical conditions for defining a boundary may constitute an ecosystem for analytical purposes. However, most human ecosystems do not have the clear-cut boundaries that a brook, a pond, or an island offers.

Rappaport (1967) defined the boundaries of the ecosystem he studied by using the concept of "territoriality." The Tsembaga Maring of New Guinea, as horticulturalists and as the ecologically dominant species, defined what the ecosystem, or territory, was

through their regulatory operations (Rappaport 1967:148). This is a basically satisfying solution to the question of boundary definition except for two implicit problems: how do ecosystem boundaries change through time and how do shifts in boundary definition relate to internal and external structural or functional relations?

One of the most important steps in dealing with this problem is the identification of inputs and outputs and their measurement. Input/output analysis reveals the status of the system defined for investigation, indicates the system's storage capacity, its resilience to external variation in input, and helps identify structural changes likely to occur. The input/output fluxes of the whole system have specific properties which cannot be anticipated by investigating the system's component parts regardless of their importance (Schulze and Zwölfer 1987:8). Thus, the central problem of input/output analysis is the definition of the system's boundaries in space and time. The scale chosen will depend on the type of process under consideration. In some cases the system will be defined by the material cycles, in others by energy fluxes, in others by historical boundaries in terms of people-vegetation-abiotic interactions. Contemporary conservation and restoration biologists define ecosystems as having integral and degraded patches and attempt to restore degraded patches in terms of the input/output relations that characterize the undegraded, or integral, parts of the ecosystem in question (Jordan 1987). This notion does not assume ecosystem equilibrium or a naive notion of reconstructing an "ideal climax" condition. Instead, it seeks to return the system to some degree of structural integrity and replication of functional interrelations, although the actual species composition, and the "details" of the system may be quite different from any of its earlier states (Allen 1988; Berger 1990).

Bounding one's research is an ever present challenge to be faced by both biologists and anthropologists. By assuming that ecosystems are purely and subjectively definable, yet also somehow coterminous with biomes and other biogeographical units, creates real problems in defining clear sampling criteria. Environmental "patchiness" and heterogeneity, animal mobility, and massive ecosystem change due to natural and man-made disasters have received little attention as they affect one's sample population, for example. There has been progress in this regard. Clearly, time, space, and hierarchical level all need to be accounted for in ecological analysis.

Level and Scale Shifting

Whereas it is normal and quite common to understand one level of analysis in terms of the other, such a tack may not be appropriate. Indeed, this may be the most serious limitation of the ecosystem approach—although it has been rarely mentioned by the critics. All we have for most macro-ecosystems is data for a few sites, for a limited time period, and on only some aspects of the whole system of interactions. From an analytic perspective, one cannot confidently use site-specific studies as a basis for macro-ecosystem models. Geographers, of all scientists, have shown the most sensitivity to this constraint, particularly in reference to how one can understand a large region while only studying small areas within it (McCarthy *et al.* 1956; Dogan and Rokkam 1960).

Biologists and anthropologists deal with systems of very different scales in space and time. Commonly, biologists focus on particular components of ecosystems rather than on the whole system. The spatial scale can go from a few square kilometers to a whole watershed. Nevertheless, regardless of scale, the diversity and complexity of the system has to be reduced to a manageable model of the system, if analysis of the ecosystem is desired. On the other hand, if processes are to be understood, the reverse process is called for: isolating that process from the other system processes. The dilemma between the reductionist view of single processes and the deductivist view of systems is a persistent one—although ultimately both approaches are necessary (Schulze and Zwölfer 1987:3). In addition, the stochasticity of many environmental parameters, such as rainfall and temperature, makes predictive models of uncertain accuracy.

Anthropologists and ecologists have shown less caution about the problems posed by scale and level shifting. Odum (1971) provides few cautionary words about the pitfalls of extrapolating evidence from single sites to macro-systems. Current trends in both ecology and anthropology suggest that the macro-ecosystem level may not be appropriate for dealing with questions of human impact and resource management except in very broad terms, like "seeking that industrial nations reduce CFC emissions by 20% by the year 2000." This global approach to environment is necessary, given that the problems posed by industrial emissions cut across national boundaries and require concerted, or global, agreement on what each nation will do to combat the problem (National Science Board 1989). On the other hand, it would be a mistake to think that resource management will be adequately addressed by these broad policies. Resource management is ultimately a site-specific task in which social, political, legal, and historical dimensions are at least as important as environmental ones. Local actions have global consequences when they converge in given directions, but corrective actions have to deal with the motives for the actions of individuals who act rationally, within the incentives and experience within which they live. This is a very exciting arena to which ecological anthropologists could have much to contribute in the decades ahead, if they embrace multidisciplinarity (Dahlberg and Bennett 1986).

NOTES

1. Although the term "cognized environment" was introduced later, it is accurate in describing Steward's notion of "selected features of an environment of greatest relevance to a population's subsistence."

2. Energy flow analysis refers to methods that attempt to measure the chemical transformation of solar energy into biomass and its gradual diffusion and loss through a food web (cf. Odum 1971; Moran 1982).

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Gender and the Environment
A Feminist Political Ecology Perspective

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The convergence of interest in environment, gender, and development has emerged under conditions of rapid restructuring of economies, ecologies, cultures, and polities from global to local levels. Global economic, political, and environmental changes have affected both men and women as stakeholders and actors in resource use and allocation, environmental management, and the creation of environmental norms of health and well-being. Some scholars and activists see no gender differences in the ways human beings relate to the environment, except as they are affected by the constraints imposed by inequitable political and economic structures. Others see the gendered experience of environment as a major difference rooted in biology. We suggest that there are *real*, not imagined, gender differences in experiences of, responsibilities for, and interests in "nature" and environments, but that these differences are not rooted in biology per se. Rather, they derive from the social interpretation of biology and social constructs of gender, which vary by culture, class, race, and place and are subject to individual and social change.

In this volume, we explore the significance of these differences and the ways in which various movements, scholars, and institutions have dealt with gendered perspectives on environmental problems, concerns, and solutions. The major schools of feminist scholarship and activism on the environment can be described as:

1. ecofeminist;
2. feminist environmentalist;
3. socialist feminist;
4. feminist poststructuralist; and
5. environmentalist.

Ecofeminists posit a close connection between women and nature based on a shared history of oppression by patriarchal institutions and dominant Western culture, as

well as a positive identification by women with nature. Some ecofeminists attribute this connection to intrinsic biological attributes (an essentialist position), while others see the women/nature affinity as a social construct to be embraced and fostered (Plumwood 1993; Merchant 1981, 1989; King 1989; Shiva 1989; Mies and Shiva 1994; Rocheleau 1995). Feminist environmentalism as articulated by Bina Agarwal (1991) emphasizes gendered interests in particular resources and ecological processes on the basis of materially distinct daily work and responsibilities (Seager 1993; Hynes 1989). Socialist feminists have focused on the incorporation of gender into political economy, using concepts of production and reproduction to delineate men's and women's roles in economic systems. They identify both women and environment with reproductive roles in economies of uneven development (Deere and De Leon 1987; Sen and Grown 1987; Sen 1994) and take issue with ecofeminists over biologically based portrayals of women as nurturers (Jackson 1993a and b). Feminist poststructuralists explain gendered experience of environment as a manifestation of situated knowledges that are shaped by many dimensions of identity and difference, including gender, race, class, ethnicity, and age, among others (Haraway 1991; Harding 1986; Mohanty 1991). This perspective is informed by feminist critiques of science (Haraway 1989; Harding 1991) as well as poststructural critiques of development (Escobar 1995; Sachs 1992) and embraces complexity to clarify the relation between gender, environment, and development. Finally, many environmentalists have begun to deal with gender within a liberal feminist perspective to treat women as both participants and partners in environmental protection and conservation programs (Bramble 1992; Bath 1995).

We draw on these views of gender and environment to elaborate a new conceptual framework, which we call feminist political ecology. It links some of the insights of feminist cultural ecology (Fortmann 1988; Hoskins 1988; Rocheleau 1988a and b; Leach 1994; Croll and Parkin 1993) and political ecology (Schmink and Wood 1987, 1992; Thrupp 1989; Carney 1993; Peet and Watts 1993; Blaikie and Brookfield 1987; Schroeder 1993; Jarosz 1993; Pulido 1991; Bruce, Fortmann, and Nhira 1993) with those of feminist geography (Fitzsimmons 1986; Pratt and Hanson 1994; Hartmann 1994; Katz and Monk 1993a and b; Momsen 1993a and b; Townsend 1995) and feminist political economy (Stamp 1989; Agarwal 1995; Arizpe 1993; Arizpe, Stone, and Major 1993; Thomas-Slayter 1992; Joekes 1995; Jackson 1985, 1995; Mackenzie 1995). This approach begins with the concern of the political ecologists who emphasize decision-making processes and the social, political, and economic context that shapes environmental policies and practices. Political ecologists have focused largely on the uneven distribution of access to and control over resources on the basis of class and ethnicity (Peet and Watts 1993). Feminist political ecology treats gender as a critical variable in shaping resource access and control, interacting with class, caste, race, culture, and ethnicity to shape processes of ecological change, the struggle of men and women to sustain ecologically viable livelihoods, and the prospects of any community for "sustainable development."

The analytical framework presented here brings a feminist perspective to political ecology. It seeks to understand and interpret local experience in the context of global processes of environmental and economic change. We begin by joining three critical

themes. The first is *gendered knowledge* as it is reflected in an emerging "science of survival" that encompasses the creation, maintenance, and protection of healthy environments at home, at work, and in regional ecosystems. Second, we consider *gendered environmental rights and responsibilities*, including property, resources, space, and all the variations of legal and customary rights that are "gendered." Our third theme is *gendered environmental politics and grassroots activism*. The recent surge in women's involvement in collective struggles over natural resource and environmental issues is contributing to a redefinition of their identities, the meaning of gender, and the nature of environmental problems.

Several common threads have run throughout the scholarship and the movements that address the convergence of gender, science, and environment, but common concerns have often been obscured by the distinct discourses of resistance, critique, and alternative practice. We draw the following points into a common perspective and the authors pursue each of them in the case studies, as appropriate:

1. Women's multiple roles as producers, reproducers, and "consumers" have required women to develop and maintain their integrative abilities to deal with complex systems of household, community, and landscape and have often brought them into conflict with specialized sciences that focus on only one of these domains. The conflict revolves around the separation of domains of knowledge, as well as the separation of knowing and doing, and of "formal" and "informal" knowledge.

2. While women throughout the world under various political and economic systems are to some extent involved in commercial activities (Berry 1989; Jackson 1985), they are often responsible for providing or managing the fundamental necessities of daily life (food, water, fuel, clothing) and are most often those charged with healthcare, cleaning, and childcare in the home, if not at the community level (Moser 1989). This responsibility puts women in a position to oppose threats to health, life, and vital subsistence resources, regardless of economic incentives, and to view environmental issues from the perspective of the home, as well as that of personal and family health. This does not preclude women from engaging in economic interests, but suggests that they will almost always be influenced by responsibilities for home, health—and in many cases—basic subsistence.

3. Both health and ecology are amenable to feminist and alternative approaches to practice since they do not necessarily require special instrumentation, but rather focus on the "objects" and experience of everyday life, much of which is available through direct observation (Levins 1989). While some aspects of health and ecology have become highly technical, there is much new insight and information to contribute to these disciplines that is still available to observation without specialized instruments beyond the reach of ordinary folk. There is also scope for a feminist practice of ecology that uses specialized tools differently and for different ends.

4. While formal science relies heavily on fragmentation, replication, abstraction, and quantification (Levins 1989), many women have cited the importance of integration and a more holistic approach to environmental and health issues (Candib 1995). Feminist scholars have shown that some women researchers in professional sciences have used distinct approaches based on skills acquired in their socialization as women (Keller 1984; Hynes 1989, 1991, 1992). On a more personal and everyday level, some

grassroots women's groups have explicitly stated that "our first environment is our bodies" (Gita Sen, personal communication), calling for a more integrative approach to health, environment, and family planning in development, welfare, and environmental programs.

5. Most feminist or women's environmental movements have incorporated some or all of the elements of the feminist critique of science as summarized by Sandra Harding (1987). The five classes of critique address:

1. inequity of participation and power in science-as-usual;
2. abuse and misuse of science on and about women;
3. assumptions of value-free objectivity and universality in science;
4. use of culturally embedded, gendered metaphors in scientific explanation and interpretation; and
5. development of alternative ways of knowing and ways of learning based on everyday life, women's experience, and explicit statement of values.

Feminist political ecology addresses the convergence of gender, science, and environment in academic and political discourse as well as in everyday life and in the social movements that have brought new focus to this issue.

These sciences occur in several forms, from local environmental knowledge (for example, which plants can cure us and how we can protect them), to recent innovations (new techniques to manage soil, water, and trees; new ways to diagnose exposure to toxic chemicals), to research on the unknown (what is making us sick; or how we can maintain our forest plants in a changing landscape). These various sciences are practiced by diverse groups from rural herbalists and forest farmers to suburban residents, professional nurses, environmental engineers and urban residents and factory workers. While there are many other axes of difference that may shape peoples' experience and understanding of "environment" and their sciences of ecology, feminist political ecology focuses on gender, while including discussions of interactions with class, race, age, ethnicity, and nationality.

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A View from a Point
Ethnoecology as Situated Knowledge

Virginia D. Nazarea

In 1954, Harold Conklin wrote his dissertation on "The Relation of the Hanunuo Culture to the Plant World." In the same year, he introduced what he called "the ethnoecological approach" in a seminal paper that was to dismantle the dominant view on shifting cultivation as a haphazard, destructive, and primitive way of making a living. What came after, from the midfifties to the midseventies, was a testimony to the power of the idea that Conklin had unleashed (for useful reviews, see Hunn 1989; Ford 1978; Fowler 1977; Toledo 1992). The prefix "ethno" came to denote not merely a localized application of a branch of study (for example, ethnobotany as the botany of a local group from an outsider's—that is, an investigator's—perspective) but also, following the works of Conklin (1954, 1961), Goodenough (1957), Frake (1962), Sturtevant (1964), and many others, a serious attempt toward the understanding of local understanding (the so-called native point of view) about a realm of experience. An explosion of research papers, not to mention entire programs at prestigious universities, systematically documented and analyzed folk classification and paradigms pertaining to plants, animals, firewood, soils, water, illness, and the human body until only the most incorrigible could remain unimpressed by the logic, complexity, and sophistication of local knowledge.

Anthropologists and nonanthropologists alike could not stop marveling at why, to use Brent Berlin's phrase (1992:5), "non-literates 'know so much' about nature." This sense of amazement and perplexity has been pursued, broadly speaking, in two different directions. One, as exemplified by Conklin's original conception of ethnoecology, is to demonstrate Western scientific ignorance about other peoples' ways of thinking and doing, and to point out its arrogance in dismissing anything that is different as being inferior. The other, as exemplified by the methodical investigation of Tzeltal ethnobotany by Berlin, Breedlove, and Raven (1974) is to cross-refer native systems of classification to the Western scientific tradition—in this case, the Linnaean taxonomic system—and to demonstrate how native systems virtually match scientific taxonomies rank by rank, category by category.

Both approaches led to a qualitative leap in the way local knowledge is regarded, causing a radical shift in mindset from viewing native systems of thought as naive and rudimentary, even savage, to a recognition that local cultures know their plant, animal, and physical resources intimately and are expert at juggling their options for meeting day-to-day requirements and making the most of ephemeral opportunities. Ethnoscience introduced a methodological rigor and theoretical depth that had been quite unknown in past cataloguing of the local uses of biological resources. There is a difference between the two approaches, however, if not by intent then at least by implication. I would argue that the first approach places value on local knowledge by reference to its internal coherence and its environmental and sociocultural adaptiveness. In contrast, the second approach strives to demonstrate the primacy of perceptual universals in determining patterns of classification. In so doing, it subjects local knowledge to a test of legitimacy by measuring it against Western systems of classification and downplaying its adaptability to varying environmental demands and cultural dimensions that have shaped, and continue to shape, its many formulations.

The distinction between these two trajectories is not petty, and the problem needs to be discussed because of contemporary concerns about the representation of local knowledge and related issues of authorship, access, and control. These issues inform, or should inform, national, regional, and international negotiations about biodiversity and the commons and about self-determination and intellectual property rights, as well as our understanding of humans-in-environment. Gone are the simpler days when anthropologists could refer to their fieldwork sites as "my village" and speak authoritatively about "my people," or use Western systems of thought as the yardstick for everything that is good and beautiful and true. As Gary Lease (1995:5) perceptively noted:

> In our post-modern, post-Marxist world, class struggles no longer have anything to do with "truth," with "right" and "wrong," but rather only with the most profound level of ideological battles. … Such contests never result in victory, in completion, in closure. We will not "get the story right," regardless of the tendency of some scientists to proclaim final triumph. … Our many representations of nature and human are, in other words, always and ultimately flawed. … This, in turn, underlines the role of *power* in the contestation over what gets to count in any ruling narrative, and who gets to tell it.

There is another, related level in which the debate has been pursued, this time more openly. This concerns the question about whether systems of classification are intellectually driven, a natural pan-human response to being confronted by the chaos (Lévi-Strauss 1966) or the chunks of biological diversity (Berlin, Breedlove, and Raven 1974), or motivated primarily by the utilitarian concerns of human beings as biological entities themselves who need to eat, sleep, keep warm, seek shelter, defend their plots, heal, and reproduce (Hunn 1982). Berlin made his position clear:

> One is not able to look out on the landscape of organic beings and organize them into cultural categories that are, at base, inconsistent with biological reality. The world of nature cannot be viewed as a continuum from which pieces may be selected ad libitum and organized into arbitrary cultural categories. Rather, groups of plants and animals present

themselves to the human observer as a series of discontinuities whose structure and content are seen by all human beings in essentially the same ways, perceptual givens that are largely immune from the variable cultural determinants found in other areas of human experience. (1992:8–9)

As a counterpoint, Hunn's observation about the striking difference between the minimal classificatory effort directed by the Tzeltal to adult butterflies that do not significantly affect their livelihood, and the considerable attention—resulting in more complicated classificatory schemes—they devote to caterpillars that do, indicates that in fact other areas of human experience impact classification in quite significant and interesting ways (Hunn 1982).

Distinct, but in close affinity to the second position, is the emphasis on cultural relations that shape classifications—an argument espoused, for example, by Ellen (1993)—that also questions the disembodied universalist, intellectualist stance. In explaining his position, Ellen wrote:

My own intellectual socialization within the British tradition of social anthropology had brought with it an empirical and sociological bias which militated against an approach which seemed to me to reduce "mundane" classifications to narrow intellectual conundrums to be solved through the application of formal mathematical, logical, and linguistic procedures, or which relegated their analysis to comparative and evolutionary speculation about general mental principles of classification or cognition. … Without denying the importance of these matters, my main theoretical concern has been with classifications as situationally adapted and dynamic devices of practical importance to their users, reflecting an interaction—though in a by no means self-evident way—between culture, psychology, and discontinuities in the concrete world; a lexical and semantic field firmly embedded in a wider context of beliefs and social practices. (1993:3)

My purpose in organizing the conference entitled "Ethnoecology: Different Takes and Emergent Properties," was not to add yet another dissenting voice to this venerable debate. To my mind, the main protagonists in this debate are trying to answer different questions, and, although much has been accomplished in extolling local knowledge and paying respect to its authors, an inordinate amount of energy has already been devoted to arguing for the best possible answer—to "get the story right" once and for all—to sets of questions that are fundamentally different to start with. Berlin has focused his efforts on elucidating universals based on his premise that ethnobiological classification is perceptually driven, while Hunn, Ellen, and others are more concerned with how culture shapes cognition and mediates behavior. There is no reason why human beings cannot operate at both levels sequentially or even simultaneously, as, I think, perhaps they do. In the meantime, we may be missing the opportunity to move on and pursue other interesting directions, to connect intellectually with exciting dialogues within and outside anthropology, and to address real world concerns that are larger than our limited, albeit intense, paradigms.

I believe it is time to reorient the conversation to focus on an important dimension that has largely been missed, a problem with which ethnoecology has great potential for productive engagement, both at the theoretical and at the applied level. I refer to

the connection between plant classification, for example, and conservation of plant genetic resources, or between cultural conceptions of landscape and management of the commons. In short, it is time to turn our attention to the interface between cognition and action—or decision-making frameworks and behavioral outcomes—and the lenses and latitudes that shape and structure these interconnections. We can only begin to tackle this problem, however, if we shift our attention from relations of similarity or paradigmatic alliances captured by our neat but static taxonomic trees to relations of contiguity embracing both syntagmatic and diachronic flow.

In an earlier conceptual paper, Hunn (1989:147) referred to this distinction as the Image vis-à-vis the Plan and noted that while "cognitive anthropologists have made substantial progress in the analysis of cultural Image, of Image domains such as color, kinship relations, folk biological taxonomies, and folk anatomy … what is lacking is an effective integration of our models of Image and of Plan." Such integration would enable us to link categories to strategies and decipher the "action plans" and "activity signatures" (Randall and Hunn 1984) embedded in each category—a crucial step in understanding the role of local knowledge in human-environment interaction. We may also recall that while Conklin applied linguistic analysis to the service of describing spheres of local knowledge or semantic domains, he never lost sight of linkages between cognition, decision making, and action, or the embeddedness of ethnoecological systems in the environmental and cultural matrix. Discussing the importance of the "cultural axis," for instance, Conklin emphasized that:

> Along the cultural axis, three distinctions are noted: technological, social, and ethnoecological. Technological factors refer to the ways in which the environment is artificially modified, including the treatment of crops, soils, pests, etc. In systems of shifting cultivation, these relationships are of primary importance and often exhibit great complexity; … Social factors involve the sociopolitical organization of the farming population in terms of residential, kin, and economic groups. These factors are usually well within the domain of anthropological interest. Ethnoecological factors refer to the ways in which environmental components and their interrelations are categorized and interpreted locally. Failure to cope with this aspect of cultural ecology, to distinguish clearly between native environmental categories (and associated beliefs) and those used by the ethnologist, can lead to confusion, misinformation, and the repetition of useless cliches in discussing unfamiliar systems of land use. (1961:60)

Incorporating contiguity and process as critical components of an engaged ethnoecology also moves us closer to a dynamic rather than monolithic ethnoecology that will admit the importance of ideological negotiation and positioning. No longer encumbered by the need to essentialize our native collaborators, or freeze their taxonomies—or artifacts thereof—in time and space, we can better appreciate how understanding is shaped by standing, as is disposition by position, in an internally differentiated hierarchy of social, economic, and political relations. We can weave into our analysis the history of asymmetric relations with reference to class, gender, and ethnicity, a history that is all too easy to forget if we confine our analysis to perceptual givens, but a history that cannot be finessed because it continues to shape the present. Current thinking in psychology supports the position that even perception is "intelligent"—that it is based on a mental template that incorporates experience and

socialization and makes the interpretation of what is perceived a nonmechanical, nonrandom process (Banks and Krajicek 1991). Since it is impossible to maintain that the formation of our mental templates occurs in a social vacuum, the "programming," in a qualified sense, of perception by constraints imposed by our social niche makes rods-and-cones determinism untenable. D. W. Meinig, a noted geographer, actually preceded the psychologists in articulating this insight:

> It will soon be apparent that even though we gather together and look in the same direction at the same instant, we will not—we cannot—see the same landscape. We may certainly agree that we will see many of the same elements—houses, roads, trees, hills—in such denominations as number, form, dimension, and color but such facts take on meaning only through association; they must be fitted together according to some coherent body of ideas. Thus we confront the central problem: any landscape is comprised not only of what lies before our eyes but what lies inside our heads. (1979:33)

Many individuals in ethnoecology and related disciplines address such questions as these: How are folk (and scientific) models shaped, and for what ends? Who defines niches for different groups? Why do cognitive maps vary? By what processes and means is knowledge "naturalized"? In other words, following Meinig, how does "what lies inside our heads" structure how we see and act upon "what lies before our eyes"? Ethnoecology, as the investigation of systems of perception, cognition, and the use of the natural environment, can no longer ignore the historical and political underpinnings of the representational and directive aspects of culture, nor turn away from issues of distribution, access, and power that shape knowledge systems and the resulting practices. In searching for answers and directions, we are guided by Bourdieu's admonition that the social scientist cannot operate under the illusion that he or she can ever hope to produce "an account of accounts," since: "In reality, agents are both classified and classifiers. But they classify according to (or depending upon) their position within classifications. To sum up what I mean by this, I can comment briefly on the notion of point of view: the point of view is a perspective, a partial, subjective vision. … But it is at the same time a view, a perspective, taken from a point, from a determinate position in an objective social space (1987:2)."

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The New Ecological Anthropology

Conrad P. Kottak

Ecological anthropology was named as such during the 1960s, but it has many ancestors, including Daryll Forde, Alfred Kroeber, and, especially, Julian Steward. Steward's cultural ecology influenced the ecological anthropology of Roy Rappaport and Andrew P. Vayda, but the analytic unit shifted from "culture" to the ecological population, which was seen as using culture as a means (the primary means) of adaptation to environments. Columbia University can be identified as the birthplace of ecological anthropology and the related cultural materialism of Marvin Harris, which, however, drew as much on Steward's concern with culture change (evolution) and culture core as on his cultural ecology. More diachronically and comparatively oriented, cultural materialism shared with ecological anthropology an interest in the adaptive functions of cultural phenomena, including religion (e.g., Rappaport's [1968] focus on ritual in the ecology of a New Guinea people and Harris's [1966, 1974] analysis of the adaptive, conservatory role of the Hindu doctrine of *ahimsa*, with special reference to the cultural ecology of India's sacred cattle).

The ecological anthropology of the 1960s was known for systems theory and negative feedback. Cultural practices were seen as optimizing human adaptation and maintaining undegraded ecosystems. Factors forcing us to rethink old assumptions today include population increase and high-tech-mediated transnational flows of people, commerce, organizations, and information. The new ecological, or environmental, anthropology blends theory with political awareness and policy concerns. It attempts to understand and devise culturally informed solutions to such problems/issues as environmental degradation, environmental racism, and the role of the media, NGOs, and environmental hazards in stimulating ecological awareness and action. While recognizing that local and regional systems are permeable, the new ecological anthropology must be careful not to remove humans and their specific social and cultural forms from the analytic framework.

The following reviews the salient features of the old ecological anthropology, setting the stage for an exploration of important aspects of an emerging new ecological anthropology.

The Old Ecological Anthropology and Its Units of Analysis

The ecological anthropology of the 1960s was known for its functionalism, systems theory, and focus on negative feedback. Anthropologists examined the role of cultural practices and beliefs in enabling human populations to optimize their adaptations to their environments and in maintaining undegraded local and regional ecosystems. Various scholars (for example, Friedman 1974) attacked both ecological anthropology and cultural materialism for a series of presumed faults, including circular reasoning, preoccupation with stability rather than change and simple systems rather than complex ones, and Panglossian functionalism (the assumption that adaptation is optimal—creating the best of all possible worlds). Rappaport's distinction between cognized and operational models was related to ethnoscience, which grew out of linguistics but became another expression of the ecological anthropology of the 1960s. Flourishing at Stanford, Yale, Pennsylvania, and Berkeley, ethnoscience focused on cognized rather than operational models and on classification rather than action, and it received some of the same criticisms just mentioned for ecological anthropology.

The basic units of the ecological anthropology of the 1960s were the ecological population and the ecosystem, treated, at least for analytical purposes, as discrete and isolable units. The comparable unit for ethnoscience was the ethnosemantic domain (for example, ethnobotany, ethnozoology, ethnoforestry). Assumptions of the old ecological anthropology, now clearly problematic, are apparent in some of its key definitions—most importantly ecological population and ecosystem.

Rappaport defines an ecological population as "an aggregate of organisms having in common a set of distinctive means by which they maintain a common set of material relations within the ecosystem in which they participate" (1971a:238). Several elements of this definition must now be questioned. Given contemporary flows of people, information, and technology across cultural and social boundaries, how *distinctive* are the cultural adaptive means employed by any group? Given the fact and recognition of increased diversity within populations, how *common* is the set of material relations within ecosystems? Nor do most people today participate in only one ecosystem.

The New Ecological Anthropology

The differences between the old and the new ecological anthropology involve policy and value orientation, application, analytic unit, scale, and method. The studies in the old ecological anthropology pointed out that natives did a reasonable job of managing their resources and preserving their ecosystems (albeit through some rather unsavory means, including mortal combat and female infanticide); but those studies, relying on the norm of cultural relativism, generally aimed at being value-neutral. By contrast, the new ecological, or environmental, anthropology blends theory and analysis with political awareness and policy concerns. Accordingly, new subfields have emerged, such as applied ecological anthropology and political ecology (Greenberg and Park 1994).

We cannot be neutral scientists studying cognized and operational models of the environment and the role of humans in regulating its use when local communities and ecosystems are increasingly endangered by external agents. Many anthropologists have witnessed personally a threat to the people they study—commercial logging, environmental pollution, radioactivity, environmental racism and classism, ecocide, and the imposition of culturally insensitive external management systems on local ecosystems that the native inhabitants have managed adequately for centuries. Today's world is full of neocolonial actions and attitudes; outsiders claim or seize control over local ecosystems, taking actions that long-term residents may disdain. Concerned with proposing and evaluating policy, the new environmental anthropology attempts not only to understand but also to devise culturally informed and appropriate solutions to such problems and issues as environmental degradation, environmental racism, and the role of the media, NGOs, and various kinds of hazards in triggering ecological awareness, action, and sustainability.

The changes in ecological anthropology mirror more general changes in anthropology: the shift from research focusing on a single community or "culture," perceived as more or less isolated and unique, to recognizing pervasive linkages and concomitant flows of people, technology, images, and information, and to acknowledging the impact of differential power and status in the postmodern world on local entities. In the new ecological anthropology, everything is on a larger scale. The focus is no longer mainly the local ecosystem. The "outsiders" who impinge on local and regional ecosystems become key players in the analysis, as contact with external agents and agencies (for example, migrants, refugees, warriors, tourists, developers) has become commonplace. Ecological anthropologists must pay attention to the external organizations and forces (for example, governments, NGOs, businesses) now laying claim to local and regional ecosystems throughout the world. Even in remote places, ecosystem management now involves multiple levels.

Issues for the New Ecological Anthropology

One firm conclusion of the old ecological anthropology in all its guises (for example, the "ecological anthropology" of Rappaport and Vayda, the "cultural materialism" of Harris, and the "ethnoscience" of Berlin, Conklin, Frake, and Goodenough) was that indigenous groups have traditional ways of categorizing resources, regulating their use, and preserving the environment. An *ethnoecology* is any society's traditional set of environmental perceptions—that is, its cultural model of the environment and its relation to people and society. Today's world features a degree of political and economic interconnectedness unparalleled in global history. Local ethnoecologies are being challenged, transformed, and replaced. Migration, media, and industry spread people, institutions, values, and technologies. Imported values and practices often conflict with those of natives. In the context of population growth, migration, commercial expansion, and national and international incentives to degrade the environment, ethnoecological systems that have preserved local and regional environments for centuries are increasingly ineffective.

Ethnoecological Clashes: Developmentalism and Environmentalism. Challenging traditional ethnoecologies are two, originally Euro-American, ethnoecologies: developmentalism and environmentalism (Kottak and Costa 1993). These models enter myriad cultural settings, each of which has been shaped by particular national, regional, and local forces. Because different host communities have different histories and traditions, the impact of external forces is not universal or unidirectional. The spread of either developmentalism or environmentalism is always influenced by national, regional, and local ethnoecologies and their powers of adaptation and resistance.

Environmentalism entails a political and social concern with the depletion of natural resources (Bramwell 1989:3–6; Douglas and Wildavsky 1982:10–16). This concern has arisen with, and in opposition to, the expansion of a cultural model (developmentalism) shaped by the ideals of industrialism, progress, and (over)consumption (Barbour 1973; Pepper 1984). Environmental awareness is rising today as local groups adapt to new circumstances and to the models of developmentalism and environmentalism. Hazards created by development have been necessary conditions for the emergence of new perceptions of the environment. Environmental safeguards and conservation of scarce resources are important goals—from global, national, long-run, and even local perspectives. Still, ameliorative strategies must be implemented in the short run and in local communities. If traditional resources and products are to be destroyed, removed, or placed off limits (whether for development or conservation), they need to be replaced with culturally appropriate and satisfactory alternatives.

A new, possibly mediating, ethnoecological model—*sustainable development*—has emerged from recent encounters between local ethnoecologies and imported ethnoecologies, responding to changing circumstances. Sustainable development aims at culturally appropriate, ecologically sensitive, self-regenerating change. It thus mediates between the three models just discussed: traditional local ethnoecology, environmentalism, and developmentalism. "Sustainability" has become a mantra in the discourse surrounding the planning of conservation and development projects, but clear cases of successful sustainable development are few.

Issues addressed by the new ecological anthropology arise at the intersection of global, national, regional, and local systems, in a world characterized not only by clashing cultural models but also by failed states, regional wars, and increasing lawlessness. Local people, their landscapes, their ideas, their values, and their traditional management systems are being attacked from all sides. Outsiders attempt to remake native landscapes and cultures in their own image. The aim of many agricultural development projects, for example, seems to be to make the world as much like Iowa as possible, complete with mechanized farming and nuclear family ownership—despite the fact that these models may be inappropriate in settings outside the midwestern United States. Development projects often fail when they try to replace native forms with culturally alien property concepts and productive units (Kottak 1990).

A clash of cultures related to environmental change may occur when development threatens indigenous peoples and their environments. Native groups like the Kayapó of Brazil may be threatened by regional, national, and international development plans (such as a dam or commercially driven deforestation) that would destroy their homelands. A second clash of cultures related to environmental change occurs when

external regulation threatens indigenous peoples. Thus, native groups, such as the Tanosy of southeastern Madagascar, may be harmed by regional, national, and international environmental plans that seek to *save* their homelands. Sometimes outsiders expect local people to give up many of their customary economic and cultural activities without clear substitutes, alternatives, or incentives.

Consider the case of a Tanosy man living on the edge of the Andohahela reserve of southeastern Madagascar. For years he has relied on rice fields and grazing land inside the reserve. Now external agencies are telling him to abandon this land for the sake of conservation. This man is a wealthy *ombiasa* (traditional sorcerer-healer). With four wives, a dozen children, and twenty head of cattle, he is an ambitious, hard-working, and productive peasant. With money, social support, and supernatural authority, he is mounting effective resistance against the park ranger who has been trying to get him to abandon his fields. The ombiasa claims he has already relinquished some of his fields, but he is waiting for compensatory land. His most effective resistance has been supernatural. The death of the ranger's young son was attributed to the ombiasa's magical power. After that the ranger was less vigilant in his enforcement efforts.

Biodiversity Conservation. Biodiversity conservation has become an issue in political ecology, one of the subfields of the new ecological anthropology. Such conservation schemes may expose very different notions about the "rights" and value of plants and animals versus those of humans. In Madagascar, many intellectuals and officials are bothered that foreigners seem more concerned about lemurs and other endangered species than about Madagascar's people. As one colleague there remarked, "The next time you come to Madagascar, there'll be no more Malagasy. All the people will have starved to death, and a lemur will have to meet you at the airport."

On the other hand, accepting the idea that preserving global biodiversity is a worthwhile goal, one vexing role for applied ecological anthropology is to devise socially sensitive and culturally appropriate strategies for achieving biodiversity conservation—in the face of unrelenting population growth and commercial expansion. How does one get local people to support biodiversity conservation measures that may, in the short run at least, diminish their access to strategic and socially valued resources?

I am one of several anthropologists who have done social-soundness analysis for conservation and development projects. Such projects aim, in theory at least, at preserving natural resources and biodiversity while promoting human welfare through "development." My experience designing the social-soundness component of the SAVEM project (Sustainable and Viable Environmental Management), intended to preserve biodiversity in Madagascar, suggested that a gradual, sensitive, and site-specific strategy is most likely to succeed (Kottak 1990; Kottak and Costa 1993). Conservation policy can benefit from use of a flexible "learning process" model rather than a rigid "blueprint" strategy (Korten 1980; see also Kottak 1990). The approach I recommended for Madagascar involves listening to the affected people throughout the whole process in order to minimize damage to them. Local people (with at least some secondary education) were trained as "para-anthropologists" to monitor closely the perceptions and reactions of the indigenous people during the changes.

Ecological Awareness and Environmental Risk Perception. The "applied" ("engaged" in Rappaport's [1994] terms) role of today's ecological anthropologist may be as agent or advocate—planner and agent of policies aimed at environmental preservation or amelioration—or advocate for local people actually or potentially at risk through various forces and movements, including developmentalism and environmentalism. One research-and-development role for today's ecological anthropologist is to assess the extent and nature of ecological awareness and activity in various groups and to harness parts of native ethnoecological models to enhance environmental preservation and amelioration.

With Brazilian colleagues Alberto Costa and Rosane Prado, I have researched environmental risk perception and its relation to action at several sites in Brazil (Costa et al. 1995; Kottak and Costa 1993). Our assumption has been that, although people won't act to preserve the environment if they perceive no threats to it, risk perception does not guarantee action. Our research sought answers to several questions: How aware are people of environmental hazards? How do, can, and will they respond to them? Why do some people ignore evident hazards while other people respond to minor dangers with strong fears? How is risk *perception* related to *actions* that can reduce threats to the environment and to health? (For an American take on such questions, see Kempton et al. 1995.)

A key assumption underlying our Brazilian research is as follows: although the presence of an actual hazard increases risk perception, such perception does not arise inevitably through rational cost-benefit analysis of risk. Instead, risk perception emerges (or lags) in cultural, political, and economic contexts shaped by encounters among local ethnoecologies, imported ethnoecologies (often spread by the media), and changing circumstances (including population growth, migration, and industrial expansion).

Environmental awareness was especially evident in Brazil immediately before and after the Earth Summit or UNCED (the United Nations Conference on the Environment and Development), held in Rio de Janeiro in June 1992. Ecological awareness has been abetted by the media, particularly television—to which Brazil is well-exposed, with the world's most watched commercial television network, Globo. Brazilian environmentalism began to grow in the mid-1980s, reflecting the return of public debate along with democracy—*abertura*, the Brazilian *glasnost*, after two decades of military rule. Brazilian environmentalism, strongest in cities in the southcentral part of the country, is a growing political force, but with mainly urban support.

There is much less ecological awareness outside the main cities. A simple illustration comes from my own research in Arembepe (Bahia state), an Atlantic fishing town I have been studying since 1962 (Kottak 1999). Since the early 1970s, Arembepe has suffered air and water pollution from a nearby multinationally owned titanium dioxide factory. In three decades, Arembepe's municipal seat, Camaçari, has grown tenfold, from a sleepy rural town into a major industrial (petrochemical) center. Chemical pollution of the region's streams, rivers, and coastal waters now endangers wildlife and people.

Like others in their municipality, Arembepeiros face real and immediate hazards—industrial pollution of the air, fresh water, and the ocean. Several times, reporters

from the nearby metropolis of Salvador have covered the chemical pollution of Arembepe's coastal water and freshwater lagoons. Most villagers have seen those reports on TV. Still, local awareness of immediate environmental threats hasn't increased as rapidly as the hazards have. Thus, walking along the beach north of Arembepe one day in 1985, I passed dead sea gulls every few yards. There were hundreds of birds in all. I watched the birds glide feebly to the beach, where they set down and soon died. I was stunned and curious, but local people paid little attention to this matter. When I asked for explanations, people said simply "the birds are sick." Neither Arembepeiros nor scientists I spoke with in Salvador (who speculated about an oil spill or mercury poisoning) could provide a definitive explanation for the dead birds.

Although Brazilian environmental awareness has grown, media accounts have followed the international lead by focusing on the Amazon as *the* ecologically threatened region. Community-level data we have collected at several sites show that Amazonian deforestation is the nonlocal ecological issue most familiar to ordinary Brazilians. When they are asked about "ecology," most Brazilians mention the Amazon instead of hazards closer to home. But environmental threats with global implications (including deforestation) exist in many areas of Brazil besides the Amazon.

My research in Brazil and Madagascar convinces me that people won't act to preserve the environment (regardless of what environmentalists and policymakers tell them to do) if they perceive no threat to it. They must also have some good reason (for example, preserving irrigation water or a tax incentive) for taking action to reduce the environmental threat. They also need the means and the power to do so. Risk perception per se does not guarantee environmental organization and action.

NGOs and Rights Movements. The worldwide proliferation of nongovernmental organizations is a major trend in late-twentieth-century political organization. This proliferation merits the attention of the new ecological anthropology because so many NGOs have arisen around environmental and "rights" issues. Over the past decade, the allocation of international aid for "development" (including conservation as well as development) has systematically increased the share of funds awarded to NGOs, which have gained prominence as social change enablers.

In the "development community" (for example, the World Bank, USAID, UNDP [United Nations Development Programme]), it is widely assumed that a strategy of channeling funds to NGOs, PVOs (private voluntary organizations), and GROs (grass roots organizations) will maximize immediate benefits to community residents. NGOs are generally viewed as more responsive to local wishes and more effective in encouraging community participation than are authoritarian and totalitarian governments. However, this strategy is being increasingly criticized, especially in cases (for example, Madagascar) in which powerful, expatriate-staffed international NGOs are allowed to encroach on the regulatory authority of existing governments. There is a real issue of neocolonialism when it is assumed that NGOs with headquarters in Europe or North America are better representatives of the people than are their own elected governments, although certainly they may be.

The emergence and international spread of "rights" movements (human, cultural, animal) is also of interest to ecological anthropology. The idea of human rights

challenges the nation-state by invoking a realm of justice and morality beyond and superior to particular countries, cultures, and religions. Human rights are seen as inalienable (nation-states cannot abridge or terminate them) and metacultural (larger than and superior to individual nation-states). Cultural rights, on the other hand, apply to units *within* the state. Cultural rights are vested not in individuals but in identifiable groups, such as religious and ethnic minorities and indigenous societies. Cultural rights include a group's ability to preserve its culture, to raise its children in the ways of its forebears, to continue its language, and not to be deprived of its economic base (Greaves 1995:3). Greaves (1995) points out that because cultural rights are mainly uncodified, their realization must rely on the same mechanisms that create them—pressure, publicity, and politics. Such rights have been pushed by a wave of political assertiveness throughout the world, in which the media and NGOs have played a prominent part.

The notion of indigenous intellectual property rights (IPR) has arisen in an attempt to conserve each society's cultural base—its core beliefs and principles, including its ethnoecology. IPR is claimed as a group right—a cultural right, allowing indigenous groups to control who may know and use their collective knowledge and its applications. Much traditional cultural knowledge has commercial value. Examples include ethnomedicine (traditional medical knowledge and techniques), cosmetics, cultivated plants, foods, folklore, arts, crafts, songs, dances, costumes, and rituals. According to the IPR concept, a particular group may determine how indigenous knowledge and its products may be used and distributed and the level of compensation required.

Environmental Racism. The issues of interest to the new ecological anthropology are myriad, but a final one may be mentioned: environmental racism. This is a form of institutional discrimination in which programs, policies, and institutional arrangements deny equal rights and opportunities to, or differentially harm, members of particular groups. Bunyan Bryant and Paul Mohai define environmental racism as "the systematic use of institutionally-based power by whites to formulate policy decisions that will lead to the disproportionate burden of environmental hazards in minority communities" (1991:4). Thus, toxic waste dumps tend to be located in areas with non-white populations.

Environmental racism is discriminatory but not always intentional. Sometimes toxic wastes *are* deliberately dumped in areas the residents of which are considered unlikely to protest (because they are poor, powerless, "disorganized," or "uneducated"). (This is why a polluting titanium dioxide factory was placed near my Brazilian field site of Arembepe rather than in an area having more political clout [see Kottak 1999].) In other cases property values fall after toxic waste sites are located in an area. The wealthier people move out, and poorer people, often minorities, move in, to suffer the consequences of living in a hazardous environment.

Methodology in the New Ecological Anthropology

The new ecological anthropology can draw on a series of high-tech research methods. Satellite imagery (deployed synchronically or diachronically) has been used to locate ecological hotspots (e.g., areas of deforestation or pollution), which have then been investigated on the ground by multidisciplinary teams (see Green and Sussman 1990; Kottak et al. 1994; Sussman et al. 1994). GIS (geographical information systems) and other approaches may be used to map various kinds of data on human and environmental features (see Sponsel et al. 1994). Macroscope software, developed by J. Stephen Lansing and others, facilitates the mapping—on a computer screen—of various kinds of information, such as yields in Balinese fields in relation to pest damage and farming practices. Survey data can be collected across space and time and compared. However, the availability of such high-tech methods should not seduce us away from anthropology's characteristic focus on people. Ethnographic research in varied locales helps us discover relevant questions, which some of the techniques just mentioned can help us answer. The new ecological anthropology can use high-tech methods, while taking care not to let electronic dazzle divert attention from direct, firsthand ethnographic study of people and their lives.

Also relevant to the new ecological anthropology is linkages methodology, as elaborated by Kottak and Colson (1994). As Elizabeth Colson and I have pointed out, anthropologists are increasingly developing models of their subject matter that are isomorphic with the structure of the modern world, including the various regional, national, and international linkages within it. We use the term *linkages methodology* to describe various recent multilevel, multisite, multitime research projects. A definition of linkages in relation to research methodology and content was the goal of a working group of anthropologists who first met in 1986.[1] All of us were concerned with the impact of international and national forces, including development projects, on our research locales. Most members of the Linkages Group (as we called ourselves) had worked more than once in the same region. We knew the advantages of observing how people respond to different opportunities and perturbations at various stages of their lives.

We recognized the value of research samples (both communities and mobile individuals) that could be followed through time. What kinds of links did they have with others, including external agencies? This line of inquiry entailed a census approach, a network approach (to trace relationships associated with geographical mobility and external interventions), plus survey and ethnographic techniques. The linkages approach to change also required attention to the roles of governmental and nongovernmental organizations, and of changes in marketing, transportation, and communication systems.

One method of linkages research is to study a site or sites over time. Another is systematic intercommunity comparison, requiring multiple sites that are chosen because they vary with respect to key criteria. These sites can be drawn from the same region, and the data collected would be part of the same study. They can also be from different regions (even different countries), if anthropologists can provide minimum core data (Epstein 1978:220) to make comparison possible. Linkages research extends to the

levels at which policies are worked out, examining archives and official records and interviewing planners, administrators, and others who impinge on the study population(s). The aim of linkages methodology is to link changes at the local level to those in regional, national, and world systems.

Linkages research is planned as an ongoing process requiring teamwork. Time and personnel are needed to follow a dispersing population, to study different sites, to interview at many levels, to explore archives and records, and to do follow-up studies. Involvement of host country colleagues, including local assistants and other community residents, is a key to continuity. Thus, *linkages* also refers to cooperation by people with common research interests in the effort to generate a fund of data.

One example of linkages methodology is the research I directed in Brazil on industrialization and commercial expansion, focusing on environmental hazards and risk perception. The investigation proceeded at two levels: (1) national—Brazil as a whole, where the government introduced a policy of industrialization in the early 1950s, and (2) local—across a range of sites differently exposed to risks (Costa et al. 1995; Kottak and Costa 1993). The field research design was systematic intercommunity comparison (based on quantitative and qualitative data). This methodology adds an analytic level to traditional "risk analysis," which studies populations *directly exposed* to environmental hazards like nuclear repositories. Given *that* research design, public reactions to a threat are inevitably interpreted within a stimulus-response framework (a threat causes certain responses). By contrast, our design assumed that variation in environmental awareness and risk perception could be most accurately understood by studying a range of sites differentially exposed to hazards. Comparison is essential. Any approach limited to endangered groups can't help but see risk perception mainly in response to an immediate stimulus. (For other linkages projects, see Kottak and Colson 1994.)

The linkages approach agrees with world system theory that much of what goes on in the world today is beyond anthropology's established conceptual and methodological tools. Traditional ethnography, based on village interviews and participant-observation, assumed that informants knew what was going on in that delimited space. Today, however, no set of informants can supply all the information we seek. Local people may not be helpless victims of the world system, but they cannot fully understand all the relationships and processes affecting them.

Not just the old ecological anthropology but traditional ethnography in general also propagated the illusion of isolated, independent, pristine groups. By contrast, the linkages approach emphasizes the embeddedness of communities in multiple systems of different scale. Linkages research combines multilevel (international, national, regional, local) analysis, systematic comparison, and longitudinal study (using modern information technology). Challenging the tradition of the lone ethnographer, linkages methodology develops large-scale, explicitly comparative *team projects* (ideally involving international research collaboration).

In Conclusion—Romer's Rule

The paleontologist A. S. Romer (1960) developed the rule that now bears his name to explain the evolution of land-dwelling vertebrates from fish. The ancestors of land animals lived in pools of water that dried up seasonally. Fins evolved into legs to enable those animals to get back to water when particular pools dried up. Thus, an innovation (legs) that later proved essential to land life originated to maintain life in the water. Romer's lesson—important for both the old and the new ecological anthropology—is that an innovation that evolves to *maintain* a system can play a major role in *changing* that system. Evolution occurs in increments. Systems take a series of small steps to maintain themselves, and they gradually change. Rappaport recognized Romer's lesson in his definition of adaptation: "the processes by which organisms or groups of organisms maintain *homeostasis* in and among themselves in the face of both short-term environmental fluctuations and long-term changes in the composition and structure of their environments" (Rappaport 1971b:23–24, emphasis added).

Romer's rule can be applied to development, which, after all, is a process of (planned) socioeconomic evolution. Applying Romer's rule to development, and here especially to ecologically oriented initiatives, we would expect people to resist projects that require major changes in their daily lives, especially ones that interfere with subsistence pursuits. People usually want to change just enough to keep what they have. Motives for modifying behavior come from the traditional culture and the small concerns of ordinary life. Peasants' values are not such abstract ones as "learning a better way," "increasing technical know-how," "conserving biodiversity," or "making the world safe for democracy." (Those phrases exemplify intervention philosophy.) Instead, their objectives are down-to-earth and specific ones. People want to improve yields in a rice field, amass resources for a ceremony, get a child through school, or be able to pay taxes. The goals and values of subsistence producers may at times differ from those of people who produce for cash, just as they differ from the intervention philosophy of development planners. Different value systems must be considered during planning.

This is one more way of saying that (ecological) anthropologists should not forget culture and people as they grapple with complexity, comparison, and change. Change always proceeds in the face of prior structures (a given sociocultural heritage). The direction and nature of change is always affected by the organizational material (sociocultural patterns) at hand when the change begins. Thus, cultural ways cannot be regarded as blank checks on which the environment, or history, can freely and mechanically write.

NOTES

1. This perspective was formalized at two Wenner-Gren supported conferences organized by Douglas White and held in La Jolla, California, in 1986. Participants, who became founding members of Linkages: The World Development Research Council, included Lilyan Brudner-White, Michael Burton, Elizabeth Colson, Scarlett Epstein, Nancie Gonzalez, David Gregory, Conrad Kottak, Thayer Scudder, and Douglas White.

Linkages' goals include assisting in organizing and coordinating basic scientific research on development on a worldwide basis. This includes formulation of theory, testing of hypotheses, development of appropriate databanks for testing theoretical formulations, monitoring change, establishing trends, and identifying specific linkages or mechanisms involved in social change, including development interventions.

A crucial vehicle for development research, including study of both spontaneous and planned social change, is the systematic integration of data from longitudinal field sites. Such sites allow analysis and evaluation of long-term trends and effects, including cyclical changes relating to human populations and their ecologies, including the ecology of world systems and networks.

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Normative Behavior

I. G. Simmons

Concerns and Principles

The first questions which ethicists and philosophers find it necessary to tackle seem to be (a) can we talk of environmental ethics at all? and (b) is it possible to talk in the aggregate or must there be a break-down into subsets of concern?[1] Some begin with an **ontological** argument[2] which takes the form of asserting that it is the duty of humans to promote or preserve the existence of good. The environment, whether as beauty or resources, is part of that good and its existence is physically contingent upon the continued existence of its components and its history, neither of which humans ought to disrupt.[3]

Further consideration reveals that there are (at least) two possible meanings of 'environmental ethics' to be discussed. They are:

1. The idea of an ethic for the **use of the environment**, i.e. a position which starts empirically from where we are, accepting the dominant world-view that the Earth is a set of resources which humanity is free to employ, even if some of them are employed in their entirety as aesthetic and recreational resources rather than simply as materials. The words 'utilitarian' and 'instrumental' are often used of such an attitude.
2. The idea of an ethic **of the environment** in which the moral standing of the non-human entities of the cosmos are given equal value with the human species. There is a 'weak' version in which at the very least this standing must be extended to all conscious beings and some non-conscious entities as well.

The first of these is well established and can be encapsulated by the term 'wise use'; the science of ecology has been harnessed since the 1960s as a hitching-rail for a management ethic for the human use of the Earth.[4] But another abstract element in the area management ethics must be our duty to future generations of humans. As yet unborn, they have no voice in our current preoccupations.[5] Normative behaviour, then, addresses itself to how much we should worry about the welfare of those to

come: should we refrain from using non-renewable resources (like fossil fuels) now so that this patrimony is not denied to our descendants? Or would we benefit later generations most by turning all these resources into knowledge of how to do without them?

The second viewpoint is the more difficult in both abstract and practical terms. The idea of intrinsic or inherent goodness (and hence of moral equality with humans) has rested primarily upon the presence of value independent of the presence of any conscious being: the value resides in the object itself and is not conferred upon it from 'outside', rather in the manner of an Honorary Degree.[6] For humans, then, the fitting attitude is one of admiring respect coupled with the realisation that the environment is not merely a means to human ends. The espousal of such an attitude would not have seemed strange in the Middle Ages, but has been largely submerged or dissolved since the Renaissance and the Enlightenment by the narrow focus of humans upon humans.

The current notion of inherent value assumes, however, the kind of distinction between subject and object that we associate with René Descartes. But one of the major consequences of the findings of quantum mechanics during the twentieth century has been that such a differentiation cannot be made. At the fundamentals of matter, what can be said about a particle in terms of its velocity and location are to some degree chosen for it by the observer: she or he may choose to know the particle's position definitely *or* its velocity definitely or both approximately. Location and velocity are, as Callicott puts it,[7] potential properties of an electron variously actualised in different experiments. Any attribution of value, therefore, has to be focused on neither the subjective nor the objective: if categories are needed, they must transcend the old dichotomies. Further, it can be argued that the universe consists of just one substance— spacetime—which is 'self-realising', and which must therefore be an ultimate source of value.[8] Above the underground rings of the particulate world, the extension of such ideas means perhaps that the essential unit of the world is the identification between self and world; the human self is a temporary knot in a web of life and non-life, rather as a particle seems to be a temporary manifestation of energy. So nature is intrinsically valuable to the same extent that the self is valuable.

None of these sets of ideas is without its critics. At one level, it can be argued that the aesthetics which, for example, motivate much environmental concern are not as fundamentally human as eating and drinking. Further, environmentalism can be seen as an ideological descendant of the Romanticism of the early nineteenth century and so is likely to be identified with reactionary politics.[9] This concern with political interpretations can be carried deeper into the structure of the language we use. For example, it may be that landscapes and species to which we attach value are expressions of cultural values: in North America, 'the wilderness' is said to be a repository of male and nationalistic traits. Even further, it is said that the current arguments about environmental ethics are incoherent because they use terms that only make sense in a system which has an agreed concept of human purpose and direction, a *telos*.[10] At present, such terms as rights, interests, utility and duty are all disguises for a determination to hold on to power. So the concept of rights (if it is to flow from a determination of intrinsic worth, for instance) is merely a fiction hovering above

reality. It may, of course, be a useful fiction for promoting change in human behaviour but it carries some other possibilities for abandoning the debate over environmental ethics since environmental 'problems' can be seen as social problems, to be solved by social action, with appropriate contributions from existing social and political philosophies.

In initial summary, therefore, the main foci of discussion in environmental philosophy and ethics at present seem to be:

- must an environmental ethic be based on human values, interests and goods or the corresponding features of the non-human world?
- does non-human nature have value in itself (i.e. intrinsic value) or only as a source of satisfaction of human wants (i.e. instrumental value)?
- can moral concern be directed only towards individuals or can it be directed towards groups or categories such as ecological communities and ecosystems?

The attempt to develop a different relationship with the non-human world, on paper and in practice, is gathering pace rather than abating, so we shall have to see in a little more detail some of the ways in which it is developing.

Pragmatics

To illustrate one practical outgrowth of ethical thinking about the environment, consider the 'lifeboat ethics' associated with the North American biologist Garrett Hardin.[11] Looking at resource availability in the future and at population growth rates, Hardin likens the situation to a series of lifeboats. The rich countries are like boats with a moderate number of passengers on board, the poor countries are like overcrowded vessels. The poor continuously fall out of their boat and hope to be admitted to one of the less crowded boats. According to classical Christian or Marxist ethics, says Hardin, everybody should be allowed aboard. This would lead to complete justice and equally complete catastrophe. Hardin argues that to help the poor at all (via technology transfers or food aid programmes, for example) is to diminish the safety margin for the wealthy and to reduce the choices for future generations. The stark impact of this outlook is somewhat modified by Ehrlich's 'triage' proposals, in which some selected individuals would be helped, following the practice of battlefield military medicine.[12] In this, casualties are divided into three categories: those who will die no matter what is done for them; those who will live even if treatment is delayed; and those for whom treatment makes the difference between life and death. These latter might be admitted to the lifeboats. Both these proposals attracted the realistic and the hard-headed among international development and financial agencies, just as they have evoked opprobrium from those who see the ideas as 'anti-people', from those who argue that justice ought to be maximised before general well-being, that our duties to the present generation outweigh those to future generations and that democratic decision-making would produce a different set of outcomes. Whatever one's views of these proposals, they have a directness of approach not characteristic of all ethical discussion.[13]

To translate even utilitarian approaches into principles of normative behaviour is problematical. It is not simple to find a way of dealing with something as diverse as our own individual behaviour today (shall I go outside in the rain to the compost heap with the potato peelings or put them in with the wastes that go to the municipal tip?) all the way to the whole of humankind tomorrow (how many of them will there be, ought there to be, and to what quantity of resources should each person have access?). Much current action seems to be based on the cost-benefit ratio as an instrument.[14] This is an imperfect technique and says, for example, very little about the distribution of the happiness and good which may be achieved; it also says nothing about any future that cannot be programmed in terms of discount rates. Yet such is the predominance of the western world-view that it has eclipsed most other value systems as a way of re-ordering the world. Students of ethics, however, can at least point to other choices that could be made, both by individuals and more especially by societies. It should be possible to bias decisions against arbitrary choices based on random or temporary factors or whims of powerful individuals; to bias decision-making towards those humans and non-humans who are especially vulnerable to change; to decide always in favour of the sustainable benefit rather than the one-off haul; and always to move against causing harm as distinct from merely foregoing benefits.

The Non-Human World

Although in our anthropocentric way we calmly categorise the rest of the planet as the non-human world, this does not mean that we are released from concern about it. In general, though, there has been a hierarchy of attention based on the degree of similarity between ourselves and the other components of the system: other mammals get the most intensive treatment, then other animals, and thereafter plants, the soil and inanimate things. Of late, the whole biosphere in a functional sense has also commanded the regard of writers on ethics.[15]

Our knowledge of the nature of animals is still accumulating but the more we have, the more it seems true that there are more continuities of biology and behaviour than have in general been recognised.[16] The recognition of an evolutionary continuum between humans and other species seems fundamental to the kinds of judgements we are apt to make about other species of animals. This was not always so: in the West there has been a long tradition of regarding animals as outside the moral universe.[17] Some of this, in e.g. the seventeenth and eighteenth centuries, was largely verbal as philosophers tried to refine the terms of debate, so that their refusal to grant moral standing to animals in the pages of their books was somewhat offset by their love of their dogs or their care over replacing caterpillars on trees. Other parts of it were more practical: St Augustine took over the Stoic tradition of refusing to grant animals any moral consideration and this Christian tradition was kept up by, for example, Pope Pius IX (pontificate 1846–1878) who refused, on those identical grounds, to allow the setting up of a Vatican branch of the Society for the Prevention of Cruelty to Animals. Away from such centres of sensitivity, European colonists killed the native humans and the native fauna with equal facility when they felt like it, and many do

not now shrink from the rapid dispatch of spiders in the bath-tub although we may prefer to have lambs made into chops somewhere well out of sight, sound and smell.

One of the turning points in the development of a new sensitivity was epitomised by Jeremy Bentham (1748–1832) who pointed out the essential contiguity of humans and other animals when he argued that the question was not 'can they reason?', nor 'can they talk?' (neither of which can be said of human babies), but 'can they suffer?'. Within that framework, lower animals were held not to be able to suffer, however. In industrialising countries, the social reforms of the late nineteenth century usually included animals, either by prohibiting cruelty or trying to protect wild creatures, or both. The reasons for this greater sensitivity to the fate of animals have been elaborated by many writers and no one argument seems to be pre-eminent.

First of all, there are the feelings experienced by humans for animals. These need no elaboration except to say that they are easily dismissed by the severely rational as being 'mere emotion'. But as Mary Midgley argues so cogently,[18] they are a necessary part of any moral universe, though not sufficient in themselves as the basis of an ethical code. They are, of course, likely to be socially and culturally relative but that does not invalidate the feelings of those who have them. But even in societies with highly developed feelings towards dogs,[19] for example, the use of experimental animals to test cosmetics is still allowed. Moving towards a more objective approach,[20] there is the value (potential if not actual) to us of a species as a resource: for food perhaps or like the nine-banded armadillo which is the only other animal that can catch leprosy and therefore is a test-bed for treatments. And at a slightly further distance towards intellectual and scientific argument, there is the value of biological diversity as material for evolution.

But beyond these ideas which stem from human-centred concerns (which are sometimes labelled 'subjective values' or 'instrumentalist values'[21]) is the proposition that animals have a good all of their own which is completely external to human purposes, i.e. they have intrinsic value. In most people's reckoning this gives them moral standing but not, it appears, equal moral significance in case of conflict. Nevertheless there are those who argue for the equality of all species, whereas others will say that there is a difference between sentient beings and non-sentient ones, with a line being drawn somewhere above the bacteria and viruses. The discussion is carried further by the protagonists of animal rights.[22] They aver that animals have every right to as much moral consideration as have humans and that such standing should be encapsulated in law to the same extent as human rights are thus (somewhat variably) enshrined. Opponents of that view rest their case on the impossibility of animals having interests in the philosophical sense and on their being unable to fulfil the reciprocal obligations which are an essential part of the granting of rights. Instrumentally minded writers are worried that full-scale granting of intrinsic rights to animals would make it impossible for humans to go on living in anything like the ways to which we have become accustomed: we cannot all become Jainists, it is supposed.[23]

Many of the animal-related arguments also apply to other parts of the biosphere and some even to the atmosphere and the rest of the cosmos as well. Plants are the obvious next step, and the larger ones such as trees attract most attention,[24] performing a function analogous to mammals in the zoological realm. Beyond them is the

question as to whether the biosphere as a functional whole has a moral standing. Those in favour point to the interconnectedness of everything: without it, they say,[25] humans would not exist let alone have the energy to argue about the future of the Indian Tiger. So there is no real barrier between an individual and the rest of the cosmos and even less so between us and say the plants of this planet.[26] Those against point once more to the ideas of interest and obligation which are inherent in the concept of rights and standing and which the biosphere cannot possess, being non-sentient. By extension, also, not every relationship of interdependence also carries with it a moral bond. Nevertheless our consequent behaviour might have to go no further than Immanuel Kant (1724–1804) who said that we should act as if our maxims had to serve at the same time as a universal law for all the entities that make up the world. 'Think globally, act locally' is today's Green version of the same thing.

Current Western Ethical Systems

We turn now to comprehensive systems of normative behaviour, which lay down principles for the treatment of the environment in its totality. Some systems are extensions of those which deal with people or animals; others are especially formulated in the light of our knowledge of the holistic nature of our environment and our place within it. We consider first those which are ecology-based. These have grown out of the findings of ecology as a science but are now transscientific in nature, having added values and moral imperatives to the original science. Second, we look at those which are theology-based, which in western terms means mainly Judaism and Christianity. Then there is a short section on ethics which derive from radical examinations of our constructions of the world via language, as with Heidegger. Lastly, the question of metaphysics is examined for its relevance to any ethics of the environment.

Aldo Leopold was an academic zoologist with deep roots in the rural landscapes of the USA. He became convinced as early as the 1930s that the emerging science of ecology showed ways of relating to nature that would avoid disasters like those of the Dust Bowl. Leopold argued for the development of an 'ecological conscience', to be elaborated into a 'land ethic' that understood the basic nature of the biosphere.[27] The ethic rests on the principle that an individual organism (humans included) is a member of a community of interdependent parts, with no rights to opt out. For Leopold, a process was right when it tended to preserve the integrity, stability and beauty of the biotic community, and contemporary land economics did no such thing, for land, like Odysseus' slave girls,[28] was still property. More recent commentators have pointed out some difficulties with the land ethic idea.[29] At the empirical level, it is not clear just how the manipulative effects of mankind are to be accommodated, since some of them may be stable and even beautiful but have unhappy social consequences.[30] At the philosophical level, professionals of that art have pointed out that the presence of a community fails to generate obligations *ipso facto*. There must be common interests among the members plus a recognition of their mutual obligations for them to be imposed. Further, it can be argued that it is not right to extend ecological concepts like stability, homeostasis and equilibrium to the realm of ethics without proper

analysis and qualification. It is certainly the case that these concepts are subject to continual refinement and sometimes radical change. Yet, it is counter-argued, such concepts might provide in some way as yet unspecified a set of objective and cross-cultural norms for the moral assessment of human impact on the environment;[31] further, the nature of the biosphere may be such that, for example, humans and bacteria do have a common interest although they may not be able to communicate this in writing.[32] Although ethical diversity and plurality in themselves may be a moral good,[33] it is difficult to avoid the problems of variability and language. As Aristotle first said, ethics and politics deal with continuous variables and so there could be no certainties in the field of normative decision; similarly we ought perhaps to acknowledge that ecology is not likely to provide the same kind of quantitative and predictive help as the laws of physics and chemistry. It is perhaps always going to be better as a component of attitude formation, but even here there may be the need to formulate different languages and terminologies for ecology as one of the instrumental sciences of human-directed environmental manipulation and as an agent and motivator of environmental protection and preservation.[34]

Beyond this relatively obvious outgrowth of ecological science, another ethic has been put forward, based this time on the convergence of the Gaia hypothesis and the ideas of self-realisation which the West discovered after about 1965. A labelling phrase might be something like 'secular transcendent holism', but plain 'Holism' is less of a mouthful. We recall that the Gaia hypothesis is based on the existence of a number of planetary feedback mechanisms which tend to optimise the conditions for life, though not necessarily for human life-styles, and that they appear to form a genuinely single system. Thus the single term 'Gaia' can be used and the pronoun 'she' is often a corollary, as is the postulate that she behaves in some ways like a single organism.[35] Philosophers have tried then to explain the peculiar features of the human presence within the Gaian system. On the one hand humans may possibly form the nervous system of this 'organism', able to communicate with all of the parts as well as with each other. The flow of information between some sectors and the humans may well be in the form of intuitive knowledge rather than scientific knowledge since we may not yet know explicitly all the ways in which Gaia communicates with her parts.[36] On the other hand, alas, humans might be more akin to cancer cells, proliferating exponentially and 'eating' everything in sight. In that case, modified behaviour propelled by a holistic ethic in which we are 'greened' by Gaian forces is the only route to human survival.

The core of the new environmental behaviour then becomes an awareness of self in which we no longer stop at the boundary of our skins nor indeed perhaps at the limit of our tentacular reach for resources. Instead we are to see ourselves as united with the rest of the universe in a ground of being. One analogy would be that of a drop of water from an ocean: each drop is individual and unique but all are of the same essence as the ocean. This type of thinking has been carried forward by the physicist D. Bohm who uses as analogy the laser hologram in which every portion of the image carries the information needed for the whole.[37] He talks of the material world as being the explicate manifestation of an implicate order in which everything (including human consciousness) is enfolded in everything else. The non-duality of humans

and environment thus suggested is reminiscent of many of the religious and philosophical systems of the East.[38] A time dimension may be important as well, for this seems in the western tradition to be unidirectional and thus makes possible the theory of evolution. Secular holists have taken over the concepts of Teilhard de Chardin (which are of course religious: he was a Jesuit[39]) in which there is a progressive infolding of all nature, transforming itself towards some final omega-point of convergence of the consciousnesses of everything. In secular versions, mankind becomes a director of the course of evolution (consider genetic manipulation for example) and thus has special responsibilities. For Henryk Skolimowsky, for instance,[40] we must become the equivalent of priests superintending the unfolding of a sacred drama.

To look for simple rules and cohesive patterns of discussion in the literature and events of ecology-based ethics is very difficult. Perhaps there is throughout an emphasis on process as distinct from objects, in the sense that what we call things are no more than isolated glimpses of something in the process of becoming, just as the bright star is dependent for its luminosity on the darkness of space or just as life holds within itself the promise of death.[41] The human role is seen by some to be determined by Gaian imperatives in which by some metanoic process we shall all change our behaviour; others prefer a continuation of our Promethean traditions, in which we must assume that we are the governors and the innovators but having like all rulers a special responsibility for those whom we rule. Harnessing biotechnology and all other forms of technology, the inheritors of the mantles of Chardin and Buckminster Fuller[42] are anthropocentric to the point of wanting humans consciously to manage the evolutionary processes of the planet: humans act as co-pilots of Spaceship Earth, making management decisions based on information technology. Although starting out from similar bases to the ecological ethics programmes described above, and responding to similar initial environmental pathologies,[43] the holists of this kind are a long way from ecocentric, as distinct from anthropocentric, behaviour.

Theology-based Ethical Systems

Common to all religions is the idea of a first and ultimate cause, usually expressed verbally as God (or Gods) or the One, or a variant of these words. In many societies, the gods have been identified as being present within all or some of the phenomena of nature and hence as much part of the environment as the air: **pantheism** of this kind, for example, was characteristic as much of ancient Greece as it is of some aboriginal North Americans today.[44] In the West, however, **monotheism** has become dominant[45] and this has been exported along with the other components of the western worldview; we shall here examine the western traditions first and then look at the contribution of other parts of the world.

In the West, early developments about which we know certainly included nature and her processes as part of the focus for worship and ritual and indeed the mystery of the life force was located within such an ecology. The eclipse of these religions by Judaism and then by Christianity, however, removed the mystery to the one God who was spatially much more remote than His many predecessors, though knowledge of

Him could now be passed down in written form. At any rate, it could be deduced that there was something of a gap between God and mankind and that the close identification of humans with the land was to some extent sundered: 'The land belongs to me, and you are strangers and guests' (Leviticus 25:53). Even the concept of time became different in post-Judaic western religion, for it could not be renewed annually but was linear and each instant was unique. Thus the past could be romanticised as it passed further away and the notion of a Golden Age was born.[46]

The burgeoning of interest in the environment from the 1960s provoked a surge of examination of the Christian position: was mankind indeed alienated from 'the land' for one reason or another, or were we all still part of a continuing Creation which was good, to put it in a highly simplistic form?[47] The first tradition is perhaps the easiest to identify and describe. It derives from the notion that mankind is made, uniquely in the omneity, in the image of God and therefore has the right to behave in a god-like manner towards the rest of the cosmos. This at first sight appears to be the message of the much quoted passages in Genesis I 26–29, where being fruitful, multiplying, having dominion and subduing the earth are the direct commands of God, though not, we must reluctantly presume, in English.[48] This passage was used by Lynn White, a North American historian,[49] as the basis for saying that the 'ecologic crisis' could be laid at the door of the Judaeo-Christian religious heritage of the West, since this passage clearly gave a licence to exploit plants, animals and even every creeping thing. A kind of confirmatory evidence of this view comes in Pope John Paul II's Third Encyclical *Laborem Exercens* in which the forcing of nature to productivity for human ends is seen as a kind of quantitative measure of human grandeur.[50]

A second long-standing tradition is that humans are part of God's Creation just like the rocks and the trees and that no one part of this is inherently superior to another: there is a basic spiritual equality. In this view, both man and nature become co-creators of the cosmos (*cosmos*, it will be remembered, is a world with order) and God is, has been, and will be present in all things. This doctrine of immanence is more sharply focused by the life of Christ, which confirmed that the universe is within God (i.e. pan-en-theism).[51] The rather less abstract symbol of this strand of belief is generally taken to be Francis of Assisi talking of Brother Sun and Sister Moon[52] and preaching to the birds (did he listen as well?); here in Northumbria we have our own ikon, that of the ascetic St Cuthbert being kept warm by Eider Ducks (still known regionally as Cuddy Ducks[53]) after one of his spells of fasting and immersion in the North Sea. Recent interest in this tradition has produced for us figures like Hildegard of Bingen (1098–1179) who celebrates the inherent divinity and beauty of all creation. This is coupled with warnings about the sins of indifference and injustice to nature, for creation demands justice.[54] She used the term *viriditas* ('green truth') and wrote some prescient poetry:

> Now in the people
> that were meant to be green …
> The winds are burdened
> by the utterly awful stink of evil, …
> Sometimes this layer of air
> is full,

full of a fog that is the source of many destructive and barren creatures
that destroy and damage the earth
rendering it incapable
of sustaining humanity.

Much Christian theology is, however, dominated by the concept of the Fall. Any human act is therefore imperfect (and at best provisional) and its redemption is by Grace and probably not in our time.[55] Since the Bible is the source of this world-view, it can also be seen as the only source of ideas about adapting to it. But faith in the literal truth of the Bible as a source-book for ethics as well as theology is variable.[56]

It seems as if there are two distinct ethical strands which can be woven out of history and dogma. They relate to the historical traditions discussed above, though with added elements in each. From the first strand comes the common-sense exhortation to recognise the superiority of mankind as being at the apex of creation (so far) but to use the power thus granted with an acute sense of responsibility. This is particularly a Benedictine trait and the example of reclamation of waste places by their medieval abbeys is often cited. So the notion of stewardship is paramount: we are in the position of temporary holders only of the office of steward or vice-regent or overseer and we are required by the Landlord to leave the estate in at least as good a condition as we found it.[57] One trouble here is that the instructions for doing so are nowhere near as explicit as those found say beside the bath in a cheap hotel: how do religious people decide whether it is right to drain swamps or to preserve them for their wildlife?

In some contrast, the Franciscan view has been much amplified by being caught up in the kind of evolutionary mysticism propounded by Teilhard de Chardin. He saw cosmic history as an evolution of consciousness which would end with a total enfolding of the Universe at an omega-point, a final unity with the glorified Christ as Pantocrator.[58] So today's Franciscanism has a much less practical outlook than the stewardship camp (though it is presumably not incompatible with it) in the sense that it is more contemplative and seeks to 'green' (to borrow a phrase) individuals rather than produce institutional change in an overt manner. Essentially, this strand of belief plays down the fallen side of humanity and prefers to be celebratory so as to revel in the diversity of all forms of life and the richness of human culture.[59]

The ethical implications of the kinds of beliefs outlined above are not easy to discover, for Christians seem to be able to discover a whole range of proper responses to them: some justify rapid use of resources to create wealth on the grounds that if the Samaritan had not been wealthy he would not have been able to help, whereas others argue for vegetarianism and an extra sweater. There seems to be some concentration, nevertheless, on the preservation of the wild and its non-human inhabitants, on our responsibility to future generations, on respecting the carrying capacity of our surroundings, on the satisfaction of genuine need rather than the inflated demands of consumerism,[60] on the use of appropriate technology rather than everything that the inventors can come up with and sell, and with the need to resacralise nature.[61] This last involves putting some of the reverence for life and its mysteries and connectivities back into nature herself rather than allowing it to reside in a remote judgemental sky-god. The poet Gary Snyder phrased it in a rather extreme but cogent way when he

said that our [ecological] troubles began with the invention of male deities located off the planet. No wonder, then, that a mystical version of Gaia is attractive to those on the fringes of western religions. Such developments have persuaded radical-thinking but tradition-rooted theologians like J. B. Cobb to develop postmodern religious views which combine the insights of the natural sciences with those of creation-based western theology.[62]

Non-western Religions

In the years of high public concern with environmental matters that ended with the UN Conference in Stockholm in 1972, there was much interest in eastern philosophies and religions, and in North America in the beliefs of the native peoples. A contrast can be drawn, for example, between the instrumental view of nature espoused by Anglo-Americans, in which the land and waters are simply resources, and that of the Indians.[63] For the latter, their traditional cultures held that they occupied a sacred space and that all their actions therefore needed sanction from a god or gods, often accompanied by the appropriate ritual. With renewed self-consciousness, however, these beliefs are undergoing a renaissance among the Indians themselves and they are being held up by some in the Euro-American community as examples for the nation to follow.

The religions of the North American aborigines (like those of Australia) have never shown much capacity for exportability, whereas those of south and east Asia have always had some fascination for westerners. Thus again in the 1960s and 1970s, Hinduism and Buddhism became much better known in the West and especially for the environmental attitudes which they potentially engendered. (Buddhism will be treated here as a religion since it seems to function as such, though *sensu stricto* it is atheistic.) In Hindu cultures, there is a long tradition of environmental protection, couched under the concept of non-injury or *ahimsa*.[64] In fact, the adoption of vegetarianism and a simple life-style as advocated by Mahatma Gandhi constitutes in itself a predisposition to a relatively low environmental impact.

For Buddhists, the environment is not different from most other phenomena: it can be an object of human attachment and therefore of suffering. Thus an attachment to worldly things that derive from it will end in unhappiness and the law or *Dharma* will ensure that the soul will not escape from the cycle of continual rebirth. There is then a *de facto* ethic of low impact which once again finds expression in an aversion to the taking of life and hence to vegetarian eating. At some stage in its eastward spread from India, Buddhism took aboard many of the essentials of the native Chinese Taoism and the result is known by its Japanese name, Zen.[65] The Tao stressed a quietistic attitude to life: harmony with the cosmos was to be sought by finding its ways and rhythms and adapting to them, rather than striving to alter things and other people. The contribution of Zen has been in stressing the unity of all things and in the primacy of experiential knowledge rather than objective rationality. Buddhism has combined with native Japanese animist religion (*shinto*) to produce one of the most nature-conscious and delicate aesthetics ever. This too is underlain by a non-dualist

philosophy in which the subject-object division of western positivism is absent. This is often summarised in the Japanese phrase '*mono no aware*' ('sensitivity to things'). Emotion is the basis for an awareness of other species, light, weather and eventually of the environment as a whole. There is no vestige of a hierarchy of existence.[66] Since the nineteenth century this has not prevented western values from predominating (indeed, it may have encouraged them since change is always to be expected) although there is now renewed interest in traditional Japanese values and ways.[67] In a broader sense, a progression of concentration upon visual images and their associated emotions can produce the metaphor of nature as a mandala. We might compare this with the well-known image of Earth from space. Such a view of interconnectedness is more explicitly delineated in a central image of Hua-yen Buddhism, the jewel net of Indra. A net is hung which stretches out infinitely in all directions. In each 'eye' of the net is hung a single jewel in whose polished surfaces is reflected all the other jewels, infinite in number. The relationship is one of simultaneous mutual identity and mutual inter-causality.[68]

Islam is monotheistic and based on a book like Judaism and Christianity, and the book (the Holy Qur'ān) is quite explicit in setting humans as stewards of the gifts of Allah.[69] All human activities must be based on the idea that the Earth is only a temporary home (even though man is a superior being) and that to find favour in the next world, our actions must be properly administered as a manifestation of faith. These include justice and piety plus the appropriate knowledge and understanding of environmental problems.

It has to be said that in both East and West many religious traditions have collaborated with human behaviour that is destructive of species and habitat, and with non-sustainable development. In the West, obviously, there has been little sieving of technology and much talk of the conquest of nature; in the East no guidelines have been elaborated for alternative forms of economic and social growth that are ecologically sustainable.[70] In all, some reconstruction of the historic faiths seems to be needed if they are to contribute to an evolutionary *modus vivendi*. It seems unlikely at the moment that, outside the areas of revolutionary Islam, religion as such will play a large part in directly developing normative behaviour, though it may well contribute to the formation of new public ethics of an environmentally related character.

Deep Ecology

It is obvious that both ecological ethics and spiritually inspired holism require a change of world-view. A harmony with nature, the avoidance of pollution, the discussion of the possibility of all life having its own intrinsic value, self-realisation rather than economic growth and consumerism, appropriate technology, recycling and thrift, and the organisation of human communities on a regional basis, with great attention paid to minorities, are all found at one point or another in the literature of advocacy. Some, however, have seen this as reformist rather than radical and hence an insufficient response to today's problems. A more radical position is called Deep Ecology and is largely associated with the Norwegian philosopher Arne Naess, who in the

1930s worked with the Vienna School of positivists but who has moved rather far from them.[71] Naess's concept of Deep Ecology collects together the findings of ecological science, the pantheism and process metaphysics of Baruch Spinoza (1632–77), and the historical linguistics of Heidegger.[72] Like some western and many eastern philosophies, Naess constructs a world-view with no ontological divide in the field of existence: there can be, for example, no dichotomy of reality (or value) between the human and the non-human. Similarly, people are knots in a total field and the realisation of Self must not lead to self-centredness but rather to a connectivity with all things which goes beyond mere altruism. This world-view translates into two fundamental norms. The first of these is shared with some of the New Age advocates in the primacy accorded to self-realisation. In this, we must achieve identification with the non-human world: we must learn to 'think like a mountain' and hence let all things be themselves. To harm nature is to harm ourselves. The second norm, also shared to some extent by the previous systems, is that of biocentric equality. The world is no longer our oyster, we share it with the oysters (Table 7.1).

In such a world all things are able to achieve their own self-realisations and thus the space occupied by any 'thing' (ourselves and our technology especially) must be limited to allow all the other things to flourish. One of the great differences between Deep Ecology and the other holisms, however, is its insistence on the value of the experiential as well as the rational, believing as it does that Cartesian dualism is at the heart of most unsustainable relationships within the biosphere. Naess finally collects all his ideas into what he calls *ecosophy*, 'eco-wisdom'. But as his book sets out, he can only talk of 'an ecosophy' because this is a personal system yet one which recognises that many different yet mutually acceptable interpretations of nature are both possible and acceptable. Criticism has been quite strong.[73] There are the obvious questions of the 'how do we get there from here' type, but also a fear that any challenge to the absolute reality of the discrete human individual will lead to some form of totalitarian nightmare: ecological fascism is the label sometimes applied. The counter-argument centres round the opposite view that the glorification of the rights of the individual has in practice led as much to totalitarian societies as those based on notional equality.

The scope for developing Deep Ecology seems quite wide. Recently, other currents seem to have got merged with it: examples are systems thinking, bioregionalism, holistic medicine and healing, feminism and the nuclear disarmament movement. Green politics in its more radical forms is also a likely component.

TABLE 7.1
A Platform for Deep Ecology

1	The value of non-human life is independent of the usefulness of the non-human world as resources.
2	The diversity of life forms has a value in itself and humans may reduce this variety only to satisfy vital needs.
3	The flourishing of non-human life requires a diminution of the size of the human population.
4	The increasing manipulation of the non-human world must be reversed by the adoption of different economic, technological and ideological structures.
5	The aim of such changes would be a greater experience of the connectedness of all things and an enhancement of the quality of life rather than an attachment to material standards of living.
6	Those who agree with this have an obligation to join in the attempt to bring about the necessary changes.

SOURCE: Adapted from A. Naess, 'Deep ecology and ultimate premises', *The Ecologist* **18** (4/5) 1988, 128–31.

Towards a Radical Reconstruction

Many of the commentators on philosophy and ethics remark on the problems of all kinds caused by the almost overwhelming representation of anthropocentrism in western thought and world-view. Since these features of western lifestyle dominate the world in practice, they must be addressed if they are in fact the source of environmental problems. As we have seen, some thinkers try to increase our sense of responsibility, others would go in for mutual coercion, yet others would extend equal moral and legal standing to non-human objects which is in itself logically an anthropocentric act. So there is room for an altogether different way of looking at the difficulties, always bearing in mind that there will be problems of language if we wish to formulate radically novel concepts.

The philosopher most often cited as providing the beginning of such a construction is Martin Heidegger (1889–1976). He attempted to provide a new understanding of what things are and how humans should behave in the knowledge of that understanding.[74] He did not, however, try to formulate a developed ethic, but set an agenda for an all-encompassing *ethos*. For Heidegger, a central concept was that of Being: an event in which an entity could reveal or manifest itself as it really is. All things manifest themselves to each other (as the sun shines on flowers, for instance) but humans have the special capability of noticing that such presences occur. We are actually aware (in a way we suppose beetles and rocks are not) that these entities have a being and also that they might not have one. What then is the authentically human way to live in the presence of all these other beings? For Heidegger, human history and existence constitute a spatial and temporal clearing in which Beings can manifest themselves and be what they truly are, irrespective of their usefulness to us. But being ourselves Beings, we have an essential relatedness to all other beings and therefore to diminish their being is always to diminish ourselves. So here we are beyond the idea of the extension of rights to other components of the biosphere: Heidegger put forward the idea that the core of the relationship was care (*Sorge*) with humans as shepherds of Being, where that Being was a totality of earth and sky, gods and mortals assembled together. All these ways of being are significant and no one determines the nature of the others.[75] In other words, we allow ourselves freedom to Be what we truly are when we understand rightly what our place is in the universe, and that is certainly not a position which regards all other beings as a 'standing reserve' of materials.

> Mortals dwell in that they save the earth. … Saving does not only snatch something from a danger. To save really means to set something *free* into its own essence. To save the earth is more than to exploit it or even wear it out.[76]

In the end, the message seems to be that in the West especially we must be more open to the possible and that may well mean accepting that there are limits to the sort of rationality to which Aristotle and Descartes have accustomed us.

The End of Ethics

The study of normative behaviour looks inwards and outwards at the same time. In the case of the former, there are two especially popular windows. There are those who say that basically the human concepts of utility and justice as elaborated in the West are all that is needed for a viable and valid environmental ethic. But a problem here is the fragmentation of advanced societies into systems such as law, education, economy and religion. The need for an ethic produces a level of debate in each. But since no one function system equals the whole of society, the level of resonance in any one function system does not necessarily produce a valid ethic for all. Thus others argue that some new metaphysical insights (in particular going beyond the present range afforded by the various brands of humanism) are needed.[77] In the latter field, the non-separation of everything which is one of the more startling results of modern quantum theory at the particulate scale is a possible starting point for the discovery of intrinsic value in non-human entities. Here, if the self is valuable, then all else is equally valuable.[78] This argument can be extended to suggest that the universe in its entirety possesses a measure of self-hood in being a self-realising system. It does not have a purpose or *telos*, but it is dynamic and unfolding just like smaller scale manifestations such as an organism. This idea of self-realisation can be extended to inorganic things if we include the system in which they are embedded. Humans can add an extra dimension since we alone can understand our relationship with greater wholes as well as smaller parts.[79]

It is difficult to see a discussion of the Copenhagen Interpretation of quantum theory being the basis for a Greenpeace call for funds.[80] But the movement towards the development of a better public ethic brings in various of the ideas discussed in the last few pages. They are neatly put together by Charlene Spretnak at the end of her book on spirituality in Green politics[81] and they act as a good overall focus precisely because they bear no very clear relationship to what she says earlier in the book, i.e. they are as valid in a secular context as in a transcendental one. She calls for ecological wisdom, grassroots democracy, personal responsibility over lifestyle, non-violence, community-based economies, post-patriarchal values, respect for diversity, a global responsibility and a vision for the future which focuses on the quality of life. Although there is a humanistic bias in these recommendations, they might well be a good start along even the most radical of non-anthropocentric roads towards an altogether different basis for ethics.

NOTES

1. It was clearly necessary at one stage to establish that environment was a fit topic for ethical inquiry and to try to define the outer boundaries of that inquiry. See H. Rolston, 'Is there an ecological ethic?', *Ethics* **85**, 1975, 93–109, reprinted in D. Scherer and T. Attig (eds) *Ethics and the Environment*, Englewood Cliffs, NJ: Prentice-Hall, 1983, pp. 41–53; T. Regan, 'The nature and possibility of an environmental ethic', *Environmental Ethics* **3**, 1981, 19–34; C. A. M. Duncan, 'On identifying a sound environmental ethic in history: prolegomena to any future environmental

history', *Environmental History Review* **15**, 1991, 5–30. As an overview introduction to the field, I found K. S. Shrader-Frechette (ed.), *Environmental Ethics*, Pacific Grove, CA: The Boxwood Press, 1981, especially helpful.

2. Ontology deals with what can, or cannot, exist, although in the case of nature this can be taken as given. The ontology then focuses on this and the foundations of our behaviour in it.

3. E. C. Hargrove, *Foundations of Environmental Ethics*, Englewood Cliffs, NJ: Prentice Hall, 1989, esp pp. 191–205. The recent history of the philosophy-ethics continuum in this field (very largely in North America, it seems) is described by R. F. Nash in chapter 5 ('The greening of philosophy') of his book *The Rights of Nature*, Madison, WI and London: University of Wisconsin Press, 1989.

4. The context is given for the use of both the natural and social sciences by J. Petulla, 'Toward an environmental philosophy: in search of a methodology', *Environmental Review* **2**, 1977, 14–43. See also the essays in J. R. Engel and J. G. Engel (eds), *Ethics of Environment and Development*, London: Belhaven Press, 1990, especially R. Kothari, 'Environment, technology, and ethics', pp. 27–35, and H. Rolston, 'Science-based versus traditional ethics', pp. 63–72.

5. B. S. Gower, 'What do we owe future generations?', in D. E. Cooper and J. Palmer (eds) *The Environment in Question: Ethics and Global Issues*, London: Routledge, 1992, pp. 1–12.

6. T. Regan, *op. cit.*, 1981.

7. J. Baird Callicott, 'Intrinsic value, quantum theory, and environmental ethics', *Environmental Ethics* **7**, 1985, 257–75. Not for the faint-hearted reader.

8. See F. Mathews, *The Ecological Self*, London: Routledge, 1991.

9. See the examples of P. R. Hay, 'The contemporary environment movement as Neo-Romanticism: a re-appraisal from Tasmania', *Environmental Review* **12**, 1988, 39–59. Also the extended treatment in A. Bramwell, *Ecology in the 20th Century: A History*, New Haven and London: Yale University Press, 1989.

10. M. Zimmerman, 'The critique of natural rights and the search for a non-anthropocentric basis for moral behaviour', *J. Value Enquiry* **19**, 1985, 43–53.

11. G. Hardin, *The Voyage of the Spaceship Beagle: Exploring New Ethics for Survival*, New York: Viking Books, 1972/Harmondsworth: Pelican Books, 1973; *idem*, 'Living on a lifeboat', *Bio-Science* **24**, 1974, 561–68.

12. P. Ehrlich, *The Population Bomb*, New York: Ballantine, 1968.

13. For a summary of this material see K. S. Shrader-Frechette, 'Alternative ethics regarding the environment', in *idem*, *Environmental Ethics*, Pacific Grove, CA: The Boxwood Press, 1981, pp. 28–44.

14. Most of this part of the discussion derives from R. Goodin, 'Ethical principles for environmental protection', in R. Elliot and A. Gare (eds) *Environmental Philosophy*, University Park and London: Pennsylvania State University Press, 1983, pp. 3–20.

15. These two paragraphs take their material from chapters 6–9 of R. Attfield, *The Ethics of Environmental Concern*, Oxford: Blackwell, 1983.

16. M. Midgley, *Beast and Man: The Roots of Human Nature*, Hassocks, Sussex: Harvester Press, 1979. See also R. Attfield, 'Attitudes to wildlife in the history of ideas', *Environmental History Review* **15**, 1991, 71–78.

17. See the historical discussion in chapter 5 of J. Passmore, *Man's Responsibility for Nature*, London: Duckworth, 1980, 2nd edn. Changes in sensibilities for one country for one 300-year period are illuminatingly discussed in K. Thomas, *Man and the Natural World: Changing Attitudes in England 1500–1800*, London: Allen Lane, 1983.

18. M. Midgley, *Animals and Why They Matter: A Journey Around the Species Barrier*, Harmondsworth: Penguin Books, 1983.

19. In May 1988 I saw the movie *The Unbearable Lightness of Being* which is filled with tragedy of various kinds. But it was the death of the dog that caused most tears in the audience.

20. See chapters 8 and 9 of R. Attfield, *op. cit.*

21. That is the idea that ideas can influence the practical world and that they should be graded in value by their success at the pragmatic level.

22. See T. Regan and P. Singer (eds), *Animal Rights and Human Obligations*, Englewood Cliffs, NJ: Prentice-Hall, 1976; P. Singer, *Animal Liberation: A New Ethic for Our Treatment of Animals*, London: Cape, 1976; idem, *In Defense of Animals*, Oxford: Blackwell, 1985; S. R. L. Clark, *The Moral Status of Animals*, Oxford: Clarendon Press, 1977.

23. A defence of commensense attitudes towards animals is given by M. P. T. Leahy, *Against Liberation: Putting Animals into Perspective*, London and New York: Routledge, 1991.

24. C. Stone, *Should Trees Have Standing? Towards Legal Rights for Natural Objects*, Portola Valley, CA: Tioga Publishing Co, 1988, 2nd edn.

25. M. A. Warren, 'The rights of the nonhuman world', in Elliot and Gare, *op. cit.*, pp. 109–34. See also, B. G. Norton, *Why Preserve Natural Variety?*, Princeton, NJ: Princeton University Press, 1987.

26. cf. Alan Watts, 'The world is your body', in R. Disch (ed.) *The Ecological Conscience: Values for Survival*, Englewood Cliffs, NJ: Prentice-Hall, 1970, pp. 181–93.

27. The main source is A. Leopold, *A Sand County Almanac*, New York: Oxford University Press, 1949. Be prepared for surprises like the delight in hunting and shooting. The earlier formulation can be seen in e.g. 'The conservation ethic', in the *Journal of Forestry* for October 1933, reprinted in R. Disch, *The Ecological Conscience: Values for Survival*, Englewood Cliffs, NJ: Prentice-Hall, 1970, pp. 44–55.

28. Leopold starts his 1933 paper by remarking on the fact that there was no ethical barrier to Odysseus hanging a dozen slave-girls when he got home on suspicion of their misbehaviour.

29. Especially J. Passmore, *op. cit.*, 1980.

30. In several of his works, the distinguished humanist René Dubos was fond of using the eighteenth-century landscape gardens of England as an example of the beneficent effects of the human hand. I tried, by correspondence, to convince him that there was another side to this in the shape of the dispossession suffered by many smaller landholders but I don't think I was ever persuasive.

31. W. T. Blackstone, 'Ethics and ecology', in W. T. Blackstone (ed.) *Philosophy and Environmental Crisis*, Athens, GA: University of Georgia Press, 1974, pp. 16–42.

32. R. Attfield, *op. cit.*, 1983, ch. 8.

33. J. R. Engel, 'Ethics', in D. C. Pitt (ed.), *The Future of the Environment: The Social Dimensions of Conservation and Ecological Alternatives*, London and New York: Routledge, 1988, pp. 46–59.

34. See the wide-ranging discussions in A. McLaughlin, 'Images and ethics of nature', *Environmental Ethics* **7**, 1985, 239–319; and M. Sagoff, 'Fact and value in ecological science', *ibid.*, 99–118.

35. For the Gaia-human mind linkage see P. Russel, *The Awakening Earth: Our Next Evolutionary Leap*, London: RKP, 1982.

36. T. Roszak, *Person/Planet: The Creative Disintegration of Industrial Society*, New York: Doubleday/Anchor, 1978; London: Gollancz, 1979.

37. D. Bohm, *Wholeness and the Implicate Order*, London: RKP, 1982.

38. Although pointed out in Aldous Huxley's *The Perennial Philosophy* (London: Fontana, 1958), the most famous statement of it in the present context is F. Capra, *The Tao of Physics*, Berkeley, CA: Shambhala Press/London: Wildwood House, 1975.

39. Pierre Teilhard de Chardin, *The Phenomenon of Man*, London: Collins, 1965. For a primer and guide to Chardin, try J.-P. Demoulin (ed.), *Let Me Explain*, London: Collins, 1970. When typing this chapter into the word-processor I used 'de' as an abbreviation for Deep Ecology, then replacing it globally with the full spelling. The result in two or three places was Pierre Teilhard Deep Ecology Chardin, which might delight some people.

40. H. Skolimowsky, *Ecophilosophy: Designing New Tactics for Living*, London: Marion Boyars, 1979.

41. F. Capra, *The Turning Point: Science, Society and the Rising Culture*, New York: Simon and Schuster/London: Wildwood House, 1982.

42. R. Buckminster Fuller, *An Operating Manual for Spaceship Earth*, Carbondale, IL: Southern Illinois University Press, 1969.

43. It is customary to point out that the Chinese ideograph for 'crisis' contains two elements: *wei* for 'danger' and *chi* for 'opportunity'.

44. M. Eliade, *A History of Religious Ideas*, vol. 1. *From the Stone Age to the Eleusinian Mysteries*, Chicago and London: University of Chicago Press, 1982, trans. W. R. Trask. First published in French in 1978.

45. Eliade, *op. cit.*, vol. 2. *From Gautama Buddha to the Triumph of Christianity*.

46. M. Eliade, *The Myth of the Eternal Return or, Cosmos and History*, Princeton University Press, 1971 (original edition 1954), Bollingen Foundation Series XLVI.

47. A chronology of changes in religious (mostly Christian) thought in North America is given by R. F. Nash in chapter 4 ('The greening of religion') of his *The Rights of Nature: A History of Environmental Ethics*, Madison, WI and London: University of Wisconsin Press, 1989.

48. J. Kay, 'Human domination of nature in the Hebrew Bible', *Ann. Assoc. Amer. Geogr.* **79**, 1989, 214–32.

49. L. White, 'The historical roots of our ecologic crisis', *Science* **155**, 1967, 1203–7, and much anthologised since as well as heavily criticised by both Christians and those of secular views. A fine example of a really seminal paper, right or not.

50. Quoted by J. Cobb, *Ecology and Religion: Toward a New Christian Theology of Nature*, Ramsey, NJ: Paulist Press, 1983. This whole book is probably one of the most concise and coherent statements of both history and dogmatics available.

51. A. R. Peacocke, *Creation and the World of Science*, Oxford: Clarendon Press, 1979, The Bampton Lectures, 1978. A difficult book but remarkable in its comprehensiveness.

52. Lynn White (see n 49) proposed St Francis as the patron saint of ecologists. However, Francis is quoted as saying 'every creature proclaims "God made me for your sake, O man!"' (P. Singer, 'Not for humans only: the place of nonhumans in environmental issues', in K. E. Goodpaster and K. M. Sayre (eds) *Ethics and Problems of the 21st Century*, Notre Dame, IN and London: University of Notre Dame Press, 1979, pp. 191–206).

53. Inexplicably, this legend is omitted from the anthology edited by C. Bamford and W. Parker Marsh, *Celtic Christianity: Ecology and Holiness*, Edinburgh: Floris Books, 1982. In fact there is some nature in this book but not much ecology.

54. See, for example, M. Fox, *Illuminations of Hildegard of Bingen*, Santa Fe, NM: Bear and Co, 1985; G. Uhlein, *Meditations with Hildegard of Bingen*, Santa Fe, NM: Bear and Co, 1983. She was no mean musician, either: listen to the *Symphoniae* on CD Editio Classica GD 77020.

55. H. Schwarz, 'The eschatological dimension of ecology', *Zygon* **9**, 1974, 323–38.

56. R. H. Hiers, 'Ecology, biblical theology, and methodology: biblical perspectives on the environment', *Zygon* **19**, 1984, 43–59.

57. At its fullest expression in J. Black, *The Dominion of Man: The Search for Ecological Responsibility*, Edinburgh University Press, 1970. Subsequently subjected to strong criticism by

J. Passmore, *Man's Responsibility for Nature*, London: Duckworth, 1980, 2nd edn, who argues that stewardship can only apply to the control of men by men. It is interesting to note that the Papal Encyclical of 1981 constantly refers to the subduing aspect of Genesis but not at all to the stewardship or responsibility aspects (*Laborem exercens*, Encyclical Letter of the Supreme Pontiff John Paul II on Human Work, London: Catholic Truth Society, 1981).

58. P. Teilhard de Chardin, *op. cit.*

59. See S. McDonagh, *To Care for the Earth: A Call to a New Theology*, London: Chapman 1986; M. Fox, *Original Blessing*, Santa Fe, NM: Bear and Co, 1983; idem, *Creation Sprituality*, London: Harper Collins, 1991. Matthew Fox was silenced by the Vatican in the late 1980s. The fusing of environmentalism, feminism and religion can be seen in A. Primavesi, *From Apocalypse to Genesis*, London: Burns and Oates, 1991. Primavesi sees the fall not as a cosmic tragedy but as a coming to maturity.

60. See, for instance, J. V. Taylor, *Enough Is Enough*, London: SCM Press, 1975, and the account of the low-impact lifestyle movement in H. Dammers, *Life Style: A Parable of Sharing*, Wellingborough, England: Turnstone Press, 1982.

61. A. R. Drengson, 'The sacred and the limits of the technological fix', *Zygon* **19**, 1984, 259–75. See also L. Gilkey, 'Nature, reality and the sacred: a meditation in science and religion', *Zygon* **24**, 1989, 283–98, and the extended discussion of 'sanctity' in H. Skolimowski, *Living Philosophy: Eco-philosophy as a Tree of Life*, London: Arkana Books, 1992.

62. J. B. Cobb, 'Ecology, science and religion: toward a postmodern worldview', in D. R. Griffin (ed.) *The Reenchantment of Science: Postmodern Proposals*, Albany, NY: SUNY Press, 1988, pp. 99–113.

63. J. Donald Hughes, *American Indian Ecology*, El Paso, TX: Texas Western Press, 1983; J. D. Hughes and J. Swan, 'How much of the earth is sacred space?', *Environmental Review* **10**, 1986, 247–59.

64. O. P. Dwivedi, B. N. Tiwari and R. N. Tripathi, 'The Hindu concept of ecology and the environmental crisis', *Indian J. of Public Administration* **30**, 1984, 33–67.

65. A well-known and somewhat flamboyant interpreter of the Tao and of Zen for westerners was Alan Watts. See his *Nature, Man and Woman*, New York: Vintage Books, 1970; first published New York: Pantheon Books, 1958.

66. D. E. Shaner, 'The Japanese experience of nature', in J. B. Callicott and R. T. Ames (eds) *Nature in Asian Traditions of Thought*, Albany, NY: SUNY Press, 1989, pp. 163–82. Another 'cross-cultural' comparison is made in D. E. Shaner and R. S. Duval, 'Conservation ethics and the Japanese intellectual tradition', *Environmental Ethics* **11**, 1989, 197–214.

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J. D. Hughes (eds), *Ecological Consciousness*, Washington, DC: University Press of America, 1981, especially the contributions by Dolores LaChapelle, pp. 295–324, and G. Sessions, pp. 391–463, which has a very large bibliography; B. Devall and G. Sessions (eds), *Deep Ecology: Living as if Nature Mattered*, Salt Lake City, UT: Peregrine Smith Books, 1985; G. Sessions, 'The Deep Ecology movement: a review', *Environmental Review* 11, 1987, 105–25; F. Matthews, 'Conservation and self-realization: a deep ecology perspective', *Environmental Ethics* 10, 1988, 347–55. Earlier work by Naess includes 'The deep ecology movement: some philosophical aspects', *Philosophical Inquiry* 8, 1986, 10–31, and 'The shallow and the deep, long-range ecology movements: a summary', *Inquiry* 16, 1973, 95–100.

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73. In e.g. A. Brennan, *Thinking about Nature*, Athens, GA: University of Georgia Press, 1988, especially the chapter on 'Theory, fact and value'. Deep Ecology does not go far enough for G. Foley, 'Deep ecology and subjectivity', *The Ecologist* 18 (4/5), 1988, 119–22.

74. The chief exegete in the environmental field is M. E. Zimmerman. See e.g. 'Towards a Heideggerian *ethos* for radical environmentalism', *Environmental Ethics* 5, 1983, 99–131; 'The critique of natural rights and the search for a non-anthropocentric basis for moral behaviour', *J. Value Inquiry* 19, 1985, 19–43.

75. There are echoes here of the Gaia hypothesis. I sometimes feel that Heidegger was putting poetically what science has subsequently revealed but I expect to be told that I have an imperfect understanding of the depth of Heidegger's thought.

76. Quoted by L. Westra, 'Let it be: Heidegger and future generations', *Environmental Ethics* 7, 1985, 341–50, from Heidegger's *Basic Writings*, New York: Harper and Row, 1977, ed. D. F. Krell.

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80. Though we should not forget that F. Capra's *The Tao of Physics*, Berkeley, CA: Shambhala Press/London: Wildwood House, 1975, was a best-seller and there have been several imitators, such as G. Zukav, *The Dancing Wu Li Masters*, London: Fontana, 1979; R. Jones, *Physics as Metaphor*, London: Abacus Books, 1983.

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Population

In the late 1700s, Thomas Malthus predicted a grim future in which human population growth would outstrip the environment's capacity to produce food. The resulting social strains and environmental deterioration would generate chaos and social disintegration. Since then, researchers have continued to ponder the link between population and environmental processes. Malthus's ideas retain their allure. (He appears here in the contributions by Caroline Bledsoe, Fattoumatta Banja, and Allan G. Hill; Simon Dalby; and Lester Brown, Gary Gardner, and Brian Halweil.) Demography, however, includes interests in mortality, migration, health care, and life cycle processes, as well as fertility. As Fricke notes, anthropology's contribution to demographic studies is to show how culture and daily life experiences provide the context in which people make the decisions and choices which shape broader population changes (Fricke 1997).

The basis for a broader demographic approach in anthropology can be found in Ester Boserup's renowned theory of agricultural intensification and is illustrated by Sally Ethelston's report on connections between environment and health in urban Cairo. Boserup has been influential in the work of agricultural ecological anthropologists, such as Netting. Her thesis, that population density results in agricultural intensification, has implications for the large-scale migrations out of rural areas witnessed during the 19th and 20th centuries. Boserup's work furthermore speaks to questions of economic development raised in Section 3. In contrast, Ethelston's work in an urban setting makes for more pessimistic reading. She brings population issues into the policy realm by discussing the collective action she believes necessary to combat the combined problems of deteriorating environments, health standards, and population growth. Given that most population-environment research focuses on population growth, Ethelston raises the important question of whether measures to curb high birth rates work to liberate or further oppress women.

Students may detect some real differences between reporting styles and data collection techniques in this section. Brown et al.'s summary figures stand in contrast to Bledsoe's nuanced and intimate local knowledge of fertility practices. The numerical snapshots stand in contrast to complex ideas about what children mean to the families and communities who raise them. These reporting styles appeal to divergent audiences and themselves have an impact, separately from the information they convey. This section offers a sense of how information becomes transformed as authors promote their particular position to different audiences.

The global nature of population debates means that this section begins to open the question of global environmental issues. Simon Dalby takes on the global implications

of Malthusian thinking in his article, which serves both as this section's ethical and polemical reading.

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Some Perspectives and Implications

Ester Boserup

Agriculture in Europe and the United States has undergone a radical transformation in the last century. Scientific methods of cultivation have been introduced and mechanized equipment and other industrial products have become widely used.

On the background of this technical revolution of agricultural procedures in the already developed world, agrarian change in underdeveloped countries may seem trivial, and it is understandable that many economists should presume that in countries where agriculture has not yet reached the stage of scientific and industrial methods it is stagnant and traditional, almost by definition.

The preceding chapters should have shown that this view is unwarranted, and that in the supposedly immutable communities of primitive agriculture profound changes are in fact occurring.

Students of economic history have not failed to describe the successive changes within primitive agricultural systems, but this has largely passed unnoticed by economists. They tended to regard the existing methods of cultivation and systems of land use as permanent features of a given locality, reflecting its particular natural conditions, rather than as phases in a process of economic development. In accordance with this view, the causal explanation of differences in cultivation systems was supposed to be a matter for geographers to consider; and these would naturally be inclined to explain differences in agricultural methods in terms of climatic conditions, type of soil and other natural factors which were believed to remain uninfluenced by changes in the size of population. It is in the logic of this approach to expect that major increases of agricultural population within a given area must result in the emergence of a labour surplus on the land and a consequent pressure for migration to other regions or to urban areas.

Our investigation lends no support to this conception of an agrarian surplus population emerging as the result of population growth. We have found that it is unrealistic to regard agricultural cultivation systems as adaptations to different natural conditions, and that cultivation systems can be more plausibly explained as the result of differences in population density: As long as the population of a given area is very sparse, food can be produced with little input of labour per unit of output and with

virtually no capital investment, since a very long fallow period helps to preserve soil fertility. As the density of population in the area increases, the fertility of the soil can no longer be preserved by means of long fallow and it becomes necessary to introduce other systems which require a much larger agricultural labour force. By the gradual change from systems where each cultivated plot is matched by twenty similar plots under fallow to systems where no fallow is necessary, the population within a given area can double several times without having to face either starvation or lack of employment opportunities in agriculture.

Some economic historians, noting the process of gradual shortening of fallow with accompanying changes in methods in many rural communities, made the observation that these changes occurred in periods of increasing population. The mere observation of this relationship leaves us with the further question of whether the increase in population is the effect or the cause of the agrarian changes.

The empirical study of the historical sequence is not very helpful in answering this question. Changes in patterns of land utilization and in agricultural methods usually occur gradually over long periods, and the same is most often true of demographic changes. Therefore, it is often difficult or impossible to determine through historical research whether the demographic change was the cause or the effect of the changes in agricultural methods. In the absence of a clear answer from historical sources, many historians have been inclined to presume a line of causation conforming to Malthusian theory, with the agrarian change as the cause and the long-term demographic trend as the effect.

The present study attempts to approach from another angle this important question of what is cause and what is effect. The method is the indirect one of comparing labour costs per unit of output in the main systems of primitive agriculture. The conclusion drawn from this comparison was that the complex changes which are taking place when primitive communities change over to a system of shorter fallow are more likely to raise labour costs per unit of output than to reduce them. Therefore, it seems implausible to explain upwards changes in rates of population growth as a result of this type of agrarian change. It is more sensible to regard the process of agricultural change in primitive communities as an adaptation to gradually increasing population densities, brought about by changes in the rates of natural population growth or by immigration.

According to the explanation offered here, population increase leads to the adoption of more intensive systems of agriculture in primitive communities and an increase of total agricultural output. This process, however, can hardly be described as economic growth in the generally accepted sense of this term, since the proximate effect upon output per man-hour is to lower it. But sustained growth of total population and of total output in a given territory has secondary effects which—at least in some cases—can set off a genuine process of economic growth, with rising output per man-hour, first in non-agricultural activities and later in agriculture. Such secondary effects come about through two different mechanisms. On the one hand, the intensification of agriculture may compel cultivators and agricultural labourers to work harder and more regularly. This can produce changes in work habits which help to raise overall productivity. On the other hand, the increasing population density facilitates

the division of labour and the spread of communications and education. The important corollary of this is that primitive communities with sustained population growth have a better chance to get into a process of genuine economic development than primitive communities with stagnant or declining population, provided of course, that the necessary agricultural investments are undertaken. This condition may not be fulfilled in densely peopled communities if rates of population growth are high.

According to the theory propounded above, a period of sustained population growth would first have the effect of lowering output per man-hour in agriculture, but in the long run the effect might be to raise labour productivity in other activities and eventually to raise output per man-hour also in agriculture. In a development pattern of this kind, there is likely to be an intermediary stage where labour productivity in agriculture is declining while that of other activities is increasing. This period is likely to be one of considerable political and social tension, because people in rural areas, instead of voluntarily accepting the harder toil of a more intensive agriculture, will seek to obtain more remunerative and less arduous work in non-agricultural occupations. In such periods, large-scale migrations to urban areas are likely to take place and to result in hardening competition in urban labour markets. The flight from the land may reach such proportions that it precludes the necessary expansion of food production in the villages, with the result that the town population must carry the double burden of lacking employment opportunities and high food prices. Difficulties of this type have occurred in most developing countries in the past, and they have been dealt with in very different ways: some European countries went as far as to reintroduce rural serfdom in order to curb the drift of rural youth to the towns; others tried to counteract internal migration by legal restrictions, or to introduce agrarian reform as an incentive for people to remain in the rural areas.

In cases where the migrations from village to town at this stage of development are allowed to continue without restraint, the ensuing relative rise of food prices may provide the needed incentive for an intensification of agriculture and be followed by a rise of rural money wages which helps to keep migration within bounds.

An alternative to the acceptance of rising food prices is to allow the importation of food. Increased food imports at this stage of development is a means to avoid the political and social trouble in the urban areas which would be likely to follow rising prices of food in terms of urban wages. However, if the import of food contributes to prevent or retard the intensification of domestic agriculture, the inflow of rural labour to the towns may continue. The result may be a slack labour market in urban and rural areas, particularly in cases where the need to finance the food imports leads to measures which reduce employment opportunities in the urban areas.

In the past century, the pressure of population growth was mitigated in many underdeveloped countries by the possibility of sustained expansion of the production of tropical crops for exports. The rapid growth of both population and *per capita* incomes in many countries in the temperate zones created expanding markets for such crops at prices which were so high that cultivators, by changing over from food production for domestic consumption to production of export crops, could earn a subsistence wage or income with a smaller input of labour than would be required to obtain the same income by the production of food crops in intensive systems of agriculture.

Therefore, increasing numbers of the rising populations in many underdeveloped countries took to the cultivation of export crops.

The type of development just described is characterized by a sharp contrast between the sector producing for exports and the sector which continues to produce food for subsistence. The rising numbers in the export sector are consuming mainly food and non-agricultural goods imported from other areas. The stagnant or gradually declining numbers in the subsistence sector continue to produce their own food by long-fallow systems, have little division of labour and contribute little to the growth of urbanization, which is limited to one or a few centres of foreign trade.

World markets for tropical export crops are no longer expanding so quickly that they can provide sufficient outlet for the more and more rapidly growing rural populations in the tropical countries. These are faced with the choice between harder work in more intensive food production, or migration to urban areas. They seem in most cases to choose the latter solution in so great numbers that urban labour markets become oversupplied with unskilled labour, while the labour supply in rural areas is insufficient to allow the needed shift from long fallow to more intensive agriculture. It thus seems that now, as in the past, there is a choice between increasing food prices, food imports or direct government intervention, in one form or the other, against migrations from the countryside.

It might be objected that the recent revolution of agricultural techniques has changed the situation fundamentally in this respect and that an additional solution is now available, namely to modernize and increase food production by means of industrial input, mechanized equipment as well as chemical fertilizers. But in primitive rural communities in countries where food is cheap in terms of prices of industrial goods there appears to be little incentive to use industrial inputs in agriculture. Thus the possibility of stepping up agricultural output by the introduction of modern industrial inputs cannot be realized unless a rise in agricultural prices relative to those of industrial goods is allowed to take place.

This leads on to the final question: What are the implications of the present study for the possibilities of promoting economic growth in the underdeveloped parts of the world? Can history teach us anything for the future, or has it become irrelevant under modern conditions with the possibility of using scientific methods and industrial products in the agriculture of underdeveloped countries?

It is clear that this question cannot be answered by a reference to the fact that output per man-hour in agriculture increases by leaps and bounds when industrial methods are introduced in rural communities in already industrialized countries. Similar changes raise output per man-hour much less when introduced in underdeveloped countries where rural skills and rural communications remain at primitive levels. The modest increases in output per man-hour which can be obtained by the use of industrial products or scientific methods in such communities may not be sufficient to pay for the very scarce resources of skilled labour and foreign exchange which they absorb. It seems somewhat unrealistic, therefore, to assume that a revolution of agricultural techniques by means of modern industrial and scientific methods will take place in the near future in countries which have not yet reached the stage of

urban industrialization. It is not very likely, in other words, that we shall see a reversion of the traditional sequence, in which the urban sector tends to adopt modern methods a relatively long time before the agricultural sector undergoes a corresponding transformation. Past experience may therefore still have some relevance for the planning of agricultural growth in the underdeveloped world.

Beyond Malthus
Sixteen Dimensions of the Population Problem

Lester Brown, Gary Gardner, and Brian Halweil

The demographic prospect for individual countries has never varied more widely than it does today. In some nations, populations are projected to decline somewhat over the next half-century, while in others they are projected to more than triple. But are such increases realistic? Analysis of the population problem raises doubts as to whether the expected population doublings and triplings in scores of developing countries will, in fact, materialize.

To help assess the likelihood that the increases projected by the United Nations will actually occur, we turn to the concept of the demographic transition, formulated by Princeton demographer Frank Notestein in 1945. Among other things, its three stages help explain widely disparate population growth rates. In the first of the three stages, the one prevailing in preindustrial societies, birth rates and death rates are both high, essentially offsetting each other and leading to little or no population growth. As countries begin to modernize, however, death rates fall and countries enter stage two, where death rates are low while birth rates remain high. At this point, population growth typically reaches 3 percent a year—a rate that if sustained leads to a 20-fold increase in a century. Countries cannot long remain in this stage.[1]

As modernization continues, birth rates fall and countries enter the third and final stage of the demographic transition, when birth rates and death rates again balance, but at low levels. At this point, population size stabilizes. Countries rarely ever have exactly zero growth, but here we consider any country with annual growth below 0.4 percent to have an essentially stable population. Among the earliest nations to reach stage three were East Germany, West Germany, Hungary, and Sweden, which achieved stability during the 1970s.

All countries today are in either stage two or stage three. Some 32 industrial countries have made it to stage three, stabilizing their population size. (See Table 9.1) The other 150 or so countries, including most of those in Asia, Africa, and Latin America, are in stage two. Within this group 39 countries, those that have seen their fertility fall

<div align="center">

TABLE 9.1
Sixteen Countries with Zero Population Growth, 1998

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Country	Annual Rate of Natural Increase (percent)	Midyear Population (million)
Belarus	-0.4	10.2
Belgium	+0.1	10.2
Czech Republic	-0.2	10.3
France	+0.3	58.8
Germany	-0.1	82.3
Greece	0	10.5
Hungary	-0.4	10.1
Italy	0	57.7
Japan	+0.2	126.4
Netherlands	+0.3	15.7
Poland	+0.1	38.7
Romania	-0.2	22.5
Russia	-0.5	146.9
Spain	0	39.4
Ukraine	-0.6	50.3
United Kingdom	+0.2	59.1

SOURCE: See endnote 2.

to replacement level or below, are approaching stage three. These include China and the United States, which are each growing by roughly 1 percent a year.[2]

In mature industrial countries with stable populations, agricultural claims on the Earth's ecosystem are beginning to level off. In the European Union (EU), for example, population has stabilized at roughly 380 million. With incomes already high, grain consumption per person has plateaued at around 470 kilograms a year. As a result, EU member countries, now consuming roughly 180 million tons of grain annually, have essentially stabilized their claims on the Earth's agricultural resources—the first region in the world to do so. (See Figure 9.1) And, perhaps more important, since the region is a net exporter of grain, Europe has done this within the limits of its own land and water resources. Likewise, future demand for grain in both North America and Eastern Europe is also projected to remain within the carrying capacity of regional land and water resources.[3]

Not all countries are so fortunate. Over the next half-century, India's population is projected to overtake that of China, as it expands by nearly 600 million people, compared with just under 300 million for China. Whether India—already facing acute shortages of water—can avoid a breakdown of social systems in the face of such an increase in population pressure remains to be seen.

Although there are dozens of countries that now face a doubling or tripling of population size over the next half-century, three of the more populous ones stand out: Ethiopia, Nigeria, and Pakistan. (See Table 9.2) The current fertility rate in these countries ranges from just under six children per woman in Pakistan to nearly seven in Ethiopia. By 2050, water availability per person in each of these countries will be well below the minimum needed to satisfy basic food and residential needs.[4]

The question now facing the world is whether the 150 or so countries that are still in stage two, with continuing population growth, can make it into stage three by quickly reducing births. Over the next half-century, most countries where population

FIGURE 9.1
Grain Production and Consumption in the European Union, 1960–98

Million Tons
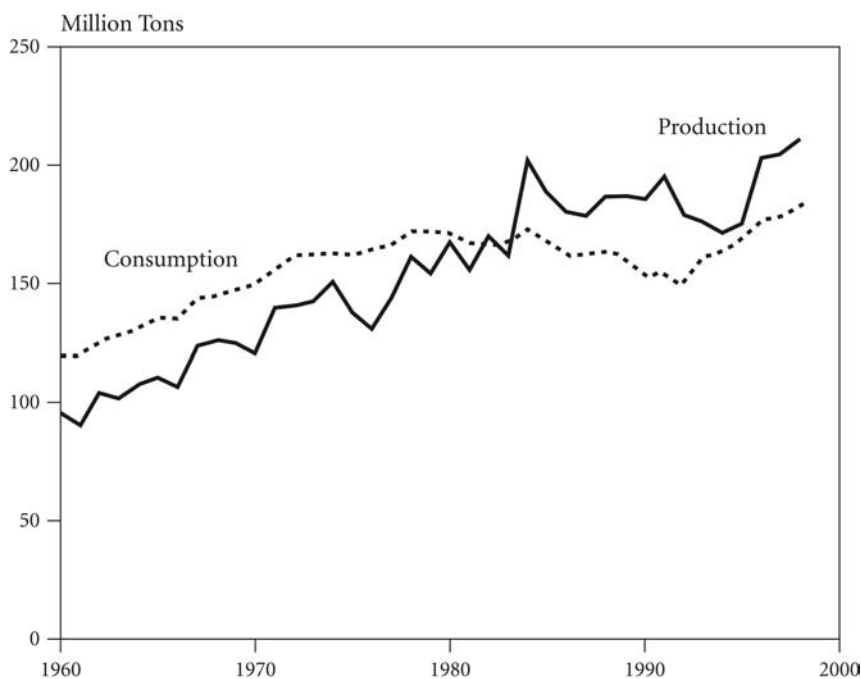
SOURCE: See endnote 3.

TABLE 9.2
Population in Selected Industrial and Developing Countries in 1998,
with Projections to 2050

Area	Population		Increase From 1998 to 2050	
	1998	2050		
	(million)		(million)	(percent)
Industrial Countries				
United States	274	348	+74	+27
Russia	147	114	-33	-22
Japan	126	110	-16	-13
Germany	82	70	-12	-15
France	59	58	-1	-2
United Kingdom	58	59	+1	+2
Italy	57	42	-15	-26
Developing Countries				
India	976	1,533	+557	+57
China	1,255	1,517	+262	+21
Pakistan	148	357	+209	+141
Nigeria	122	339	+217	+178
Brazil	165	243	+78	+47
Bangladesh	124	218	+94	+76
Ethiopia	62	213	+151	+244
Iran	73	170	+97	+133
Congo	49	165	+116	+237
Mexico	96	154	+58	+60
Egypt	66	115	+49	+74
Tanzania	32	89	+57	+178

SOURCE: See endnote 4.

growth is still rapid seem likely to break out of stage two, achieving the demographic stability of stage three. In these nations, the combination of falling fertility, increasing incomes, and rising educational levels will lead to population stabilization within the foreseeable future. Economic and social gains and the decline in fertility will reinforce each other. This can be seen most clearly in the developing countries of East Asia, such as South Korea and Taiwan, where successful early efforts to reduce fertility set the stage for the diversion of capital from rearing large numbers of children to investment in modernization overall. The resulting improvements in living standards then reinforced the trend to smaller families.

Countries that are already pressing against the limits of land and water resources and that are faced with a projected doubling or tripling of their population may face falling living standards that will further reinforce the prevailing high fertility. This reinforcing mechanism, referred to by demographers as the demographic trap, could drive countries back into stage one.

Nations in stage two where population is still growing rapidly will thus either shift quickly to smaller families or eventually fall back into stage one of the demographic transition when their economic and social systems break down under mounting population pressure. One or the other of the two self-reinforcing cycles will take over. There are no other options. Among the many countries at risk of falling back into stage one if they do not quickly check their population growth are Afghanistan, Egypt, Ethiopia, Ghana, Haiti, Honduras, India, Myanmar, Nigeria, Pakistan, the Sudan, Tanzania, and Yemen.

Governments of countries that have been in stage two for several decades are typically worn down and drained of financial resources by the consequences of rapid population growth, in effect suffering from demographic fatigue. This includes trying to educate ever growing numbers of children reaching school age, creating jobs for the swelling numbers of young people entering the job market, and dealing with the various environmental problems associated with rapid population growth, such as deforestation, increased flooding and soil erosion, and aquifer depletion. With leadership and fiscal resources stretched thin in trying to cope with so many pressures at once, governments are often unable to respond effectively to emerging threats such as new diseases, water shortages, or food shortages. This is perhaps most evident in the inability of many governments to cope with new diseases, such as AIDS, or the resurgence of more traditional diseases, such as malaria or tuberculosis.

If these threats are not dealt with, they can force countries back into stage one. For several African countries with high HIV infection levels, this is no longer a hypothetical prospect. Although industrial nations have been able to control the spread of the disease, holding infection levels under 1 percent of their populations, governments in many developing countries—already overwhelmed by the pressures just described—have not been able to do so. For example, in Zimbabwe, a country of 11 million people, more than 1.4 million of the adult population of less than 5.6 million are infected with HIV. As a result of this 26-percent adult infection rate and the inability to pay for costly retroviral drugs needed to treat those with the disease, Zimbabwe is expected to reach population stability in the year 2002 as death rates climb to offset birth rates. In

effect, it will have fallen back into stage one, marking a tragic new development in world demography.[5]

Another situation that could easily become unmanageable is life-threatening shortages of food due to either land or water shortages or both. For example, Pakistan and Nigeria face an impossible challenge in trying to feed their future populations. The projected growth for Pakistan to 357 million by 2050 will reduce its grainland per person from 0.08 hectares at present to 0.03 hectares, roughly the strip between the 10-yard markers on a football field. Nigeria's projected growth will reduce its grainland per person from the currently inadequate 0.15 hectares to 0.05 hectares.[6]

As India's population approaches the 1 billion mark and as it faces the addition of another 600 million people by 2050, it must deal with steep cutbacks in irrigation water. David Seckler, head of the International Water Management Institute in Sri Lanka, the world's premier water research body, observes in a new study that "the extraction of water from aquifers in India exceeds recharge by a factor of 2 or more. Thus almost everywhere in India, fresh-water aquifers are being pulled down by 1–3 meters per year." Seckler goes on to speculate that as aquifers are depleted, the resulting cutbacks in irrigation could reduce India's harvest by 25 percent. In a country where food supply and demand are precariously balanced and where 18 million people are added to the population each year, the cutbacks in irrigation that are in prospect could drop food supplies below the survival level, creating a national food emergency.[7]

As noted earlier, U.N. demographic projections do not reflect the ecological deterioration and social breakdown of the sort that has led to the ethnic conflicts plaguing countries such as Rwanda and Somalia. Somalia, for example, is still treated by U.N. demographers as a country, but in reality it is not. It is a geographical area inhabited by warring clans—one where ongoing conflict, disintegration of health care services, and widespread hunger combine to raise mortality.

Exactly how the stresses of social disintegration will manifest themselves as the needs of a growing population outstrip the resource base varies from country to country. For example, Rwanda's 1950 population of 2.5 million had reached roughly 8.5 million by early 1994. A country whose agricultural development was once cited as a model for others in Africa saw its grainland area per person shrink to a meager 0.03 hectares per person, less than one third as much as in Bangladesh. In this society, which is almost entirely rural with no industrial cities to migrate to, cropland per person has shrunk to the point where it will no longer adequately feed many of those living on the land, giving rise to a quiet desperation. The resulting tension can easily be ignited—as it was when a long-standing ethnic conflict between Tutsis and Hutus broke out again in 1994, leading to the slaughter of a half-million Rwandans, mostly Tutsis.[8]

The press focused on the long-standing conflict, which was real, but what was not reported was the extraordinary population growth over the last half-century and how it was affecting the hope of Rwandans for a better future. Desperate people resort to desperate actions.

As demographic fatigue sets in and the inability of governments to deal effectively with the consequences of rapid population growth becomes more evident, the resulting

social stresses are likely to exacerbate conflicts among differing religious, ethnic, tribal, or geographic groups within societies. Among these are differences between Hindus and Moslems in India; Yorubas, Ibos, and Hausas in Nigeria; Arabs and Israelis in the Middle East; Hutus and Tutsis in Rwanda and Burundi; and many others. Aside from enormous social costs, these spreading conflicts could drive countless millions across national borders as they seek safety, putting pressure on industrial countries to admit them as political refugees.

As pressures on the Earth's resources build, they may also lead to international conflicts over shared water resources, oceanic fisheries, or other scarce resources. Nowhere is the potential conflict over scarce water more stark than among the three principal countries of the Nile River valley—Egypt, the Sudan, and Ethiopia. In Egypt, where it rarely rains, agriculture is almost wholly dependent on water from the Nile. Egypt now gets the lion's share of the Nile's water, but its current population of 66 million is projected to reach 115 million by 2050, thus greatly boosting the demand for grain, even without any gains in per capita consumption. The Sudan, whose population is projected to double from 29 million today to 60 million by 2050, also depends heavily on the Nile. The population of Ethiopia, the country that controls 85 percent of the headwaters of the Nile, is projected to expand from 62 million to 213 million. With little Nile water now reaching the Mediterranean, if either of the two upstream countries, Sudan or Ethiopia, use more water, Egypt will get less.[9]

FIGURE 9.2
World Population Projections under Three Variants, 1950–2050
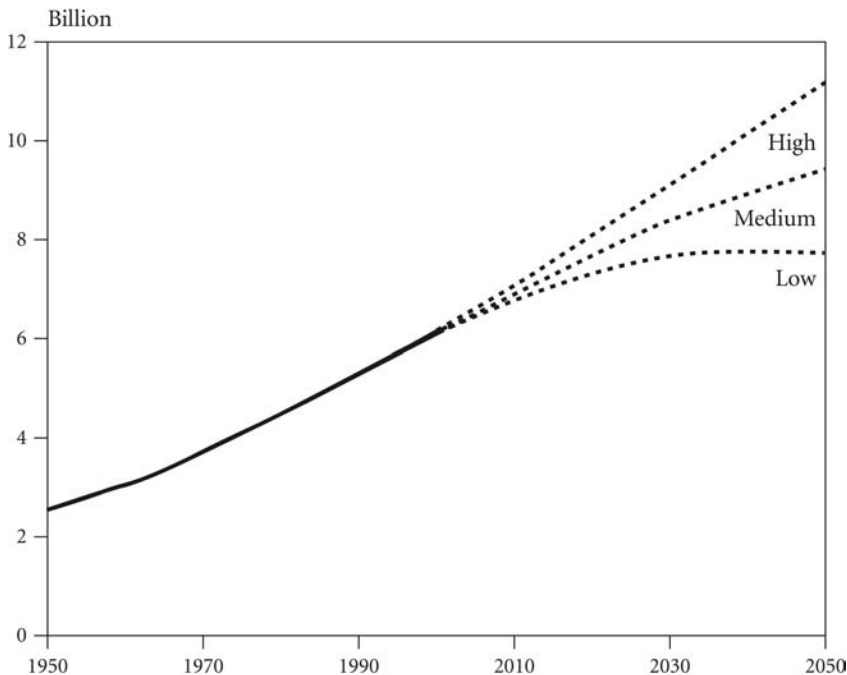
SOURCE: See endnote 10.

As we look to the future, the challenge for world leaders is to help countries maximize the prospects for breaking out of stage two of the demographic transition and moving into stage three before time runs out and nature brutally forces them back into stage one. In a world where both grain output and fish catch per person are falling, a strong case can be made on humanitarian grounds for an all-out effort to stabilize world population. There is nothing inevitable about a projected mid-century population of 9.4 billion. We can choose to move to the lower trajectory of the three U.N. projection scenarios, which has world population stabilizing at 7.7 billion by 2050. (See Figure 9.2) This would reduce the number to be added by 2050 from 3.3 billion to a more manageable 1.7 billion.[10]

What is needed, to use a basketball term, is a full-court press—an all-out effort to lower fertility, particularly in the high-fertility countries, while there is still time. We see four key steps in doing this: undertaking national carrying capacity assessments to help governments and the public at large to better understand the urgency of stabilizing population, filling the family planning gap, educating young women, and adopting a worldwide campaign to stop at two surviving children.

NOTES

1. Frank Notestein, "Population—The Long View," in P.W. Schultz, ed., *Food for The World* (University of Chicago Press: 1945); Warren Thompson, "Population," *American Journal of Sociology*, vol. 34, no. 6, 1929.

2. Table 9.1 from Population Reference Bureau (PRB), "1998 World Population Data Sheet," wall chart (Washington, DC: June 1998).

3. Figure 9.1 from ibid., and from U.S. Department of Agriculture (USDA), *Production, Supply, and Distribution (PS&D)*, electronic database, Washington, DC, updated August 1998; Mark W. Rosegrant and Claudia Rihgler, "World Food Markets into the 21st Century: Environmental and Resource Constraints and Policies," revision of a paper presented at the RIRDC-sponsored plenary session of the 41st Annual Conference of the Australian Agricultural and Resource Economics Society, Queensland, Australia, 22–25 January 1997.

4. Table 9.2 from United Nations, *World Population Prospects: The 1996 Revision* (New York: 1996), and from PRB, op. cit. note 2; Tom Gardner-Outlaw and Robert Engelman, *Sustaining Water, Easing Scarcity (A Second Update)* (Washington, DC: Population Action International, 1997).

5. Joint United Nations Programme on HIV/AIDS (UNAIDS) and WHO, *Report on the Global HIV/AIDS Epidemic* (Geneva: June 1998); Lawrence K. Altman, "Parts of Africa Showing H.I.V. in 1 in 4 Adults," *New York Times*, 24 June 1998.

6. USDA, *PS&D*, op. cit. note 3.

7. David Seckler, David Molded, and Randolph Barker, "Water Scarcity in the Twenty-First Century" (Colombo, Sri Lanka: International Water Management Institute (IWMI), 27 July 1998).

8. USDA, *PS&D*, op. cit. note 3.

9. Sandra Postel, *Last Oasis*, rev. ed. (New York: W.W. Norton & Company, 1997).

10. Figure 9.2 from United Nations, op. cit. note 4.

Reproductive Mishaps and Western Contraception
An African Challenge to Fertility Theory

Caroline Bledsoe, Fatoumatta Banja, and Allan G. Hill

Kaddy Sisay, a 30-year-old remarried divorcée, fell into a sample of women our sur-veyors interviewed in rural Gambia every month for 15 months during 1993–94. In this population where people so intensely desire children, Kaddy had carried at least four pregnancies. Three were with her first husband. The firstborn, a daughter who died before age three, was followed by two stillbirths. At this point Kaddy's marriage ended, very likely a consequence of her failure to produce children for her husband. Remarrying as the marginal second wife of a man already married to a younger woman with three children, Kaddy became pregnant for the fourth time and bore a son. Our surveyors began to interview her when the baby, still breastfeeding, was about 17 months old. Four months later, this child died. Left in a precarious marriage with no children to support her in later life, Kaddy, although she expressed a strong desire for more children, did the last thing we might expect: she began a long course of Depo-Provera injections.[1]

This example presents three apparent anomalies. We perceive high-technology Western contraceptives as being out of place: being put to use in a country whose rural inhabitants appear to have radically different ideas about reproduction from those in the West. We also see contraceptives as being used at a point in time, and for a duration, in which "child spacing" can hardly characterize the motive. Finally, we see contraceptive use in an unexpected marital context: by a wife whose future conjugal life seems to depend crucially on her ability to produce children. It is small wonder that by the fourteenth month of our survey, Kaddy's comment, recorded by the sur-veyors, was, "I am suffering in my marriage."

An outsider's first reaction might be to attribute these reported actions to data error or statistical aberration. Yet Kaddy's case, as startling as it sounds to the demog-rapher's trained ear, is not unusual for women in such situations. In our 1992 baseline survey of 2,980 women who had ever been pregnant, 150 women were using Western contraceptives. Of these, 18 percent were doing so after a reproductive mishap—a miscarriage, stillbirth, or the loss of a neonate or a young child. This 18 percent is all

the more surprising since, in a "nonlimiting" population whose members value high fertility, no one in circumstances like Kaddy's should be using any contraceptive method, at least according to the conventions by which fertility in Africa is usually analyzed. These findings on contraceptive use following reproductive mishaps, without apparent regard for its likely temporal penalties for fertility, fly in the face of every major demographic theory that has been advanced to explain fertility behaviors in Africa. They contradict any sort of child-replacement hypothesis; they also reflect efforts to "control" fertility under circumstances where a target family size can hardly have been reached. They certainly reflect circumstances that our project's earlier conclusions about child spacing as the basis for contraceptive use (Bledsoe et al. 1994) failed to consider: there is *no* child to space. Such observations seem to make no sense in a population so desirous of children.

This article shows that these very small numbers are the most striking edges of a much larger body of evidence. They suggest a convergence between conventional demographic understanding of the social and biological dynamics of high fertility and a very different framework of interpretation. The key question is not when fertility begins, the boundary that draws most demographic attention in high-fertility populations, but how it ends. We show that rural Gambians see fertility as limited by a woman's eroding bodily capacity to bear a child safely over successive pregnancy outcomes. This capacity wears out less with the passage of time than with the cumulative effects of wear and tear on the body, particularly in the wake of obstetric traumas. Since the pace of this decline can be slowed with "rest" between pregnancies (that is, the creation of recuperative space), and since time spent in "resting" is considered largely irrelevant to ultimate child numbers, it is not surprising that the most traumatic health assaults, such as those that reproductive mishaps reflect or intensify, produce the strongest contraceptive responses.

This alternative view of reproduction and aging, which we term "body resource expenditure," is consistent with findings from elsewhere in rural sub-Saharan Africa on contraceptive use, marriage, birth intervals, and men's reproductive desires. This view also appears to have figured significantly in other times and regions. It draws support from every discipline that has touched on reproduction in Africa—demography reproductive biology, medicine, anthropology, art, literature—each of which would probably claim the findings as its own "common sense": knowledge that seems so obvious it scarcely bears stating. Yet none has acknowledged this alternative view of reproduction and aging as a basis either for interpreting intentional behavior or for carrying out concerted analysis.

Understanding this alternative view requires looking through a cultural lens not only at reproduction in rural Gambia but also at the interpreting frameworks by which the population sciences have come to analyze high fertility.[2] As most of the world settles into a regime of low fertility, the science of the study of high fertility is disappearing rapidly; international medical journals now describe the predominant problems faced by older women as those of cancer and infertility. As a result, even in Africa demographic research now tends to treat contraceptives as devices to limit the number of live births, with maternal health improvements being seen as a byproduct, and contraceptive users are seen as a group apart: educated, autonomous, and nonfatalistic.

We show, however, that in contexts with high levels of reproductive morbidity and mortality, a *health* model, not a demographic one, dominates people's thinking about contraception, superseding by far any specific worries about family size. The fact that a woman's health and life are at stake—to say nothing of the wellbeing of the extant children who depend on her—means that the medicinal effect of contraceptives, which have the potential to heal by allowing recovery from traumatic pregnancy and delivery experiences, may loom larger than their fertility-reduction potentials.

It is important to stress that we are concerned here neither with fertility levels nor with fertility decline,[3] but with the *intents* with which people use contraceptives and the patterns of contraceptive use that these intents produce.[4] We see women as pointing by their contracepting actions to a dimension of human biology that has been disappearing from Western views of this matter and to ways in which they seek to shape biological outcomes. We first lay out a series of assumptions upon which contemporary analyses of fertility in developing countries have been grounded, including our project's own initial child spacing theme. Turning to some of the inconsistencies that began to emerge in the findings, in the rest of the article we set forth the alternative vision and adduce social and cultural evidence for it.[5]

Key Assumptions in Studies of Contraception and Fertility

Most Western women, when asked how many children they want, produce a clear numerical response. By contrast, Gambian women frequently respond, "Whatever God gives me" or "Ask my husband" (for a related discussion, see van de Walle 1992). Indeed, the testimonies of subfertile women suggest that they are far from happy with their divine allotment, while those women who received a bounteous number probably would have liked even more. In such populations, the most obvious question is not the one that policymakers typically ask: "Why do they want so many children?" Rather, it is "Why don't they have more?"[6] For contemporary studies of developing countries, the answer to this question has centered on two assumptions: (1) live births, if not surviving children, are the only meaningful units of fertility analysis, and (2) time imposes the ultimate check on both completed fertility and fecundability. Expressed in the numerator as live births over a specified amount of time in the denominator, the elements in this expression are set against the countdown to what is seen as the ultimate limit to fertility: menopause.[7] These convictions are so taken for granted that they are seldom articulated: certainly they infused every aspect of the Gambian project's original formulation.

The Study

Our study took place in the North Bank area of rural Gambia. Its first phase consisted largely of a 1992 baseline fertility survey, carried out in 40 villages, of 2,980 women of reproductive age. The study also included several hundred pages of open-ended interviews and field notes. Like most of sub-Saharan rural Africa, the population of rural

Gambia is one that demographic convention would confidently label a natural fertility population. In our study region, ever-married women had one of the highest total fertility rates in the world, 7.5 children per woman, with no signs of major change over a long period.[8] Birth intervals averaged around 2.5 years, and contraceptive use rates were very low. Only 5 percent of women under age 45 were using a Western method of contraception, mostly oral contraceptives and Depo-Provera. (National levels, which include urban areas, are slightly higher; Republic of The Gambia 1993.) As for methods usually termed "traditional," few women report using herbs. Far more use "juju," a small leather pouch sewn tightly around pieces of paper containing secret texts from the Qu'ran. There is widespread skepticism about the efficacy of juju, but women readily use it if nothing else is available or if other methods fail or cause complications. Abstinence is frequently reported as a contraceptive measure, although "avoiding the husband" (the way our survey phrased the query) often consists simply of a reduction in the frequency of sexual "contacts," so as to reduce the risks of a mistimed conception. A few larger towns have hospitals that can perform cesarean sections. Twenty-one women in our 1992 sample (1 percent) reported that they had been sterilized surgically, a procedure that can now be performed at the regional and district health center, with the husband's permission.

Members of the three major ethnic groups in the region (44 percent Mandinka, 36 percent Wollof, and 20 percent Fula) engage in agriculture and herding; only 3 percent of ever-married women had been to school. Most women were married (88 percent), 58 percent of them polygynously, and most had married quite early, around age 16, though the beginning of their sexual relations may be delayed for another year or so until the young wife is "transferred" formally to her husband's compound. Mean age at first birth is 18.4 years. In their husbands' compounds, women seek to establish their security and to gain a competitive edge over present and future co-wives and sisters-in-law by bearing a number of children, especially sons, who will retain rights of residence and inheritance in the compound and will eventually take over its leadership roles. Once marriage begins, birth intervals take on a classic natural fertility pattern of around 2.5 years (A. Hill 1997; C. Hill 1994). After her reproduction is finished, a woman usually tapers off the frequency of sexual intercourse or ends it altogether, an event that may or may not coincide with becoming a grandmother, though terminal abstinence is usually explained in these terms.

The first phase of our study established that birth intervals in this high-fertility population may be regular, but they are hardly natural, at least in the sense of being untouched by human intentionality. The study also indicated that it was less useful to see contraceptive users in static terms, as a discrete group whose background characteristics set them apart, than as the tip of a moving wave of numerous *temporary* users who were simply using contraceptives for small slices of time to space their births—especially in cases where women deemed that their fecundity had resumed before their child was ready to be weaned. Most "acceptors" rapidly, and predictably, became "non-acceptors" (and vice versa) over the sequence of pregnancy, lactation, and weaning. The rationale given in virtually all cases was not an intent to limit births but the wish to protect the health of the children and the mother (Bledsoe et al. 1994; see also Lorimer 1954; Caldwell and Caldwell 1981; and Greene, Bankole, and Westoff 1997).

Women's efforts to monitor birth intervals and to space births at safe intervals are so strong, because of both individual volition and fear of social sanction, that one might well conclude that birth intervals themselves, not numbers of children, are the focus of the calculus of conscious choice (cf. Coale 1973: 65).

The second phase of our study was intended as a time to fan out the investigation in a more open-ended fashion, to enrich the information on child spacing and contraceptive practice. Its principal instrument was a 15-month multi-round survey, conducted in 1993 and 1994, administered each month to some 270 women in eight of the 40 villages surveyed in the first phase who had had a pregnancy in the last three years.[9] This multi-round design was employed to ascertain changes in postpartum sexual, reproductive, and contraceptive patterns more accurately than a cross-sectional survey would allow. The rounds contained a core fertility questionnaire, including quantifiable questions and several open-ended follow-up questions, and a longer open-ended question that varied each month.

Our analytical effort at this point was enhanced by the use of a computer software program, Epi Info, whose data entry and analysis features can be exploited for exploratory analysis in ways that exceed those of a typical statistical program. They do so by allowing quantitative data to be sorted and scrutinized in several ways, and against the template of the survey form into which individual women's answers can be read. Epi Info can also juxtapose open-ended commentary as variables alongside the quantifiable responses, allowing people to explain in their own words their answers to key questions. For example, the yes/no question "Last month did you want to get pregnant?" can be followed by "Please explain"; and "What means to avoid pregnancy did you try last month?" can be followed by "Why did you use this method [or nothing]?" The cases can then be sorted by age, number of pregnancies, or type of birth control, and the transcribed explanations can be studied. The combined effects of commentary variables plus quick access to full view of all the questions facilitate a search for unanticipated associations among variables.

Reproductive Mishaps and Contraceptive Use

The project's second phase, because of its intense focus, brought to light some inconsistencies in the earlier results. One challenge was to better understand differing male reactions to contraceptive use. Throughout sub-Saharan Africa, men have a longstanding reputation as obstructing women's use of family planning. Yet the men in our surveys were hardly uniform on this question. Some men expressed moral outrage at the notion of family planning; and stormy arguments can arise when a husband discovers his wife's secret cache of tablets or hears from an indignant older female relative that his wife was seen in the family planning clinic. Other men were not only enthusiastic backers of their wives' contraceptive use; they saw *themselves* as "spacing" births by agreeing to abstinence, by using condoms, or even by taking their wives to the village health worker to obtain pills. Still, if contraceptives were simply being used to ensure children's health by safe birth spacing, there should be no male opposition to contraceptive use.

The two areas containing the most striking inconsistencies, however, were those that have remained farther from the gaze of population studies: the behavior of women nearing the end of reproductive life and the behavior of those who had experienced a reproductive mishap.

The early reproductive years have attracted the most demographic attention because of the fertility implications of early marriage among a highly fecund age group (e.g., National Research Council 1993b). Older women's low fertility rates, whether produced by declining fecundity or by terminal abstinence, have almost completely marginalized this group as an object of interest in high-fertility populations. Their behaviors and commentaries diverged far from what investigators might expect in such a population.

As either a natural fertility or a child spacing framework of analysis would anticipate, many women were anxious to resume childbearing around weaning time as long as they could avoid overlapping children, one in the womb and the other nursing. This definition of child spacing followed the most salient local usage, although it departed from the more standard one: the use of contraceptives now although more children are wanted later (e.g., National Research Council 1993a). Among the women with weaned children whom we interviewed in monthly rounds, those who stated that they did not want to be pregnant at the moment were older (31.9 years) than those who did (29.9) (N = 659; p <.01). Clues to this older/younger distinction were found in the expanded commentary responses. When asked, "Are you trying to take a 'rest' between your births?" (that is, to create longer spaces between weaning one child and conceiving the next), young women (under age 25 in this particular sample) offered comments like these:

— I love having children.
— My husband wants more children.
— I want more children so I want as soon as my child is weaned to get pregnant one month after weaning.
— I did not reach the age of delaying my pregnancy because I only have 3 children.

On the other hand, what stood out in the responses of many older women, even among those wanting more children, was a determination to "rest": to slow the pace of childbearing by delaying a new pregnancy past the point when the previous child is weaned. These women were in their mid-30s or older:

— I want to delay the next pregnancy because I am weak and want to wait until I have a little strength again.
— I don't want to have a child anymore. I want to rest now and take care of my present children.
— My womb is now slight [weak, thin] and I delivered my present child in [the capital of] Banjul [i.e., a high-risk case].
— I am not well.

As such responses suggested, young women, with their youthful reserve of strength and health, seem to recover quickly from a birth. In contrast, many older women, though their fecundity might be ebbing, were actively trying to *create* wider birth

intervals than child health alone demanded. Finding their strength increasingly hard to regain after each successive birth, they expressed fears of the rising health risks that can accompany high-parity childbearing: complications of labor, hemorrhage, and death. Whereas younger women preferred pills and traditional contraceptives that did not appear to jeopardize their fertility, older women were much more frequent users of the long-lasting Depo-Provera. They also spoke with considerably more favor about the prospects of the husband marrying a co-wife than did younger ones; many older women took matters into their own hands to launch the search for a new wife for a diffident husband.[10]

While "child spacing" was beginning to erode as a satisfactory explanation of the project's findings on use of contraception, one of the most obvious new inconsistencies surrounded the linguistic distinction between "old" and "young." Many women who were only in their mid- to late 30s reported in the 1992 survey that they were "too old" to have another child. While such reports might be explained as indicating cases of premature terminal sterility, several of these "too-old" women were having regular menstrual periods and a number were using long-term contraceptives. Several were even breastfeeding at the time of the survey. Such responses suggested that Western concepts about age and reproduction in a high-fertility society bore little resemblance to the forces at work here.

Older women, then, were more anxious than younger ones to stop or delay childbearing by using effective, long-acting contraceptives, and men sometimes manifested outrage at what seemed to be women's efforts to ensure the health of their children. But the domain of inconsistencies that posed by far the most troublesome stumbling block for the child spacing model of contraception was the fact that in a number of cases, there *was* no last child. Selecting only users of Western contraceptives in our multi-round sample and examining their characteristics and comments drew attention to women who were contracepting in the wake of a reproductive mishap. Such cases had been ignored in the earlier phase of the project by adherence to prevailing disciplinary practice, which counts only live births as significant data and focuses on intervals in which a child has survived.

Taking women under age 45 in the 1992 survey whose last pregnancy had ended after 1987 (within the last four-plus years; N = 1,756), Figure 10.1 displays patterns of contraceptive use (Western or traditional) according to the status of the woman's last pregnancy: a child currently breastfed, weaned, or deceased; or an outcome other than live birth. The results are displayed in histogram format to convey how very small are the numbers of women reporting mishaps compared to other women.

Among the most numerous group, breastfeeding women, just under 6 percent were using Western contraception; another 6 percent were using traditional contraception. Among women whose last child was weaned, 7.6 percent were using Western contraceptives, probably those who, as we saw in the quotes above, were "tired" and wanted to "rest". The bars of central interest, however, are the two small sets on the right. They show not only that there were cases of contraception after reproductive mishaps but that the proportion of such cases was unexpectedly high, particularly after miscarriages and stillbirths. The proportion of women using some form of contraception in the wake of a miscarriage or stillbirth (nearly 14 percent in all) was greater than that

FIGURE 10.1
*Women under age 45 using Western or traditional contraception according to the status of
last pregnancies ending January 1988–April 1992*
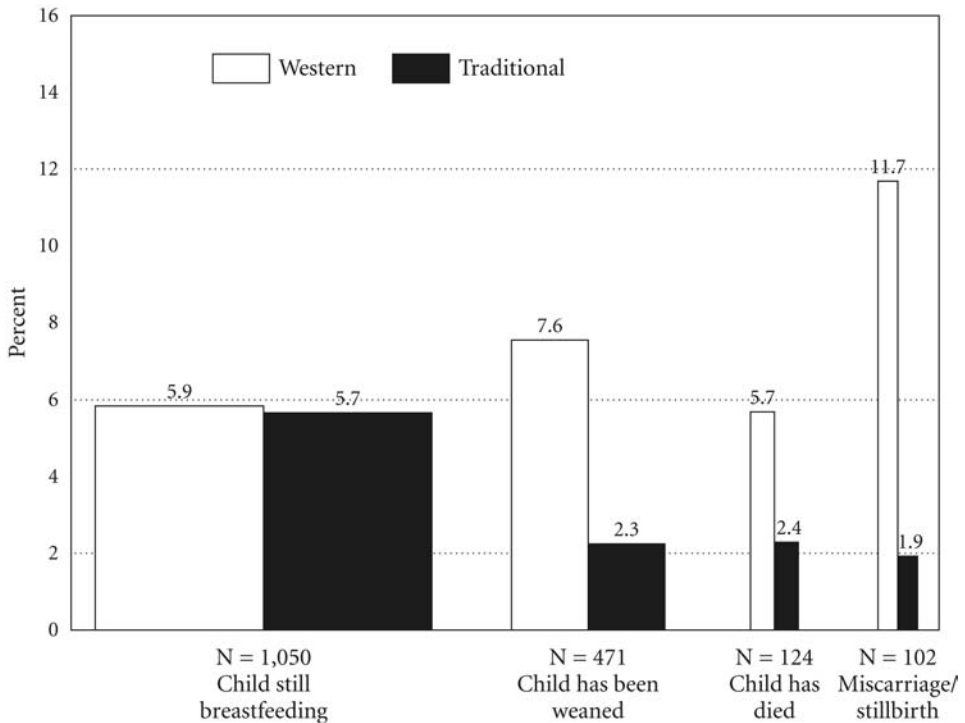
for any other group, including the women using contraceptives to avoid pregnancy during breastfeeding, the only pattern of contraceptive use one might have expected to find under our original definition of child spacing. Given our emphasis on the tight time frames in which contraceptive activity usually occurs, the four-plus-year interval to which the data shown in Figure 10.1 refer is somewhat longer than the "normal" birth interval sequence. Yet even with a shorter time window up through 1990, miscarriages and stillbirths remain consistently the most common post-pregnancy context for contraceptive use, never descending below 11 percent. The methods these women were using are even more telling. While half of the breastfeeding women who were using any method were using Western contraceptives, very few women contracepting after a miscarriage or stillbirth were relying on traditional measures like juju or herbs. Like Kaddy Sisay, whose case introduced this article, they were using strong, "effective" methods;[11] the proportion of Western contraceptive users among women whose last pregnancy ended in a miscarriage or stillbirth, almost 12 percent, exceeds that associated with any other outcome.

Figure 10.2 examines the phenomenon from another angle. Removing all constraints of age and time elapsed since the end of the last pregnancy, it shows that at each number of pregnancies the percentage of women with at least one completed pregnancy (N = 2,466) who are using Western contraceptives is consistently higher

FIGURE 10.2

Percentage of women using Western contraceptives by prior experience of live births versus miscarriages/stillbirths
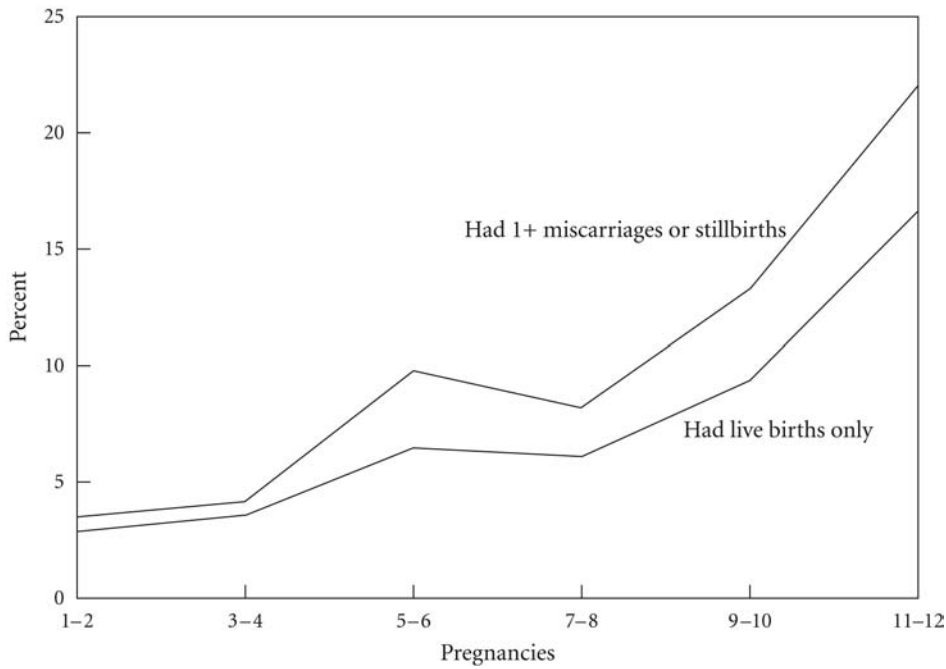
source: North Bank survey, 1992

among those who have had one or more miscarriages or stillbirths than among those who had only live births. Though separated at the low pregnancy numbers by less than one percentage point, the disparity rises to 6 percentage points by pregnancy numbers 11 to 12.

Figure 10.3, taking only women who have had two or more pregnancies, the last of which produced a child that is still alive (again free of age and time constraints), shows that the effects of miscarriage or stillbirth reverberate throughout reproductive life. Among women with few pregnancies, those whose last pregnancy resulted in a child that is still alive are more likely to be using a Western contraceptive if they had only live births than if they had one or more miscarriages or stillbirths. Among women with four or five pregnancies, however, the pattern shifts decisively. Even though women with one or more miscarriages or stillbirths are likely to have fewer surviving children than those whose pregnancies all resulted in live births, women with any outcomes other than live birth are more likely to be using Western contraceptives than those with only live births. Like the previous figure, this one suggests that the effects of such events on contraceptive use, whether they occurred recently or in the distant past, operate with increasing intensity as the number of pregnancies rises.

Although the patterns are both clear and consistent, the actual numbers, especially of women reporting that their last pregnancy ended in a miscarriage or stillbirth, are very small. Once the effects of other factors such as age and number of pregnancies

FIGURE 10.3
Percentage of women whose last child still alive using Western contraceptives by prior experience
of live births versus miscarriages or stillbirths
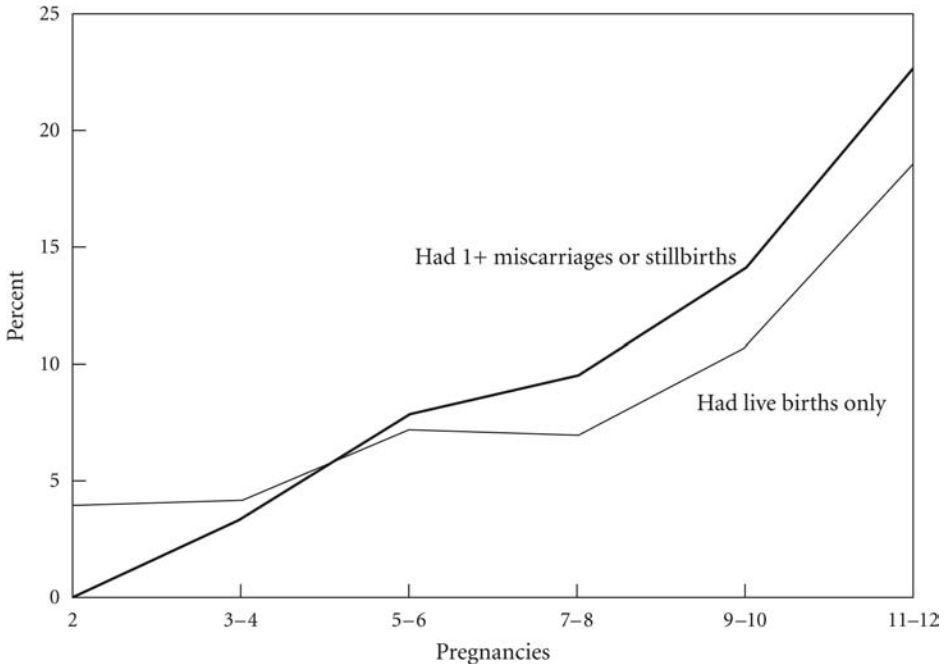
SOURCE: North Bank survey, 1992; women with 2+ pregnancies.

are controlled, logistic regression analysis reveals no significant differences in the type of contraceptive use between women who have had a miscarriage or stillbirth and those who have had only live births. Yet although the small number of cases could be confounding these results, the fact that anyone in this population was contracepting after such an event warrants investigation. Out of the 2,980 women in the 1992 survey, only 25 out of the 1,823 whose pregnancies had ended within the last four years were using some form of contraception after experiencing a mishap.

Conventional fertility analysis, assuming contraceptives to be methods for limiting the number of children (and determining that there is no last child in these cases), might suggest that these women have reached a desired number and are trying to stop childbearing. However, very few of these contracepting women have particularly successful fertility records. Out of their collective 149 pregnancies, only 53 percent have survived as living children. Only six women have more than four surviving children—five of these women aged 40 years or older. Out of the 24 women with two or more pregnancies, 17 had lost at least one other pregnancy besides the last. Yet even among these most unlikely of contraceptors, several stand out: (1) the seven women with the last two or more immediately preceding pregnancies lost, six of whom were using a Western, rather than a traditional, contraceptive; (2) one of the 25-year-olds, using Depo-Provera, who had lost all four of her last pregnancies; only her first child had survived; (3) a 36-year-old, also on Depo-Provera, with eight pregnancies, seven of

which were lost, including the last two; (4) the two youngest women, ages 18 and 19, both with no surviving children. The 19-year-old was one of nine women in the whole survey using two Western contraceptives simultaneously and by far the youngest; she was also the only woman in the survey to be using an IUD.

Although some of the older women with high numbers of pregnancy losses command the most immediate attention, the most unexpected may be these last two women, both under age 20. Together, they comprised two out of the only three teenagers in the entire survey (the total number of women below age 20 was 589) who were using Western contraceptives;[12] the third teenager was breastfeeding a baby.

Why Focus on Such Anomalies?

Despite the problem of small numbers, similar increases in contraceptive use after miscarriage or stillbirth occur throughout the data sources: the monthly rounds, the 1994 followup survey, and case material on women who were not from the study area. Still, most women in our study population are not currently using contraceptives, and most pregnancies do not end in mishap. Why, then, turn attention to such anomalies? The answer is that they shed new light on the logic that underlies postpartum fertility behaviors in general. The key lies in the power of the counterintuitive logic itself: if contraceptives are being used simply for child spacing, to ensure an adequate period of breastfeeding before weaning, then there is no reason why they should be used after a reproductive mishap.[13] Women who were trying to have a child but failed should be most anxious to start again and the least likely to be using any contraceptives, especially very "effective" ones. Rather than seeing these anomalies as statistical "proof"— which they are not—they should be seen as highlighting the aberrations, almost any one of which should call into question aspects of the dominant theory concerning child spacing and contraceptive use. The fact that this contraceptive behavior is occurring *more* frequently after reproductive mishaps than among women with other pregnancy outcomes should be grounds for a major rethinking.

The post-mishap contraception cases, along with the other anomalies highlighted above that *are* more statistically noteworthy (male reactions to contraceptive use, differential use rates in contraceptive methods among women of different ages and number of pregnancies, and incongruous declarations of fecundity status), raise serious doubts not only about the analytic framework concerning child spacing with which our project began but also about much more fundamental assumptions underlying time as the basis of fertility analysis. To be sure, age data are often unreliable in rural Africa. Still, great leaps of the imagination seem necessary to explain why women like Kaddy Sisay should be letting time, their most precious resource, slip away as they return for dose after dose of Depo-Provera.

If age has never been questioned as the basic analytic category, what about fertility itself? Mainstream anthropology, to its disadvantage, has been largely indifferent to questions concerning the number of children women have. Both demography and anthropological demography, however, have largely taken as given that that number is the key fertility question, especially the number of surviving children. What would seem to make no sense at all, then, are remarks like those of 32-year-old Oumie

Dibba. Oumie reported five pregnancies: one was a miscarriage, and she also suffered a child death, leaving her with two boys and one girl. Reporting that she was nearing the end of her childbearing years "because of many pregnancies and too much hard work," she declared that she was nonetheless "tied" to the compound—that is, she felt secure and was committed to its future welfare:

> The number of children I have borne in this compound makes me feel "tied." I have 5 children with this husband: 2 died and 3 are alive. … I'm more tied than my co-wife because she has only 2 children and I have 5. (Round 13)

The temptation of a Western observer would be to summon the surveyor who recorded this response and dispatch her back to the field to resolve the numerical inconsistencies. But taking the quote seriously raises a critical question: are *live* births the sole units of reproductive currency? If not, then, what *are* people counting?

The Rural Gambian Fertility Framework

The use of effective, long-acting contraceptives toward the end of reproductive life might suggest that many women are trying to limit the number of their children, a pattern that fertility transition watchers might seize upon. Yet there is a critical distinction to make here. "Avoiding pregnancies" is not necessarily the same thing as "limiting the number of children." Efforts to unravel the logic embedded both in the commentaries and in the numbers began to reveal the contours of an alternative perception of fertility. This alternative view converges in some areas with the child spacing and natural fertility frameworks. But in overall shape and thrust, it is radically different from both.

Reproductive Endowment

Rural Gambian logic sees the fundamental unit of fertility calculation as neither a live birth nor a surviving child but a "fetus" (*harijeo*) or "potential," of which every woman is considered to have a pre-endowed number. "*Hapo*" literally means an "amount" or a "number" of anything from mangoes to kilograms of rice. When applied to fertility, it refers specifically to what might be called an "endowment," the number of potential reproductive outcomes or fetuses that God has given a woman to bear throughout her life. The *hapo* incorporates both live births and non-surviving fetuses, and it stands independently of the number of pregnancies required to produce this total number of fetuses. A statement from a 24-year-old woman illustrates this conviction: "I would have any number [of children] that God gives me. The number of children that everyone will have since when he created us and whatever the case may be, everyone will get that number." Each fetus, whether it is born as one of a pair of twins or is miscarried, represents one constituent from this total endowment.

How many children will a particular woman have? No one knows how large her endowment is until it is exhausted. Some women have large endowments; some have very small ones. A few tragically have none at all. What everyone *does* know is that

although a woman cannot end up with any more surviving children than her God-given endowment, she can certainly end up with fewer. If she is lucky, all of her fetuses will be born as live children and will survive to maturity. More likely, some of these fetuses will be lost before being born, and some of her live-born children may die. Thus, a woman's family elders or in-laws may pray for God's blessing, asking him to bestow many children on her, a practice recorded in innumerable ethnographies of African populations. Yet they are not asking God to increase her total endowment. This would be presumptuous, even blasphemous. Instead, they are asking God to allow each of her fetuses to result in a child who survives. Because reproduction is not limited by time but by one's endowment, a woman with an endowment of nine fetuses who has had her pregnancies in close succession will finish childbearing well before a woman with the same nine fetuses but lengthier birth spacing.

Westerners would likely see the ex post facto attribution of child numbers to divine will as highly circuitous reasoning. Certainly the notion of a pre-endowed number of potential fetuses is something Western scientists would be reluctant to accept. It would be mistaken, however, to dismiss the entire framework as superstition and to abandon pursuit of the cultural logic before asking how, precisely, God's will is said to be enacted. Whereas Western culture gauges the limits of reproduction by the passage of time, the rural Gambian view of reproductive senescence holds that the number of God-given fetuses a woman will realize as miscarriages or stillbirths, as sickly infants, or as children who survive and prosper is contingent on her eroding bodily capacity to continue bearing and caring for children. Involved are concrete anatomical and physiological processes to which rural women are finely attuned, though their vocabularies and frameworks of understanding do not coincide precisely with those in the counterpart domains of Western science.[14] This section presents the local "ethno-physiological" understandings, though the Western analogues are in many cases quite apparent. Most salient in women's fertility calculations are worries about their bodily resources—muscles, strength, and blood.

Muscles. The basic physical component of reproductivity is translated loosely as "muscles" (*faso*; literally, "sinews"), a metaphor that may refer to what Westerners call "muscle mass" or "muscle tone." Muscles are said to be "cut" or "reduced" (*kuntu*) during grueling physical exertion such as farm work. In the local understanding, this refers to a "wearing out" by repeated, stressful use. The analogy of an elastic band is often used to describe how muscles, so taut and strong in a young person, grow irreversibly slack with repeated stretching and straining.[15] The most taxing event by far for women's muscle strength is pregnancy termination. One woman, who had undergone three deliveries, explains in graphic detail:

> Concerning muscle reduction, after each pregnancy it is true, because of the severe pain and the strong muscle contraction. During this contraction all muscles opened wide in order to give enough space for the baby to pass through. The space from womb to the birth canal is very tight and it needs to be widened for the baby to pass. (field notes)

Reproduction is seen less as additive within a fixed time limit, as Western analysis tends to depict the process, than as subtracting from a physical base. Both men and

women enter their early years of preadult life at about the same time: what they call their "twelve" ("12 years old"), a lively, exuberant phase of boundless youthful energy. Men are said to remain in their "twelve" as late as age 30 or so. Although a few women who have excellent health and ample domestic support may remain in their "twelve" for some time, reporting no discernible muscle loss, most say, again metaphorically, that they lose one muscle during each pregnancy termination. For a strong, healthy young woman, the toll she feels from a normal childbirth will be slight. The "older" (more worn out, tired) she becomes, the more likely she is to feel the toll. Most women's "twelve" dissipates rapidly, usually beginning its descent by age 20, because of the precipitous loss of muscle in childbirth. Difficult deliveries are especially costly to muscles; some people contend that giving birth to boys, who are said to be larger than girls, and possibly more stubborn, "cuts" two muscles. After the first child, giving birth usually becomes relatively fast and easy. At some point, though, it becomes dangerous again because of the loss of muscles over successive pregnancies.

The most extreme manifestation of muscle loss is having a "deep womb": thinly stretched by successive fertility events, it has lost the power to expel a fetus. Using the metaphor of a well in the arid Sahel, a woman described this wearing, subtractive process: "For every birth the stomach [womb] is scooped and it eventually deepens. The older the well the deeper it becomes and the more difficulty in drawing water from it" (Round 6). It is still possible to conceive with a "deep womb," but everyone recognizes this as a dangerous state; the body has lost its ability to expel a fetus. For women whose deliveries become longer and more painful, more time is required for recovery. At some point, a woman realizes clearly that she is *sarifo* ("spent"[16]). She might be able to conceive and bear another child or two, but at risks she knows have now risen sharply. God's will cannot be known until reproduction is finished, but it certainly becomes much clearer as the end approaches.

As muscles reach their end, the body becomes "worn out" (*koto tale*). Translated literally as "old" or "aged" (thus, *muso koto*: "old/worn out woman"), this implies having flaccid muscles; wrinkled, sagging flesh; and dry, flaky skin.[17] As used here, the word *koto* implies that one has come to this condition because of childbearing. For women, being "old" therefore has special meaning: childbirth is so taxing that women who have suffered more difficult pregnancy and childbearing ordeals, especially if these ordeals are closely spaced, become "old" more quickly than those who have not. They become "old" not simply in reproductive function but in physical appearance well before their male age peers.[18] Such perceptions are reflected in men's comments about their wives. In one of the male surveys, men were asked if they planned to marry another wife. Yes, said a 46-year-old man whose 38-year-old "spent" wife had had ten pregnancies: "Because she is getting old, and I am still young." Yes, also, said another man, aged 48: "Because you know a woman and a man are different in getting old easily."

Strength. Like muscles, strength (or "power"—*sembo*; most closely translated as "energy") is lost gradually over time, especially during times of physical stress such as the hunger season, just before the harvest. Like muscles, strength is lost particularly during childbirth. But unlike muscles, which can only decrease, strength can be replenished with rest and nutritious foods such as meat and chicken.[19] It never again,

however, rises to the level of one's "twelve." Dipping and surging over the life cycle in an overall downward direction, strength is life itself. When all strength fades, whether slowly or abruptly, life ends.

A woman with an ample diet and abundant help for child care and farm work will probably have easy births because she can regain her strength readily. An undernourished woman, who alone must tend to her husband as well as elder in-laws and small children (including visits to distant clinics for routine well-baby checks and emergency treatments), while she tries to keep pace with heavy farm work and earn a small cash income by walking several miles to sell vegetables, will find it increasingly difficult to withstand the strain of childbirth. In her tired, weakened state, one difficult delivery will sharply escalate the risks of another one the next time. It will also drain her strength, forcing her to use more of her reserves of muscles during labor and delivery, and she may lose two muscles rather than one during the next delivery. Thus, although muscles are the primary locus of reproductive capacity, strength is far more prominent in everyday conversations about fertility. The reason, apparently, is that the ultimate quantity of muscles is not only unknown but fixed, so it is the gain or loss of the more contingent element, energy, that determines how, or even whether, a woman will be able to use all her muscles.

Blood. Blood (*yelo*) is the third principal component of a woman's reproductive potential. Having sufficient blood is critical for maintaining strength. Yet blood is also needed to make a baby, and the process of giving birth is considered to be a major cause of blood loss for a woman, particularly when intensified by hard work and inadequate diet. Being pale and listless, a state frequently compounded by one of the world's highest malaria levels, is an ominous sign that a woman is unprepared for the next pregnancy and birth. At risk is not only her own safety but that of her baby, who may be born sickly and die. Such problems are intensified because blood, unlike strength, is replaceable only with great difficulty. (Menstruation is considered draining to women; this is expected and is considered normal, although abnormally heavy or lengthy menstrual periods provoke worry about blood loss.) The ferrous sulfate and folic acid tablets now given to pregnant women in family planning clinics are considered poor substitutes; the only sure way to replace blood is transfusions. Because the blood donated to one person is blood lost to someone else, however, even close relatives donate to each other with great reluctance—a pattern long noted throughout most of the region.

The basic constituents of reproduction—muscles, strength, and blood—operate in a close bodily synchrony, particularly during childbirth and its aftermath. Such interactions among bodily resources determine both how quickly a woman can safely spend her reproductive endowment and how many of her fetuses will survive to birth and to healthy maturity. Whereas it is impossible to tell by looking at a woman whether her "endowment" is gone, losses of strength, muscles, or blood are apparent to the astute eye. The main points here are two: (1) Fecundability is seen as only one of a number of factors that determine a woman's ability to reproduce, and often a comparatively minor one. (2) Senescence, whether that of one's reproductive capacity or of the body

overall, occurs during wearing life events. The decline of body resources may occur slowly and steadily, or in sharp, unpredictable drops interspersed by long, steady progression. The pace depends on an individual's life circumstances.

It is important to reiterate that these are local descriptions of reproductive dynamics. However, many of their links to what various Western disciplines would recognize as scientific "facts" are quite close, a circumstance that makes these cultural tenets all the more convincing, given the inevitable difficulties in translation and in interpreting the metaphorical quality of some of the vocabulary in which they are expressed.

The Medical Significance of Mishaps in the Body Resource Framework

While a woman fully expects to expend all her reproductive capital eventually, she prefers to do so through normal childbirth events. What she most fears is prolonged, injurious deliveries: in particular, those that fail to produce living children and are themselves destructive of reproductive capital. Mishaps can be both cause and consequence of traumatic pregnancy outcomes. A mishap may be caused by (among other things) overly frequent childbearing ("rampant" births), a heavy workload, a shortage of blood, or simply being very tired. If the womb is not well, the pregnancy cannot survive. A reproductive calamity may thus reflect an underlying health problem. Alternatively, it may so badly deplete a woman's body that it precipitates another mishap the next time, especially if she has had no opportunity to recover. Physically traumatic pregnancy outcomes are in any case considered *more* costly than normal births to a woman's reproductive capacity.

Giving birth to a stillborn child (*siiringo*) is often described as extremely difficult. A living baby makes small movements that render every push of the mother more effective in dislodging it, but a stillbirth can exact enormous muscle tolls during attempts to expel a large, inert fetus; and many women, particularly those who undergo stillbirths after many pregnancies, describe acute, prolonged suffering.[20] A miscarriage (*wulu* ["delivery"] *kurong* ["extremely taxing"]) is quite different. Using an analogy of the locally ubiquitous mangoes, a village traditional birth attendant vividly captured the miscarriage experience. When a ripe mango is picked, the fruit snaps off the dried stem easily, its life moistures sealed intact on both sides of the break: the tree and the fruit. Trying to pick an unripe mango is quite a different experience. The fruit can be pulled off the green stem only with determined force. Once it is finally torn off, both the mango and the tree undergo a dramatic, sustained loss of fluid. The same is said to occur with a miscarriage: since the fetus is not yet a discrete entity, it is essentially a piece of the woman—her own flesh—that is being torn out, causing great pain, heavy blood loss, and possibly internal damage. A woman can even bleed to death. Induced abortion is abhorred for precisely these reasons. It can do great damage, to the extent that the woman may even destroy her future fertility potential, if not her life. Although some miscarriages are experienced simply as late menstrual periods (and although some women even attempt to induce "late" periods—Levin, forthcoming), those attempts that occur further into the pregnancy, but before the fetus becomes distinct from the mother, are considered especially hazardous. The knowledge that schoolgirls sometimes induce abortions in order to avoid expulsion may in some

cases underlie families' decisions to withdraw from school a girl whose academic attentions seem to be straying. Both stillbirths and late miscarriages entail labor pains, and a late miscarriage, like a stillbirth, "cuts" at least one muscle, sometimes more. Yet so feared is the bloody loss of flesh that a miscarriage and its aftermath can be considerably worse. By contrast to a stillbirth, in which all the tissues and fluids are expelled, the effects of a miscarriage may leave residual infections, and the damage may heal slowly.

In sum, while Western fertility analysis effectively treats miscarriages and stillbirths as events that take up time in a birth interval, Gambian women see outcomes other than live birth as causing *more* harm than live births and even as reducing their overall fertility potential. Although God may have endowed a woman with eight pregnancies, the experience of two miscarriages may leave her so drained that she is able to produce only four of the eight as live births. Moreover, a series of difficult births can exact a disproportionate bodily toll: they can make her look, feel, and behave as if she were much older than her actual age would suggest.

Body Resource Expenditure

Although a woman's greatest resource at the outset of her adult life is her body's capacity to reproduce, everyone recognizes that she will eventually grow old and lose her reproductive potential. The question is *how* she will do so and with what results. While biology lays the groundwork for how the mechanisms of aging and reproduction play themselves out, the social and economic environment determines the success with which an endowed reproductive potential can be realized.

Among the domains that this view of fertility most vividly illuminates is that of women's relations to men and in-laws. Reproductive "struggle" cannot be considered independently of its intended beneficiaries. A woman is seen as expending (as expressed in Fula, "to dry" or become thin) this resource on behalf of those who are supporting her: her husband and his family. As a young bride, she is admonished that she must "struggle" in the husband's compound. To the degree that she works hard and manages to have children, especially sons, she will succeed in establishing "roots," a Fula expression, which anchor her firmly to the compound and its future. Posing an abstract question such as "How many children do you want?" makes no sense to her without reference to a specific man. Such a query is understood as an implicit question about the state of her marriage.

Physically, a woman will be "spent"—weak, thin, and haggard—when she finishes childbearing. Her muscles will be gone, and she may well be anemic from the cumulative stresses of childbearing and illnesses, especially malaria. Now is the time her children and husband should rally and nourish her. Whereas her muscles cannot be replaced, her body fat will be restored and her skin will regain a glow. She can begin to sit back and enjoy the fruits of her labor, living in the gratitude of her husband and children. She may be sent by her sons to Mecca, returning to start a market business with capital they provide her, and moving into a managerial, consultative role in the compound. Any ailments she has will be treated immediately; her grown children will

hire a taxi to take her to the clinic or even to Banjul, and they will purchase any necessary medicines. This implies that much of old age can be a time of leisure, rest, and freedom. Certainly it can be a time of far better health than she suffered during the harsh struggles of her childbearing years.

The sub-fertile age peers of the mother of many children may look and feel younger than she does; they may even live longer. She, however, has exchanged her youth for children—by far the preferred option. No one would prefer the fate of a long life of barrenness to a possibly shorter, but far happier life of a woman whose "heart is at rest." (Of particular note in this idiom is the cultural equation of "rest" with "happiness.") Old age, even more clearly than the ethnographers of Africa have realized, is considered a *bodily* achievement, especially for women. Becoming "old" in the service of the husband's family by such a visible "struggle" and "sacrifice" is one of life's most honored achievements.

The body expenditure ideology, however, confronts a woman with a paradoxical dilemma. She needs children, but should her marriage go sour or her husband prove "useless," her body will have been spent on a dead–end relationship and her income on its progeny. An educated woman with wide contacts in the international development field expressed the predicament as "*maternal depreciation*." Although she may have been alluding to "maternal depletion," her own phrase captured far better the combined economic and medical plight of a woman who must watch each longed-for pregnancy result in a mishap or a child her husband does not support. In such a situation, each pregnancy devalues her cumulatively and makes divorce increasingly unfeasible. Eventually, to make ends meet, she may try to suspend childbearing until she finds a better man. Her own family members, since they will likely bear the brunt of the support for her children, are likely complicit. Scolding her for "delivering for nothing," they may demand that she stop having children. They do *not* mean, however, that she should stop altogether but that she should reserve her remaining endowment for someone else.

What about (to adapt an old demographic concept) the "value" of mishaps? Women's ways of demonstrating wifely virtue are not limited to childbearing or to rearing a child successfully, although these are by far the most desirable outcomes. Simply getting pregnant periodically, even if some of these pregnancies eventually go wrong, is a key sign that a marriage is on track. The most tragic case of all is a woman who has never had a pregnancy, not even a miscarriage, her youth suspended in an eerie agelessness. Fearing such stigmas, barren women sometimes go to the clinic seeking medical verification that they have had a miscarriage so they can report to their husband that they have at least been pregnant. (For descriptions of treatment of infertility and miscarriages in The Gambia, see Skramstad 1997 and Sundby 1997.)

Preventing Reproductive Mishaps and Mitigating Their Effects

Although the odds seem set against them, Gambian women are far from helpless in the face of forces that deplete their bodies and depreciate their value as wives. Large numbers of living children are highly desirable. Yet women's efforts to realize their

physical capacities reflect wide scope for individual action. A woman gains cognitive skills that enable her to mitigate body expenditure. She learns to read body signs: her own and those of her co-wives and daughters-in-law. As she advances in number of pregnancies, she tries to eat energy-rich foods and to reduce heavy work to preserve her muscles for their remaining reproductive ordeals. Above all, she tries to monitor her bodily decline and to avoid pregnancy when her body is unprepared.

In such contexts, the patterns of contraceptive use following reproductive mishaps, so counterintuitive to Western beliefs about the dynamics of high fertility, make good sense. Since the principal roadblock to having as many children as God gives is not time but a deficit of body resources, the best strategy in cases of traumatic reproductive mishaps is not to rush ahead and waste a precious pregnancy out of one's remaining endowment; rather, it is to slow down and wait for the body to heal the damage that pregnancy and childbirth can inflict. So damaging are such mishaps, especially to reproductively "old" women, that these women may actually welcome the long-term effects of Depo-Provera, something that most younger women just beginning their childbearing careers avoid at all costs. A "spent" woman may try to wait as many as three or four years before seeking another pregnancy.

While women suffering a recent miscarriage or stillbirth are likely to use contraceptives until their bodies heal, contraceptive users with many pregnancies whose last-born child is still alive, yet who have had one or more miscarriages or stillbirths in the past, would seem to have less cause to delay a new pregnancy; for this reason, their cases are perhaps the best evidence of the validity of our alternative analytic framework. For such a woman, this experience can reflect a trauma of such magnitude that it may affect how she manages her subsequent reproductive life. Thirty-seven-year-old Fanta Juwara had carried seven pregnancies, of which five seemed to have survived, including the last. Despite all these pregnancies, the one stillbirth remained vividly inscribed in her memory as she recalled her ordeal and its debilitating effects:

> The stillbirth I had was more painful than all my births because I did not deliver that one with life. He was dead inside me so I had to use all my power to push him out. If he had been alive he would be moving himself as I pushed but that was not the case. Because of that trouble over strength, my husband wanted me to rest for two years before I got pregnant again. I did not take any medicine to avoid pregnancy [because the husband was away most of the time] but I was washing [treating] my stomach with local and *toubab* [modern/Western] medicine because my stomach was not well then. When I felt my stomach was well enough to have another child I got pregnant and my husband left again. (field notes)

Yet without doubt, the starkest case among all the women from whom we have commentary is that of Kaddy Sisay, whose case began this article. With no surviving children after several pregnancies, Kaddy had begun Depo-Provera injections as soon as her last remaining child died, apparently just after she was interviewed in Round 5. She next appears in Rounds 7 and 10 with comments like these:

> My stomach is in pain when blood is coming out. I would like to have a rest because I always have difficulties when breastfeeding. I want to have a rest. [I am using] injection to delay pregnancy because I always have problems while pregnant. (Round 7)

I used to suffer a lot before I delivered. I used to have 5 days in labor or more. I want to rest and also to regain my strength. I am afraid of labor. Since I started childbearing I always have difficulties before delivery. I am forgetful; therefore the pills which require everyday attention are not suitable for me. I take the injection once every three months, which is very convenient for me. (Round 10)

Kaddy's difficult fertility history is undoubtedly responsible for her conjugal troubles in her second marriage. Thus, although Kaddy wants more children (in Round 12 she expressed a desire for four more), it is not clear that she wants them with her present husband: "I am suffering in my marriage. I think I do not want a child here anymore. I do not talk to him [her husband] about it" (Round 14). Kaddy's most telling response, however, was her answer to a query about which of Islam's tenets are important for women and how she tries to observe them:

A woman is ordained by Allah to follow the orders, advice, and wishes of her husband. A good Muslim woman should not refuse to have contact with her husband when requested, and should also bear children for him. As said by the Holy Prophet, the best among his people is the one that increases the number of his people, because in the day of judgment he doesn't want the people of other prophets to be more numerous than his own. I encounter a great difficulty in following these rules. I was following them all along, but since I started bearing children, I suffered a lot during my pregnancies and much more in labor, because in each delivery, my people thought that I would die, yet none of these children are alive. Now I am using family planning to prevent pregnancy in order to regain my strength, power, and health. Though my husband does not like it, I am using it for prevention. (Round 11)

Rethinking Fertility, Time, and Aging

How do these new understandings about reproduction and senescence help to clarify some of the puzzles with which this article began? To start, why are so many women reluctant to give a numerical answer to the question of how many children they want? The answer becomes clearer if we recognize that, in our rural Gambian setting, the overriding fertility question throughout a woman's reproductive life is not how many children she wants but rather how much of her God-given endowment she will be able to realize as living children. Thus, the question is probably being interpreted as a query about the "amount" or "number" of potential children with which a woman has been endowed. Although she may insist that she wants as many children as God gives her or may simply refuse to give a number, responses connoting superstition or fatalism, further probing reveals that it is primarily younger women who give this answer.[21] Because a woman cannot know before she is "spent" what her potential is, it hardly makes sense to ask her how many children she wants. To a young woman, this is an entirely open question, the answer to which she can only glimpse as her marriage and fertility trajectories take more visible shape.

As to the notion of time and its relationship to fecundity and aging, worries about menopause or the effects of time rarely appear in women's narratives of their fertility histories. While these facts seem to defy common sense in a society so desirous of

children, the logic that now emerges reveals that fecundity—and even "aging" itself—are seen as having little to do with what Western society refers to as "age." Western assumptions posit that the countdown to menopause is a time-dependent event and that this countdown poses a growing threat to a sub-fertile woman as time elapses. By contrast, rural Gambians see reproduction, particularly the stresses of labor, as eroding body resources. In fact, whereas menopause certainly terminates the possibility of reproduction, reproduction, in aging the body, may precipitate menopause. Because a woman who has lost all her bodily reproductive resources is deemed to be "old," it is not surprising that many women who by Western standards might be judged young in years claimed to be "too old" to bear children, often drawing attention to their aged appearance. In terms of the endowment/body expenditure view of fertility, a woman who survives to age 70 could have been "old" for over half of her life.[22]

Clearly the case of a rural Sahelian country is an extreme one. Here, where fertility reaches one of its highest peaks in the contemporary world, women must reproduce under conditions of sparse obstetric care, recurrent malaria, and intense work and nutritional stress. Yet it is precisely such factors that make this a critical case for challenging Western science's confidence in the time-bound nature of reproductive capacity. Under these conditions, a woman's bodily potential is very likely to be expended quickly, a fact that renders both the duration of birth intervals (assuming they are not excessive) and the timing of menopause largely irrelevant to ultimate child numbers. Since the anatomical and physiological limits of the body will undoubtedly be reached before any temporal boundary, time can even be an ally: moderate attempts to stretch birth intervals can aid attempts to achieve a large family size.

As for the often-perplexing male perspective on reproduction, the issue has usually been cast in dichotomous terms: men either support or do not support contraceptive use. Seeing reproductivity as a potential to be realized rather than a time-bound capacity helps to explain why men—and their elder female kin—sometimes object strongly to the use of contraceptives, and why women's health can be such an inexplicably volatile domestic issue. If a young contracepting woman were locked into a time-bound framework, she would be depriving herself of children as well as her husband. But since the limit is not one of time, she has much to gain if she withholds pregnancies from him in order to reserve them for someone else, possibly by feigning tiredness or exaggerating the severity of an illness. Once the question is posed as one of contraceptive use not to "limit" children but to "space" them and to spare worn out wives, men voice almost uniform support for contraception.

The chief value of the body expenditure thesis is that it explains many behaviors that previously eluded explanations except fatalism or lack of education. If the two cultural logics, Gambian and Western, are placed side by side, the grounds of disagreement become clear. Westerners would see the notion of God's will and of reproductive outcomes whose numbers cannot be known in advance as manifestations of superstition in societies labeled as traditional. Gambian women, however, if someone were to explain to them the parallel Western beliefs about reproduction, would probably find the reduction of fertility to a time frame as begging the question. That is, since the validity of the notion of time is taken as given in the question about fecundity, women's answers cannot be phrased in meaningful ways. People are not confused by

the concept of age or of chronological time or with the notion that body processes transpire at a certain average temporal pace. Under the conditions Gambian women experience, attempting to force the notion of a highly contingent reproductive capacity into a fixed temporal frame would make no sense.

Placing Western and African beliefs about fertility side by side exposes the biological facts that Western society has taken for granted to the same tests and skepticism to which African theories have long been subjected. It is not at all clear that the Western view would prevail.

NOTES

1. The interview rounds indicate seven months of Depo-Provera coverage, but data entry for the last two months was incomplete.

2. Demography is the focus of this article because it is the discipline in which contemporary Western assumptions about age and reproduction have shaped some of the most sophisticated analytical tools for the measurement of fertility; see, however, a parallel analysis of sociocultural anthropology, in Bledsoe with Banja (1997).

3. On this subject, see Caldwell, Orubuloye, and Caldwell (1992); Mason (1997); Cohen (forthcoming); Lockwood (1996).

4. The question of how people count children and reckon fertility lies outside the scope of this article. For an attempt to use the Gambian findings to revisit the question in the context of contemporary cultural views of reproduction and contraception in the United States, see Bledsoe (1996).

5. In the cases and quotes, names have been changed to preserve anonymity, and surveyors' English transcriptions are lightly edited for better comprehension. Unless otherwise stated, all local terms are in Mandinka, the language of the largest ethnic group in the area.

6. This question has inspired seminal demographic work in other pre-fertility transition contexts (e.g., Bongaarts and Potter 1983; Coale 1986). Related questions have been addressed in other fields such as anthropology, microeconomics, obstetrics, and reproductive biology. In the case of evolutionary biology, see Blurton-Jones (1986); Pennington and Harpending (1988); Kaplan (1994); and Calder (1984). This article recognizes the intrinsic importance of empirical findings stemming from studies in evolutionary biology, although it stops short of drawing any conclusions for natural selection or reproductive fitness. It also posits active, conscious efforts to influence biological outcomes in ways that have lain outside the thrust of work in this field. (See, however, Irons 1983: 204–205.)

7. For facility, this article uses the term "menopause" to refer both to the end of the menses and to the premenopausal decline in fecundability, which may predate menopause by several years. Wood (1994: 414) underscores the paucity of research on the causes of the timing of menopause.

8. The Gambian census of 1993 reported a decline in total fertility of some 6 percent (Sonko 1995; Republic of The Gambia 1997).

9. The analysis drawing on the multi-round survey data represents numbers of events, not individuals. Thus, several individuals appear only once, while a number of women are represented as many as 13 times.

10. Cases of sterilization were largely lost from view. Because the study was designed largely to examine birth intervals among still-fecund women, the rounds, on which much of the second part of the study was based, focused only on women who had had a live birth in the last

three years. Since this strategy selected heavily for unsterilized women, we have no commentary from sterilized women describing why they took this measure.

11. As for the three cases of sterilization observed, two instances occurred after a miscarriage or stillbirth and the third after a live birth. While there is no way to tell why these measures were taken—whether voluntarily to limit the number of children or as a result of life-saving measures during an obstetric emergency—the proportion of women using Western contraceptives after a miscarriage or stillbirth is 10 percent, still higher than use following any other outcome.

12. There is some possibility that the miscarriages or stillbirths these young women reported were actually induced abortions, in which case their subsequent contraceptive use might imply that they were simply trying, as many urban teenagers do, to delay childbearing. Both of these women were married, a fact that diminishes the abortion possibility but does not eliminate it.

13. In theory, a contracepting woman whose pregnancy ended with a miscarriage or stillbirth could have been attempting to space a previous live birth: by inducing an abortion in order to continue breastfeeding her previous child. However, no women in the 1992 survey whose previous pregnancy resulted in a still breastfeeding living child was contracepting after a reported miscarriage or stillbirth.

14. We are grateful to Medical Research Council physician Elizabeth Poskitt in The Gambia and to nurse-midwife Patricia Woollcott (Evanston, Illinois) for Western scientific perspectives on some of the materials in this section.

15. There is considerable Western scientific support for these notions. In the womb of a young woman, the fetus is observed to lie upright, well-supported by taut muscles. With a multipara, the uterine muscles have slackened and the fetus tilts forward, increasing the risk of a breech presentation or the initial emergence of a limb. Uterine muscles and ligaments are tight at the outset of reproductive life, but they become increasingly slack as they are torn or stretched irreversibly over multiple births. This is true particularly of the abdominal wall, the rectal sphincter, and the anterior vaginal wall.

16. We are grateful to Carla Makhlouf Obermeyer for noticing this word's likely Arabic origin (*sarf*) and to John Hunwick for pointing out its likely subsequent West African transformation through vowel additions.

17. Parfait Eloundou-Enyegue (personal communication) reports a similar linguistic phenomenon in Cameroon; the verb *teg* in Ewondo is used to mean to "age," "wear out," or "soften."

18. Patricia Woollcott lends support to this observation, based particularly on her experience with high-parity Orthodox Jewish women in Illinois.

19. "Lack of strength" might be interpreted as maternal depletion syndrome, in which a woman who has finished breast-feeding is unable to replenish her nutritional reserves to prepregnancy levels, particularly when births occur in rapid succession or seasonal hardships are imposed by work, hunger, or disease. (See, for example, Miller, Rodríguez, and Pebley 1994; Miller and Huss-Ashmore 1989; Winkvist, Rasmussen, and Habicht 1992.) The Gambian notion of reproductivity, however, subsumes this realization as one of several key components that determine both the course of reproduction and its end. Ben Campbell (personal communication) believes that the concept of maternal depletion, though it is usually applied to the loss of energy reserves from fat and body weight during each birth interval, can also apply to the cumulative net energy/body expenditure over the lifetime. As for muscle loss, this may also decline over the adult lifespan, but perhaps to an extreme degree in West Africa where protein intake is often inadequate and fertility is high.

20. Patricia Woollcott finds this description at odds with her experience in the United States, where a stillbirth usually causes no more difficulty than a normal birth. She speculates that a stillbirth may produce a hard labor in cases where the fetus may have been dead for

some time and the head, which may have begun to decompose, has become pliant, making it difficult to deliver the shoulders. A letter written in the early part of the twentieth century to the Women's Co-operative Guild (1916: 85) in England by a woman describing a stillbirth lends support to both sides: "the birth … was harder than usual, as a live baby helps in its own way. The baby had gradually died after the flooding [probably hemorrhage], and had been dead more than a week at birth."

21. Round 12, containing a special add–on survey to address the body expenditure thesis, showed that women who, by self-assessment, were not yet "spent" were willing to leave the matter of additional children up to God in 40 percent of cases, while only 8 percent stated they wanted no more children. "Spent" women, however, yielded to God or gave no number in only 22 percent of cases. Nearly half (48 percent) said they wanted no more children.

22. See Munn (1992) and Gell (1992) for thought-provoking cultural analyses of time.

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Gender, Population, Environment

Sally Ethelston

Miriam lives with her family in Manshiet Nasir, originally a squatter settlement at the foot of Cairo's Muqattam hills, now largely a brick-built community of small apartment buildings and box-like single family homes. Most now have piped-in water and electricity. Her family is one of the thousands of *zabbaleen* (garbage collector) families comprising a large Christian minority among Manshiet Nasir's mostly Muslim residents. They live in a two-story, warehouse-like structure perhaps 25 feet high and about 20 feet square. Off to the side of the main living space, a narrow room has just enough space for a loom; a walled-in area behind the house is home to the family's 18 pigs.

Miriam is 17, and not yet married. What distinguishes her from many of her neighbors is the loom in her home, and the fact that she is literate in Arabic and beginning to learn English. Walking through the neighborhood, Miriam is an enthusiastic guide to her community—pointing out a recycling workshop housing a machine for crushing plastic for re-use, the veterinary clinic established by the *zabbaleen* association, and a daycare center for young children.

Through a convergence of local community activism and international assistance, the *zabbaleen* and other residents of Manshiet Nasir have witnessed some important changes in their lives. Improved pumping systems ensure that a majority of residents have access to potable water; immunization campaigns have all but eliminated tetanus and other vaccine-preventable diseases among women and children. Tacit government recognition of the settlement means that residents can, in effect, buy and sell property. Voluntary organizations such as the Association for the Protection of the Environment (Gama'at himayat al-bi'at min al-talawuth) sponsor projects for women that combine teaching functional literacy with ways of earning money—thus the loom in Miriam's home.[1]

Despite these improvements, Manshiet Nasir is still an urban environmental nightmare. *Zabbaleen* women sort through the garbage collected by their husbands and children with bare hands, fearing that gloves will slow down their work and add to their onerously long day. And the refuse of modern-day Cairo—replete with deteriorating batteries, broken glass and hospital waste, mixed in with the food waste that

goes to feed the pigs—poses a great threat to public health. Among the tasks assigned to children is the disassembling of used plastic syringes from Cairo's many hospitals.

Any garbage that cannot be reused in some way ends up back in the Manshia's narrow pathways until it is taken to be burned. It covers the asphalt and mud streets with a thick, soft and often slippery layer of trash. Inadequate sewage systems overflow frequently, further endangering the health of residents.

Manshiet Nasir can be viewed as one extreme of urban environmental hazard in the Middle East and North Africa. The Manshia reflects social, economic and demographic trends and circumstances common to most countries in the region: rapid population growth and increasing urbanization; scarcity of land, water and other economic resources; and limits on women's social and economic autonomy.

Many governments in the region view one or even all of these factors as obstacles to economic and social development, but often their policy responses have been ambivalent. Programs aimed at slowing rates of population growth have tended to focus solely on female reproductive behavior through the provision of modern contraceptives, paying far less attention either to men's roles in reproductive decisions or to women's other health needs. In addition, governments often fail to take into account other factors that influence women's reproductive choices, such as their education, job opportunities and overall status.

Equally important is the failure of some governments to persuade their citizens that slowing population growth has benefits for them as individuals. Few have effectively communicated the extent of natural resource limitations in the region. And citizens' general alienation from their political systems reinforces their suspicions that efforts to slow population growth are merely another way in which governments seek to protect the lifestyles of wealthy elites by reducing pressures to achieve greater social and economic equity. "Why is it easier to insert Norplant in a woman's arm than to tell a man in Mohandissin not to drive his Mercedes?" asks Aida Seif al-Dowla, a founding member of Al-Mar'a al-Jadida (New Woman), a research and study center.[2]

In some countries, such a politically provocative question is hardly ever raised. For the oil-rich states of the region, high rates of population growth (above 3 percent in most cases) have been viewed as satisfactory by governments eager to meet the demand for labor but ambivalent or even opposed to increased women's work outside the home. This view persists despite very real natural resource constraints. In Saudi Arabia, Bahrain, Qatar and the United Arab Emirates, per capita annual availability of *renewable* fresh water is less than one-third of the 1,000 cubic meters regarded as a benchmark of water scarcity.[3]

Beyond the limited availability of cultivable land and fresh water, the degradation of existing resources is a problem throughout the region. Concentrations of air pollutants such as sulfur dioxide (in Istanbul) and lead (in Cairo) are well above the levels considered safe.[4] Water pollution is also a serious problem due to industrial wastes, agricultural pesticides and other chemicals. The quality—and thus the productivity—of agricultural land is threatened by salination, which is a consequence of the expansion of irrigated agriculture in countries like Egypt and Iraq.

Awareness of these environmental problems is growing in the region, according to Mustafa Tolba, the former head of the UN Environment Program and now the

Population Trends

Countries	Population Mid-1994	Natural Increase (annual %)	% Age < 15 yrs.	% Married Women Using Contraceptives	
				Total	Modern
Algeria	27.9	2.5	44	36	31
Bahrain	6	2.4	32	54	30
Djibouti	6	3.0	41	—	—
Egypt	58.9	2.3	40	47	45
Gaza	7	5.0	60	—	—
Iran	61.2	3.6	47	—	22
Iraq	19.9	3.7	48	18	10
Israel	5.4	1.5	31	—	—
Jordan	4.2	3.3	41	40	27
Kuwait	1.3	3.3	43	35	32
Lebanon	3.6	2.0	33	—	—
Libya	5.1	3.4	47	—	—
Morocco	28.6	2.3	40	42	36
Oman	1.9	4.9	36	9	8
Qatar	5	1.0	23	26	24
Saudi Arabia	18.0	3.2	43	—	—
Somalia	9.8	3.2	47	—	—
Sudan	28.2	3.1	46	9	6
Syria	14.0	3.7	48	—	—
Tunisia	8.7	1.9	37	50	40
Turkey	61.8	2.2	35	63	35
United Arab Emirates	1.7	1.9	32	—	—
West Bank	1.4	4.0	50	—	—
Western Sahara	2	2.8	—	—	—
Yemen	12.9	3.4	51	10	6
Comparative Countries					
Mexico	91.8	2.2	38	53	45
Pakistan	126.4	2.8	44	12	9
United States	260.8	0.7	22	74	69
Zimbabwe	11.2	3.0	48	43	36

SOURCE: *1994 World Population Data Sheet,* Population Reference Bureau, Inc., Washington DC.

president of a non-profit environmental consulting firm. "Developing countries no longer see concern for the environment as a luxury," says Tolba.[5] And environmental "problems" are being defined more broadly to encompass such concerns as health, bad housing and poor sanitation.

Yet teaching alternate, more environmentally sound behavior is extremely difficult, according to Emad Adly, Secretary-General of the Arab Office for Youth and the Environment. "You can't ask people to dispose of garbage properly if there's nowhere to put it; you can't really talk about water conservation without the technology to make it happen; and you can't buy healthy food if it is not on the market. The fact is that there are few alternatives to the way most people currently live their lives."[6]

At the international level, as awareness of the challenges posed by population growth and environmental degradation has increased, so has concern for how linking the two might affect women. Particularly troubling is "the implication that women are responsible for environmental degradation as long as high fertility rates are viewed as a significant cause of environmental pollution." Such a perspective reduces choices of family planning "to a means to an end rather than a legitimate end in itself."[7]

These concerns provoked sharp debate at the forum of non-governmental organizations (NGOs) held concurrently with the 1992 UN Conference on Environment

and Development in Rio de Janeiro. By the time of the summit, population had been downgraded from primary importance to a number of "cross-cutting" issues; and the Vatican, with the help of a few countries, succeeded in weakening Agenda 21's language on family planning such that the word "contraceptive" never even appeared. At the NGO forum, those gathering in the Planeta Femea (women's tent) went back to the beginning to ask: Is there a causal relationship between population increase and environmental deterioration? Given the emphasis of many developing countries' family planning programs on numerical demographic goals, rather than on the right of individual women and men to plan their families, would a framework linking population and the environment further strengthen the emphasis on top-down, coercive population *control*? For the majority of those attending the discussions, the answer was yes.

Two years after Rio, the International Conference on Population and Development (ICPD) is taking place in Cairo. Focusing on population and sustainable development, the ICPD reflects many of the concerns raised by women in Rio, and includes a much greater emphasis on women's needs and aspirations. The ICPD's draft Programme of Action's more holistic approach acknowledges that population, reproductive rights and health, gender equality, the environment, and development are inseparable.

Moving beyond "family planning" is a recurrent theme of the articles in this issue of *Middle East Report* [September–October 1994] Philippe Fargues posits changes in population structure and inter-generational and gender hierarchies as sources of social change. Challenging the accepted wisdom regarding the Arab world's demographic explosion, Fargues argues that the demographic transition to lower fertility in the region is, for the most part, well under way. The crisis is social and political, not demographic.

Homa Hoodfar notes the success of Iran's government in communicating the relevance of the population issue for that society, the international community, and individuals. At the same time, she emphasizes the contradiction between the government's programmatic emphasis on female contraceptive methods and its reluctance to grant greater freedom and decision-making authority to women.

Nonprogrammatic factors affecting reproductive attitudes and behavior are also the focus of Youssef Courbage's essay. He calls attention to how varying patterns of international migration have led to the "diffusion" of contrasting norms of ideal family size, which is also being affected by labor force participation of women.

Back in Manshiet Nasir, Miriam is part of the changes in the hierarchy Fargues describes. By learning to read and write, she has already gone far beyond her parents. With an independent source of income, her role in such decisions as who she will marry and how many children she will bear will be much stronger than her mother's. And her travels outside Manshia—made possible by the association in which she is emerging as a leader—are expanding her perception of the possible.

Yet the interventions that have helped bring some change to Miriam's life do not come cheap. While the preparatory process for Cairo has helped resolve some of the political tensions evident in Rio, the issue of resources remains problematic: will those with greatest control over the world's wealth be willing to make available even the

limited funds explicitly called for in the draft Programme of Action—$17 billion by the year 2000, one-third of which is slated to come from donors? Reflecting on progress since the Earth Summit—and other international conferences going back almost 20 years—Mustafa Tolba, for one, has his doubts.

"The Rio conference called for a total of $725 billion, $600 billion of which is to come from developing countries and $125 billion in aid," he recalls. "What is available now? The Global Environmental Facility has gone from just $1.3 billion to $2.0 billion in three years—an extra few hundred million. And the same will happen in Cairo. Money, where will it come from and where will it go? The fact is we, as an international community, are not serious. If all the resolutions, declarations, and action plans promulgated and adopted had actually been translated into deeds, we would not have environmental problems. Instead, we have an environmental crisis."

Effective change also carries a political price tag. While NGOs are expected to play a key role in pushing forward the agenda that emerges from Cairo—as they have in Manshiet Nasir—they cannot substitute for government action. "Everyone is putting great hope in the role of NGOs, but it's too much," says Aida Seif al-Dowla. "They are not an alternative to a corrupt government that consistently seems to prove that it doesn't really care about the well-being of its people." Following the Cairo Conference, with all its extravagance and whatever the merit of its proclamations, the task of pushing the process of change in the face of existing hierarchies of wealth and power will remain.

N O T E S

1. For a more complete account of both the history and the health profile of Manshiet Nasir, see Belgin Tekçe, Linda Oldham, Frederic C. Shorter, *A Place to Live: Families and Child Health in a Cairo Neighborhood* (Cairo: American University in Cairo Press, 1994). See also Marie Assaad and Nadra Garas, "Experiments in Community Development in a Zabbaleen Settlement" *Cairo Papers in Social Science*, Vol. 16 Monograph 4, Winter 1993–94 (Cairo: American University in Cairo Press, 1994).

2. Interview, June 1994.

3. For more on Saudi Arabia's water resources and the concepts of water stress and water scarcity, see Robert Engelman and Pamela LeRoy. *Sustaining Water: Population and the Future of Renewable Water Supplies* (Washington, DC: Population Action International, 1993).

4. WHO/UNDP. *1992 Urban Air Pollution in Megacities of the World* (Oxford: Blackwell, 1992).

5. Interview, June 1994.

6. Interview, April 1994.

7. Susan Cohen, "The Road from Rio to Cairo: Toward a Common Agenda," *International Family Planning Perspectives*, Vol. 19, No. 2, June 1993, p. 61.

The Environment as Geopolitical Threat
Reading Robert Kaplan's "Coming Anarchy"

Simon Dalby

Population, when unchecked, increases in a geometrical ratio. Subsistence increases only in arithmetical ratio. A slight acquaintance with numbers will show the immensity of the first power in comparison of the second.

By that law of our nature which makes food necessary to the life of man, the effects of these two unequal powers must be kept equal.

This implies a strong and constantly operating check on population from the difficulty of subsistence. This difficulty must fall somewhere and must necessarily be severely felt by a large portion of mankind. (Thomas Malthus)[1]

Every explosion of social forces, instead of being dissipated in a surrounding circuit of unknown space and barbaric chaos, will be sharply re-echoed from the far side of the globe, and weak elements in the political and economic organism of the world will be shattered in consequence. (Halford J. Mackinder)[2]

It is time to understand 'the environment' for what it is: *the* national-security issue of the early twenty-first century. The political and strategic impact of surging populations, spreading disease, deforestation and soil erosion, water depletion, air pollution, and possibly, rising sea levels in critical overcrowded regions like the Nile Delta and Bangladesh—developments that will prompt mass migrations and, in turn, incite group conflicts—will be the core foreign-policy challenge from which most others will ultimately emanate, arousing the public and uniting assorted interests left over from the Cold War. (Robert D. Kaplan)[3]

Once Again, the Malthusian Spectre

Robert Kaplan's cover story in February 1994's *Atlantic Monthly* magazine painted a particularly depressing picture of the future. In 'The Coming Anarchy' he argues that much of the world is on a path to violence-ridden 'anarchy', where states collapse and private armies and organized crime establish themselves as effective local administrations. In Mackinder's terms, he clearly suggests that the explosion of demographic and environmental forces has already shattered the weak parts of the political and economic organism. The natural environment is the key villain in the piece. Its degradation has, he argues forcefully, set off a downward spiral of crime and social disintegration in many places. This slide into chaos is spreading. What is now the case in West Africa will soon spread further as environmental problems generate further migration to urban areas in the underdeveloped world, resulting in more social disintegration and ethnic conflict. These issues will become the national-security issue for the United States in the next century. The natural environment is thus specified as the threat of the future.

While Kaplan's article generated an angry response from readers who contested his specific accounts of various countries in the letters pages of subsequent issues of the magazine, the themes he wrote about clearly resonated with contemporary American angst about crime, environmental deterioration, and the lack of clear direction to post–Cold War security and foreign policy planning. His very rhetorically powerful analysis is a high-profile public articulation of contemporary neo-Malthusian themes in post-Cold War geopolitical discourse.[4] It parallels much of the rest of the US media coverage of Africa, and Rwanda in particular, in its representations of Africa as a place of 'tribal', 'hostile', 'violent' Others.[5] It is notable for its pessimism, forceful prose, and the absence of any suggested substantive political remedies for the immanent dystopia.

But Kaplan is not alone. Readers of contemporary international-relations literature, foreign-policy journals, and magazines of popular political discussion, in particular in the United States, have noted that there has been a revival of interest in the themes that concerned Britain's first professional academic economist.[6] Thomas Malthus, the country parson who is widely memorialized for his pessimism about humanity's lot, a fate due largely to our supposed predilection for breeding faster than we can improve our capabilities to feed ourselves, is again in vogue in post–Cold-War policy discussions. But his theories are often now linked to themes of environmental degradation and to some of the traditional themes of geopolitics in popular policy and political discussion.

Against the backdrop of the major United Nations conferences on environment and development in Rio de Janeiro in June 1992, and on population issues in Cairo in September 1994, none of this renewed concern with population as a political factor is perhaps very surprising. But when this theme is linked, as it explicitly is by Kaplan, to the more general concerns about environment as a 'security' threat, these arguments become important in the political processes of foreign and security policy formulation in states in the 'North'. Foreign and security policy prescriptions depend in part on how the questions of appropriate policies are practically understood within the larger geopolitical discourses and their interpretations of contemporary geopolitical

order.[7] The same is true of environmental themes in international political discussions and policy formulation.[8] The recent academic discussions of the links between environment and security have been suggesting that these matters are complex and unclear, and that simple assumptions about the interconnections between environmental factors, population, and conflict need careful evaluation that is sensitive to specific geographical contexts.[9]

The more popular media discourses in play in discussions of the future of environmental factors in security policy are not nearly so sophisticated, but they are likely to get political attention when published as a cover story in a prestigious upmarket magazine like the *Atlantic*.[10] Kaplan was taken seriously in the White House, given his track record as a travel writer and war correspondent with a knack of getting into conflict areas. His 'Anarchy' article was specifically cited by President Clinton in a speech soon after its appearance, and 'became a practically *de rigueur* citation among Cabinet members appearing before Congress.'[11] While Kaplan's article did not initiate the policy process considering the links between security and environment, it undoubtedly raised their profile considerably.[12]

Malthus and Mackinder

In many ways none of this is very new. In England, in the years following Malthus' initial publication during the transformations of the Industrial Revolution, and in the aftermath of the American and French revolutions, there were widespread concerns among the political elites and in the emergent middle classes about political order, linked to the fear of the mob as a destabilizing social factor. As Michel Foucault has argued, it was in the period immediately prior to Malthus that the conception of 'population' as an object to be controlled, manipulated, and managed by states clearly emerged as an important factor in modern modes of governmentality.[13] In a partial reversal of Malthus' concerns, Halford Mackinder wrote a century later about the need for 'manpower' as a key component of imperial defence.

Fear of 'over'-population and social hardship has been a recurring political theme through the Cold War, albeit one that was less prominent than concerns with superpower rivalry. Harrison Brown's *The Challenge of Man's Future*, published in the early 1950s, was a discussion of then contemporary Malthusian themes.[14] A generation later Paul Ehrlich published *The Population Bomb* which generated considerable controversy with its dire predictions of future catastrophe.[15]

Following the much-publicized African famines of the 1980s, Paul Ehrlich returned to his earlier themes of population growth in a new book called *The Population Explosion*, where he argued that the 'bomb' he warned of earlier had now exploded, with huge numbers of people dying each year from hunger and hunger-related diseases.[16] *Beyond the Limits* was published as a sequel to the *Limits to Growth* in 1992, suggesting policy options to be taken to prevent 'overshoot' and collapse by working toward a sustainable society.[17] While estimates of how many people the planet can feed vary widely depending on assumptions about technology, diet, distribution of wealth, water resources, and calculations of the availability of arable land, the logic of this

type of thinking suggests that disaster will occur as 'natural' limits are reached.[18] Many of these themes have also appeared fairly regularly in large-circulation American magazines since the beginning of the Cold War.[19]

Given these themes, Kaplan is in some ways a continuation of long-established lines of argument. But he is new in that his powerful articulation of environment as the cause of threats to national security has updated Malthusian themes and brought the 'environmental security' policy discussions forcefully to the attention of a wider public. In doing so Kaplan revisits many of the geopolitical assumptions in security thinking, and does so in specifying the environment as a threat. This use of specific geopolitical assumptions to frame the demographic and related environmental dimensions in post-Cold War security thinking is a focus in what follows. In the case of neo-Malthusianism and the more general policy discourse of 'environmental security', the 'threat' is often at least partly from somehow external 'natural' or 'environmental' phenomena. More specifically, Kaplan's essay can be read as an analysis of, in Ó Tuathail and Luke's terms, the 'wild' zones of the new geopolitical (dis)order where the potential for disruptive incursions into the 'tame' zones of postmodern prosperity requires their containment, if necessary by military force.[20]

But as the analysis of Robert Kaplan's article makes particularly clear, the geopolitical formulations in American political discourse are not simply a continuation of Cold War themes. The new danger of environmental degradation is accentuated here, as are demographic concerns, while old concerns about access to resources are often downplayed or ignored. Africa in particular is now understood not as a security commodity, which is significant as a place of superpower rivalry and mineral supplies, but as a source of political instability that may, if unchecked by security measures, spread further afield to threaten areas of Northern affluence.

In an ironic reprise of earlier American cultural themes of a hostile nature that needed to be 'tamed', 'domesticated', and rendered benign by colonization of the 'frontier', 'the environment' has been specified as that which is foreign and threatening.[21] As writers have made clear, metaphors of wars with nature are not new; but this paper argues that the explicit linkage of military metaphors of nature as a hostile force with geopolitical threats to national security gives these themes a new and potentially ominous twist.[22]

Robert Kaplan's 'Coming Anarchy'

Kaplan's article pulls no punches in its pessimistic vision of environmentally induced social collapse, spreading disease and crime. With armed gangs of 'technicals', inspired by 'juju spirits', in West Africa and the widespread collapse of social order in Asia and Yugoslavia, the nation-state is, he argues, quickly becoming a political formation of the past, and sovereignty is now a dated fiction derived from the cartographic practices of another era.

The magazine's designers powerfully reinforce the message. The front cover illustration shows a crumpled map of the world starting to burn on a wood floor, the flames rising into words superimposed on the wall behind. In bold capitals they ominously announce.

> The coming anarchy: Nations break up under the tidal flow of refugees from environ-
> mental and social disaster. As borders crumble, another type of boundary is erected—a
> wall of disease. Wars are fought over scarce resources, especially water, and war itself be-
> comes continuous with crime, as armed bands of stateless marauders clash with the pri-
> vate security forces of the elites. A preview of the first decades of the twenty-first century.

The article is accompanied by stark photographs. The opening pages depict armed
soldiers walking past human skeletal remains in Liberia. Photographs of roadside
warnings of 'killing zones' in Sierra Leone, of mass graves in Bosnia, and of Kurdish
guerrillas in Turkey are followed by pictures of human corpses, the consequences of
violent retribution in Liberia and Vukovar. Pictures of 'the press of population', show-
ing buses amid crowds in Lagos and people doing their washing in an Abidjan lagoon
as well as other photographs of Southern cities, suggest overcrowding. The final pho-
tograph is of looters in the riots following the trial of police officers in the Rodney
King case in Los Angeles, suggesting that the scenes in the earlier depictions were
intimations of things to come in the United States. The theme of 'ethnic' conflict is
prominent.

Kaplan starts with West Africa, where he argues that crime is the order of the day
or, more specifically, the order of the night, when what tentative authority govern-
ments have dissipates as youthful criminals take to the streets. We are told that organ-
ized crime is related to the collapse of the nation-state and the rise of demographic
and environmental stresses. Drug cartels and private security forces take over where
social stress has led to the collapse of more conventional political order. To Kaplan
this is clearly the future of global politics, a spectre that confronts 'our' civilization
and one that conjures up '… Thomas Malthus, the philosopher of demographic
doomsday, who is now the prophet of West Africa's future. And West Africa's future,
eventually, will also be that of most of the rest of the world.'[23] Picking up on another
theme in the contemporary popular geopolitical imagination, the spread of deadly
diseases, Kaplan portrays them, and new forms of antidote-resistant malaria in par-
ticular, as an emerging impenetrable barrier closing the whole African continent off
from the rest of the world even as its internal state boundaries crumble.[24] The only
exceptions to this exclusion by the 'wall of disease' are likely to be coastal trading-posts.

This introduces the environmental theme framed in terms of extensive shanty
towns on the urbanizing coast of West Africa. 'In twenty-eight years Guinea's popula-
tion will double if growth goes on at current rates. Hardwood logging continues at
madcap speed, and people flee the Guinean countryside for Conakry. It seemed to me
there that here, as elsewhere in Africa and the Third World, man is challenging nature
far beyond its limits, and nature is now beginning to take its revenge.'[25] But quite what
the mechanism is that drives the migration is not explained; the text merely suggests
that it is related to deforestation. Africa may, he suggests, be like the Balkans 100 years
ago, a harbinger of an old (imperial) order collapsing and giving way to nations based
on tribe. But a century later the analogy contains a fundamental difference: 'Now the
threat is more elemental: *nature unchecked.*'[26]

Environmental scarcity is the first of the concepts that one must look at to under-
stand Kaplan's new world. It is linked to cultural and racial clashes, geographical

'destiny', and the transformation of warfare. Looking in turn at these themes allows Kaplan to sketch out the map of the new political situation. Of prime importance to all these matters is the environment. In the pivotal passage in his article, reproduced above at the beginning of this paper, he draws on the themes from the more pessimistic 'environmental security' literature, to argue that the environment is the national-security issue of the near future.[27] This is no small claim. It suggests that the fate of modern states is now tied directly to the fate of environments around the world. Ecological disruptions are now to be feared—the environment understood as 'a hostile power'.

The specific intellectual inspiration claimed for this re-imagining of American security policy is Thomas Homer-Dixon, whose 1991 *International Security* article, 'On the Threshold: Environmental Changes as Causes of Acute Conflict', is admiringly cited.[28] The thrust of Homer-Dixon's article suggests to Kaplan that growing scarcity of resources in many places coupled with increasing population numbers may lead to social pressures, increased migration, environmental refugees, and inter-group conflict in many places. According to Kaplan, Homer-Dixon's research can be interpreted to suggest that the environmental degradation in the developing world 'will present people with a choice that is increasingly among totalitarianism (as in Iraq), fascist-tending mini-states (as in Serb-held Bosnia), and road warrior cultures (as in Somalia)'.[29] The implication is that all these developments threaten political stability and hence, at least indirectly, the security of Northern states. Environmental degradation may well lead to war.[30]

The clashes between groups that are likely to result from identity conflicts induced by environmental degradation are, Kaplan argues, probably going to occur along lines of tribal and cultural fracture. In making this case he uses Samuel Huntingdon's much-cited *Foreign Affairs* article 'The Clash of Civilizations', which suggested that long-term cultural divisions were likely to determine the pattern of post–Cold War geopolitics. Kaplan argues that because Huntingdon's argument is painted with such a broad brush some of the details are inaccurate.[31] The clashes in the Caucasus are a matter of cultural identity and Turkish versus Iranian civilizations, rather than a clear battle between the forces of Christianity and Islam, as Huntingdon's thesis suggests. Kaplan points to the continued struggles between the Turkish state and the Kurdish population in Eastern Turkey as a contest of great importance for the future of the Middle East, not least because of the presence in this region of major Turkish hydroelectric projects that control crucial water flows into Syria and Iraq.

These specifications of identity in terms of cultures link the text to another theme of classical geopolitics, the focus on 'organic communities' as the preferred political communities. As Ó Tuathail notes, Mackinder's political thinking, often remembered in the terms of the quotation introducing this paper as relating to matters of 'geopolitics' (a term Mackinder didn't like), is perhaps better understood in terms of conservative nostalgias for stable cultural identities which support political stability.[32] The organic assumption of stable cultural identities plays into support for clan, tribe and nation, and becomes particularly powerful when coupled to claims to territory and sovereignty. As in Huntingdon's analysis, 'eternal' social essences and identities are invoked in the face of dramatic social and political change. For Kaplan only

Huntingdon's *scale* is wrong: politics is about geopolitical identities that suggest permanent fissures between potentially warring parties.

Kaplan ends his article by arguing that coherent national states are a fading political phenomenon that conventional political cartographies no longer accurately represent, and by speculating on the future of India and Pakistan as their burgeoning populations, with long histories of collective violence, face the future on a dwindling resource base. Add to this speculations about global climate change and the future of political order in states like Egypt, and the potential for drastic political upheaval seems huge. Even the United States may not survive, given its ethnic tensions and individualist culture. These tensions might well be aggravated by African disasters, as Afro-Americans demand American actions to provide help to stricken populations. The final few paragraphs comment on the author's return to the United States after his research trip for this article and the sight of laptop computer-equipped business people at Kennedy Airport on their way to Tokyo and Seoul. No such people were boarding planes to Africa. The suggestion is once again of two worlds with little connection.

Some months after the article's publication, political violence tore Rwanda apart and media reports of 'tribal' slaughter apparently confirmed Kaplan's nightmarish vision.[33] The stark prose and violent images in Kaplan's article capture the alarmist themes of contemporary neo-Malthusianism. While other articles in policy journals and books by authors as prominent as Paul Kennedy discuss these demographic and environmental themes, Kaplan's article is significant in the bluntness with which he gives these themes widespread popular exposure. As such, his text is the most high-profile exemplar of the alarmist streams in the larger policy discourse of 'environmental security'.

Robert Kaplan's Geopolitical Imagination

However, the world is not quite so conveniently simple as Kaplan's popularization of environmental degradation as the key national security issue for the future suggests. His article, for all its dramatic prose and empirical observation, is vulnerable to numerous critiques. If one reads it as a cultural production of considerable political importance it is fairly easy to see how the logic of the analysis, premised on 'eye-witness' empirical observation, and drawing on an eclectic mixture of intellectual sources, leaves so much of significance unsaid. But the impression, as has traditionally been the case in geopolitical writing, generated from the juxtaposition of expert sources and empirical observation is that this is an 'objective', detached geopolitical treatise. Detailed critique of the epistemologies of both traditional and contemporary geopolitics has been developed elsewhere.[34] The focus in what follows is on the political implications of the widely shared geopolitical assumptions that structure this text and ultimately render the environment as a threat.

The most important geopolitical premise in the argument posits a 'bifurcated world', one in which the rich in the prosperous 'post-historical' cities and suburbs have mastered nature through the use of technology, while the rest of the population

is stuck in poverty and ethnic strife in the shanty towns of the under-developed world.[35] The presentation of the article in the magazine supports this basic formulation of the world into the rich, who read magazines like *Atlantic*, and the rest, who don't.

Insofar as politics is defined in terms of the articulation of discourses of danger, Kaplan's analysis can be read in terms of a persistent textual dualism between postmodern consumer aspirations and fear of 'reprimitivized' violence and environmental degradation.[36] The presentation of a bifurcated world is powerfully reinforced by the dramatic contrasts between the advertisements and the images and content of the text. All the advertisements suggest the symbols of consumer affluence: three are for automobiles, one for gin, two for stereophonic audio equipment, one for a book club, and another for compact discs. Nothing unusual here. But on closer inspection these advertisements speak volumes about the geopolitics of the contemporary world. Where the article uses the metaphor of stretched limousines for the affluent, driving over potholed streets in New York, the automobile advertisements show the luxury interior of one vehicle, another parked beside a traditional brick house in a state of apparently rural bucolic bliss. The Saab advertisement, stretching over three pages, emphasizes the achievements of high-technology engineering.

But the juxtaposition of the two worlds of aspiration and fear can be taken further. Where the article talks of non-Western cultures in conflict, and of slums that are described as so appalling that not even Charles Dickens would give them credence, the book of the month club advertisement is for a twenty-one-volume collection of Dickens' works. The advertisement for a Bose radio is focused on a Stradivarius violin. The advertisement for a Sony CD player shows a grand piano and a Sony scholarship-winning Juilliard School pupil, cultural artifacts far removed from juju spirits, animism, or even Islam. The appreciative student pianist endorsing Sony contrasts dramatically with the mention in the text of the article of Solomon Anthony Joseph Musa, a coup leader in Sierra Leone who, it is claimed, 'shot the people who had paid for his schooling, "in order to erase the humiliation and mitigate the power his middle class sponsors held over him".[37] The final advertisement, for Columbia House compact discs focuses, in a truly bizarre irony, on the history of the blues!

Perhaps most geopolitically revealing, however is the advertisement for 'Bombay Sapphire Distilled London Dry Gin'. The juxtaposition of Bombay and London, along with the image of Queen Victoria on the label on the bottle, suggests the legacy of colonialism and the commercial advantages gained by European powers in earlier geopolitical arrangements. In all of Kaplan's article such matters of international trade are barely mentioned. The wall of disease may bar many foreigners from all except some coastal trading posts of Africa in the future, but the significance of what is being traded and with what implications for the local environment is not investigated. 'Hot cash', presumably laundered drug money from African states, apparently does flow to Europe, we are told, but this has significance only because of the criminal dimension of the activity, not as part of a larger pattern of political economy. While the lack of business people flying to Africa is noted, comments about the high rate of logging are never connected to the export markets for such goods, or to the economic circumstances of indebted African states that distort local economies to pay international loans and meet the requirements for structural adjustment programmes.[38]

Logging continues apace, but it is apparently driven only by some indigenous local desire to strip the environment of trees, not by any exogenous cause. A focus on the larger political economy driving forest destruction would lead the analysis in a very different direction, but it is a direction that is not taken by the focus on West Africa as a quasi-autonomous geopolitical entity driven by internal developments.

The political violence and environmental degradation are not related to larger economic processes anywhere in this text. These sections of Kaplan's text show a very limited geopolitical imagination, one that focuses solely on local phenomena in a determinist fashion that ignores the larger trans-boundary flows and the related social and economic causes of resource depletion. Kaplan ignores the legacy of the international food economy, which has long played a large role in shaping the agricultural infrastructures, and the nutritional levels, of many populations of different parts of the world in specific ways.[39] He also ignores the impact of the economic crisis of the 1980s and the often deleterious impact of the debt crisis and structural adjustment policies. He completely misses their important impact on social patterns and on rural women, who suffered many of the worst effects.[40]

Ironically, while Kaplan emphasizes the inadequacies of maps for understanding ethnic and cultural clashes, he never investigates their similar inadequacies for understanding economic interconnections as an important part of either the international relations or the foreign policies of these states.[41] This crucial omission allows for the attribution of the 'failure' of societies to purely internal factors. Once again, the local environment can be constructed as the cause of disaster without any reference to the historical patterns of development that may be partly responsible for the social processes of degradation.[42]

Given the focus of most Malthusians on the shortage of 'subsistence' and resources in general, there is remarkably little investigation of how the burgeoning populations of various parts of the world are actually provided for, in terms either of food production or of other daily necessities. Despite accounts of trips across Africa by 'bush-taxi', agricultural production remains invisible to Kaplan's 'eye-witness'. While cities are dismissed as 'dysfunctional', the very fact that they continue to grow despite all their difficulties suggests that they do 'function' in many ways. Informal arrangements and various patterns of 'civil society' are ignored. People move to the cities, but quite why is never discussed in this article; imprecise references to degraded environments and the world soil degradation map on Thomas Homer-Dixon's office wall are all that is offered.[43] There is no analysis here of traditional patterns of subsistence production and how they and access to land may be changing in the rural areas, particularly under the continuing influence of modernization.[44] While it is made clear that traditional rural social patterns fray when people move to the very different circumstances of the city, the reasons for migration are assumed but never investigated. In Homer-Dixon's language, absolute scarcity is assumed and the possibilities of relative scarcity, with the negative consequences for poor populations due to unequal distribution or the marginalization of subsistence farmers as a result of expanded commercial farming, is never investigated.[45] Here, resurgent cultural fears of 'the Other' and assumptions about the persistence of cultural patterns of animosity and social cleavage are substituted for analysis of resources and rural political ecology. Precisely where the

crucial connections between environmental change, migration, and conflict should be investigated the analysis turns away to look at ethnic rivalries and the collapse of social order. The connections are asserted, not demonstrated, and in so far as this is done the opportunity for detailed analysis is missed and the powerful rhetoric of the argument retraces familiar political territory instead of looking in detail at the environment as a factor in social change. In this failure to document the crucial causal connections in his case, Kaplan ironically follows Malthus, who relied on his unproven key assumption that subsistence increases only at an arithmetical rate in contrast to geometric population growth.

Political angst about the collapse of order is substituted for an investigation of the specific reasons for rapid urbanization, a process that is by default rendered as a 'natural' product of demographic pressures. This unstated 'naturalization' then operates to support the Malthusian fear of poverty-stricken mobs—or, in Kaplan's terms, young homeless and rootless men forming criminal gangs—as a threat to political order. Economics becomes nature, nature in the form of political chaos becomes a threat: the provision of security from such threats thus becomes a policy priority. In this way 'nature unchecked' can thus be read directly as a security threat to the political order of postmodernity.

Geopolitics, Malthus, and Kaplan

Kaplan explicitly links the Malthusian theme in his discussion of Africa to matters of national security, where a clear 'external' threatening dimension of crime and terrorism is linked to the policy practices of security and strategic thinking. The logic of a simple Malthusian formulation is complicated by the geographical assumptions built into Kaplan's argument, while he has simultaneously avoided any explicit attempt to deal with the political economy of rural subsistence or contemporary population growth. Thus, in his formulation, the debate is shifted from matters of humanitarian concern, starvation, famine relief, and aid projects and refocused as matters of military threat and concern for political order within Northern states.

What ultimately seems to matter in this new designation is whether political disorder and crime will spill over into the affluent North. The affluent world of the *Atlantic* advertisements with their high-technology consumer items is implicitly threatened by the spreading of 'anarchy'. The article implies that it has done so already insofar as American inner cities are plagued with violent crime. The reformulation once again posits a specific geopolitical framework for security thinking. Kaplan himself suggests that by his own logic the US may become more fragmented and Canada may dissolve following the secession of Quebec, shorn of its Northern resource hinterland. He even argues that Quebec, supposedly a culturally homogeneous society, may end up being the most stable region of North America. What cannot be found in this article is any suggestion that the affluence of those in the limousine might in some way be part of the same political economy that produces the conditions of those outside.

Although Kaplan is particularly short on policy prescription in his *Atlantic* article, some of the implications of his reworked Malthusianism do have clear policy

implications. Instead of repression and the use of political methods to maintain in-equalities in the face of demands for reform, Kaplan's implicit geopolitics suggest abandoning Africa to its fate. If more Northern states withdraw diplomatic and aid connections and, as he notes, stop direct flights to airports such as Lagos, the potential to isolate this troubled region may be considerable. Once again, security is understood in the geopolitical sense of containment and exclusion.

In a subsequent article in the *Washington Post*, Kaplan explicitly argues against US military interventions in Africa.[46] He suggests that intervention in Bosnia would do some good, because the developed nature of the societies in conflict there allows some optimism that a political settlement is workable. The chances of intervention having much effect in Africa are dismissed because of the illiterate, poverty-stricken populations there. However, the pessimism of the *Atlantic* article is muted here by a contradictory suggestion that all available foreign-policy money for Africa be devoted to population control, resource management, and women's literacy. These programmes will, Kaplan hopes, in the very long term resolve some of the worst problems, allowing development to occur and 'democracy' eventually to emerge. The ethnocentrism of the suggestion that Africa's problems are soluble in terms of modernization is coupled with the implication that West Africa is of no great importance to the larger global scheme of power and economy, and therefore can be ignored, at least as long as the cultural affinities between Africans and African-Americans do not cause political spill-overs into the United States. Precisely this marginalization is of concern to many African leaders and academics. But in stark contrast to Kaplan, many Africans emphasize the need to stop the export of wealth from the continent, and the need to draw on indigenous traditions to rebuild shattered societies and economies.[47]

There is an ironic twist in Kaplan's geopolitical specifications of 'wild zones'. He argues that they are threats to political stability and, in the case of Africa, probably worth cutting loose from conventional political involvement. In the subsequent *Washington Post* article he argues against military interventions in Africa on the basis of their uselessness in the political situation of gangs, crime, and the absence of centralized political authority. His suggestions imply that interventions are only considered in terms of political attempts to resolve conflicts and provide humanitarian aid. In this assumption Kaplan is at odds with Cold War geopolitical thinking. While ignoring the political economy of under-development as a factor in the African situation, he also ignores the traditional justifications for US political and military involvement in Africa and much of the Third World. Through the Cold War these focused on questions of ensuring Western access to strategic minerals in the continent. This theme continues to appear in many other discussions of post–Cold War foreign policy and in US strategic planning.[48] But Kaplan ignores both these economic interconnections and their strategic implications, preferring an oversimplified geopolitical specification of Malthusian-induced social collapse as the sole focus of concern.

But the specification of danger as an external 'natural' phenomenon works in an analogous way to the traditional political use of Neo-Malthusian logic. Once again threats are outside human regulation, inevitable and natural in some senses—if not anarchic in the neo-realist sense of state system structure, then natural in a more fundamental sense of 'nature unchecked'. By the specific spatial assumptions built

into his reasoning, Kaplan accomplishes geopolitically what Malthusian thinking did earlier in economic terms. Coupled with prevalent American political concerns with security as 'internal' vulnerability to violent crime, and 'external' fears of various foreign military, terrorist, economic, racial, and immigration 'threats', Kaplan rearticulates his modified Malthusianism in the powerful discursive currency of geopolitics. His themes fit neatly with media coverage of Rwanda and Somalia, where his diagnosis of the future appeared in many media accounts to be occurring nearly immediately.[49]

Understood as problems of 'tribal' warfare, such formulations reproduce the earlier tropes of 'primitive savagery'. As other commentators on contemporary conflict have noted, detailed historical analysis suggests that the formation of 'tribes', and many of the 'tribal wars' that European colonists deplored, were often caused by the sociological disruptions triggered by earlier European intrusions. Denial or failure to understand the causal interconnections of this process allowed for the attribution of 'savagery' to 'Others' inaccurately specified as geographically separate.[50] Kaplan notes that the disintegration of order is not a matter of a 'primitive' situation but, following van Creveld, a matter of 'reprimitivized' circumstances in which high-technology tools are used for gang and 'tribal' rivalries. But the economic connections that allow such 'tools' to become available are not mentioned. Thus reprimitivization is specified as the indirect result of environmental degradation, a process that is asserted frequently but not argued, demonstrated, or investigated in any detail.

The Rest against the West

One important theme in contemporary discussions of Northern 'security' is mentioned only in passing in Kaplan's analysis. This is the theme of massive long-distance migration and the likely social consequences.[51] In contrast, Matthew Connelly and Paul Kennedy's later article in the *Atlantic Monthly* looked specifically at migrations of impoverished humanity in motion as the global order changes at the end of the Cold War.[52] The environmental theme is of less salience in their article, which focuses more explicitly on strictly demographic matters. In the context of current fears about illegal migration in both Europe and the United States, they look to Malthusian speculations about global demography and return to Kishore Mahbubani's phrase to raise the question of whether 'demographic politics' has to be played out in a geopolitical conflict between 'the rest' and 'the West'.[53] In particular, they focus on 'the key global political problem of the final years of the twentieth century: unbalanced wealth and resources, unbalanced demographic trends, and the relationship between the two'.[54] In contrast to Kaplan, who is concerned with the spill-over from the wild zones to the tame ones but who never looks seriously at international migration as a mechanism for this 'danger', Connelly and Kennedy examine this geopolitical factor directly.

Where Kaplan relies on his 'eye-witness' journalistic accounts to set up his larger discussion, Connelly and Kennedy start with Jean Raspail's controversial early 1970s French novel *The Camp of the Saints*, focusing on its dramatic story of impoverished Indians hijacking ships and setting forth across the oceans for France. Again, the designers of the *Atlantic Monthly* use a dramatic cover illustration, framed again in

spatial terms of the tension between fear and aspiration, to emphasize the theme of the article. It shows a pale-skinned suburban householder equipped with a spatula and wearing an apron emblazoned with the motif 'home sweet home'. Accompanied by his dog, he is standing on a patio beside a barbecue which is cooking wieners. The suburban ideal is marred only by the many dark-skinned faces, some clad in various 'ethnic' headgear, who are looking over the white picket fence surrounding his yard. The text superimposed on the fence summarizes the theme of the article: 'Whether it's racist fantasy or realistic concern, it's a question that won't go away: As population and misery increase, will the wretched of the earth overwhelm the Western paradise?' The article argues that Raspail is in many places guilty of a variety of racist sentiments but that the themes in this disturbing novel are germane to current discussions of foreign policy and the focus in the US on immigration. In particular, the relative decline of the European races in terms of total numbers of population suggests the inevitable triumph of the former colonized peoples who will in the next few decades, as European populations atrophy, reverse the geopolitical patterns of North and South.

While the neo-Malthusian framework is in the presentation of the argument in terms of massive dislocations and migrations from the poor to the rich world, this article's conclusions are notably different from Kaplan's geopolitical pessimism. It notes the arguments by the technological optimists, in response to Kaplan's despair, that global economic indicators show widespread signs of optimism, but suggests that this optimism is not in any practical way linked to the fate of the poorest billions of the world's population.[55] Connelly and Kennedy also point out that, while production has been globalized, the mobility of labour has not. Geographical restrictions on the mobility of workers are in dramatic contrast to the ability of transnational corporations to switch production and investments around the globe.[56] Even if the 'techno-liberal' optimists are correct and growth does occur, it seems likely that, given population growth, the absolute, if not relative, numbers of very poor will increase.

Drawing on the elaborated speculations in Kennedy's earlier book, *Preparing for the Twenty-First Century*, the article offers much greater recognition of the interconnectedness of global problems, and proffers suggestions for policy initiatives that tackle poverty and related economic and environmental issues.[57] The scenario of desperate, impoverished people attempting to move to the affluent world, and the unpleasant policy implications of trying to resist such migrations by force, are merely hinted at. But unlike Kaplan, with his unexamined assumptions of environmental degradation, the geopolitical version of the Malthusian scenario is not judged to be inevitable. Instead, they argue the case for a new North–South political deal in which global cooperation is seen as necessary by political leaders. They admit that transcending partisan and national perceptions of political possibilities and difficulties may not be easy, but argue that it is clearly necessary to deal with 'global' problems.

Beyond Malthus and Mackinder?

Nonetheless, the continued possibilities of using Malthusian themes as ideological weapons by the powerful in justifying repression, or at the least justifying inaction in

the face of gross inequities, now has to be complemented by a recognition that these themes can be mobilized in foreign-policy discourse to suggest the appropriateness of military solutions to demographic and 'environmental' problems. At least in the earlier version of his famous essay, Malthus argued that population growth is inevitable, natural, and largely beyond human regulation.[58] Politics is thus rendered as just a reaction to the consequences of the unchangeable patterns of fecundity. Further, he argued, it occurs in such a manner that helping the poor is counterproductive. In Abernethy's rejoinder to Connelly and Kennedy, she argues that development assistance to poor states often actually renders their populations more fertile by raising hopes which development projects ultimately fail to deliver, hence aggravating the problem of population numbers.[59] If the political consequences of population growth are disruptive to the Northern geopolitical order that is judged to be the only acceptable one, then neo-Malthusianism acts as a powerful intellectual weapon in formulating policies to repress and politically control reformist demands for greater equality or economic redistribution. It can do so on the grounds that such policies only aggravate adverse demographic trends. When coupled with Kaplan's assertions that population growth is related to environmental degradation, the argument is strengthened.

If the more alarmist versions of some of Kaplan's arguments gain credence in Washington, or if the formulation of politics in terms of the rest and the West becomes prominent, then the dangers of a new Cold War against the poor are considerable. The discussions of illegal immigration in the US in the early 1990s, and suggestions that the solution is increased border guards, denial of services to immigrants incapable of proving legal residence, and deportations, suggest that the geopolitical imagination of spatial exclusion is dominating the policy discourse once again. In particular this may be because of the propensity among American politicians to formulate American identity in antithesis to external perceived dangers. Through the history of the last two centuries this has been a powerful theme in the formulation of American foreign policy which has drawn on the related discourses of American exceptionalism.[60]

This geopolitical imagination has been frequently coupled with assertions of cultural superiority and ideological rectitude in the form of various articulations of moral certainty. The dangers of ethnocentrism, when coupled with geopolitical reasoning, are greatest precisely where they assert strategic certainty in ways that prevent analysis of the complex social, political, and economic interactions that might lead to assessments that in at least some ways 'the problem is us'.[61]

All this suggests the need for continued challenges to the use of traditional geopolitical reasoning in the formulation of foreign policy and in the study of the discourses of contemporary international politics. Geographical complexity, and in particular detailed local environmental investigations and trans-boundary economic interconnections, may not provide grisly images and spectacular headlines; but it seems a reasonable bet that such geographs offer better possibilities for the demilitarization of international politics, the amelioration of environmental problems, and the resolution of at least some of the difficulties induced by economic change and migration.

NOTES

1. Thomas Malthus, *An essay on the principle of population* (Harmondsworth, Penguin, 1970: original edn 1798), p. 71.

2. Halford J. Mackinder, 'The geographical pivot of history', *Geographical Journal* **23**(4) (1904), repr. in R. Kasperson and J. Minghi, eds., *The structure of political geography* (Chicago, Aldine, 1969), p. 161.

3. Robert D. Kaplan, 'The coming anarchy', *Atlantic Monthly* **273**(2) (1994), p. 58.

4. It has apparently received a wide readership. The article was reproduced in the *San Francisco Chronicle* on Sunday 13 Mar. 1994, and has been commented on by media columnists including Anthony Lewis in the *New York Times* ('A bleak vision', 7 Mar. 1994, p. A17). It has been cited, in a diverse range of languages, in articles concerned in one way or another with visions of the future, in academic and policy journals ranging from sociological theory in the Czech *Sociologicky Casopis* to design philosophy in *Ergonomics.*

5. G. Meyers, T. Klak, and T. Koehl, 'The inscription of difference: news coverage of the conflicts in Rwanda and Bosnia', *Political Geography* **15** (1) (1996), pp. 21–46.

6. I. Bellany, 'Malthus and the modern world', *Review of International Studies* **20**(4) (1994), pp. 411–22.

7. On the importance of geopolitical discourse and its assumptions in foreign policy formulation at the largest scales, see J. Agnew and S. Corbridge, *Mastering space: hegemony, territory and international political economy* (London, Routledge, 1995).

8. S. Dalby, 'The threat from the south:', in D. Deudney and R. Matthews, eds, *Contested grounds: security and conflict in the new environmental politics* (Albany, State University of New York Press, 1996); Vandana Shiva, 'Conflicts of global ecology: environmental activism in a period of global reach', *Alternatives* **19**(2) (1994), pp. 195–207.

9. J. Kakonen, ed. *Green security or militarized environment* (Aldershot, Dartmouth, 1994); G. Prins, ed., *Threats without enemies: facing environmental insecurity* (London, Earthscan, 1993).

10. Although now long past its period of greatest influence in American political and cultural life a century ago, the *Atlantic,* with a circulation of 450,000, continues to be an important vehicle for discussion of cultural and political topics in the United States. On the early history, see E. Sedgewick, *The Atlantic Monthly, 1857–1909* (Amherst, University of Massachusetts Press, 1994).

11. M. A. Levy, 'Is the environment a national security issue?', *International Security* **20**(2) (1995), p. 35; President Clinton's remarks to the National Academy of Sciences, 29 June 1994, are summarized in the Woodrow Wilson Centre *Environmental change and security project report* **1** (1995), p. 51.

12. Geoffrey D. Dabelko, 'Environmental security: the parameters of the U.S. debate', paper presented to a conference on 'New frontiers in international security', Rosslyn, VA, Oct. 1995.

13. M. Foucault, 'Governmentality', in G. Burchell, C. Gordon, and P. Miller, eds, *The Foucault effect* (Chicago, Chicago University Press, 1991), pp. 87–104.

14. H. Brown, *The challenge of man's future* (New York, Viking, 1954). There is an interesting precursor to Kaplan's use of Fukuyama in the bibliographical essay at the end of Brown's book. He also cites a title with the term 'post-historic' in it: R. Seidenberg, *Post-historic man* (Durham, University of North Carolina Press, 1950).

15. P. R. Ehrlich, *The population bomb* (New York, Ballantine, 1968).

16. P. R. Ehrlich and A. H. Ehrlich, *The population explosion* (New York, Simon & Schuster, 1990).

17. D. H. Meadows, D. L. Meadows, and J. Randers, *Beyond the limits* (London, Earthscan, 1992).

18. V. Smil, 'How many people can the earth feed?', *Population and Development Review* **20**(2), (1994), pp. 255–92.

19. J. R. Wilmoth and P. Ball, 'The population debate in American popular magazines', *Population and Development Review* **18**(4) (1992), pp. 631–68.

20. G. Ó Tuathail and T. W. Luke, 'Present at the (dis)integration: deterritorialization and reterritorialization in the new wor(l)d order', *Annals of the Association of American Geographers* **84** (3) (1994), pp. 381–98. They note that 'wild' and 'tame' zones can be read from Samuel Huntingdon's widely cited 'The clash of civilizations', *Foreign Affairs* **72**(3) (1993), pp. 22–49, and is a particularly salient theme in M. Singer and A. Wildavsky, *The real world order: zones of peace, zones of turmoil* (Chatham, NJ, Chatham House, 1993).

21. There is a vast literature, not only in the pages of this journal, on the themes of the domination of nature and its philosophical roots; see e.g. William Leiss, *The domination of nature* (Boston, Beacon, 1974) and Carolyn Merchant, *The death of nature: women, ecology and the scientific revolution* (San Francisco, Harper & Row, 1980), as well as such themes as pastoral ideals in American thought in books like Leo Marx, *The machine in the garden* (New York, Oxford University Press, 1964). This article, however, traces the logic of Kaplan's writing in terms of the appropriation of the environment as a security threat in post-Cold War political thinking. Undoubtedly Kaplan's analysis in part finds its resonance with its audience because of the cultural ambiguities in the multiple constructions of 'nature' and 'wilderness', but such a reading is not the focus of this analysis.

22. e.g. John McCannon, 'To storm the Arctic: Soviet polar exploration and public visions of nature in the USSR, 1932–1939', *Ecumene* **2**(1) (1995), pp. 15–31.

23. Kaplan, 'The coming anarchy', p. 48.

24. See L. Garrett, *The coming plague: newly emerging diseases in a world out of balance* (New York, Farrar Strauss, 1994); R. Preston, *The hot zone* (New York, Random House, 1994), which inspired the movie *Outbreak*, and episodes of *The X-Files* television drama through 1994 and 1995.

25. Kaplan, 'The coming anarchy', p. 54.

26. *Ibid.*

27. See in general N. Myers, *Ultimate security: the environmental basis of political stability* (New York, Norton, 1993); D. Pirages, 'Demographic change and ecological security', in M. T. Klare and D. C. Thomas, eds, *World security: challenges for a new century* (New York, St Martin's Press, 1994), pp. 314–31.

28. T. Homer-Dixon, 'On the threshold: environmental changes as causes of acute conflict', *International Security* **16**(1) (1991), pp. 76–116.

29. Kaplan, 'The coming anarchy', p. 59.

30. Kaplan's article went to press before the appearance of Homer-Dixon's later *International Security* article that modified his earlier hypotheses. See T. Homer-Dixon, 'Environmental scarcities and violent conflict: evidence from cases', *International Security* **19**(1) (1994), pp. 5–40; but after the popular version of these findings was published, see T. Homer-Dixon, J. H. Boutwell, and G. W. Rathjens, 'Environmental change and violent conflict', *Scientific American* **268**(2) (1993), pp. 38–45. See also T. Homer-Dixon, 'Environmental and demographic threats to Canadian security', *Canadian Foreign Policy* **2**(2) (1994), pp. 7–40. These later articles suggest that as Homer-Dixon's research progressed, the earlier tentative hypotheses on which Kaplan builds his alarmist Malthusian interpretation were further qualified. Kaplan's summary is much more obviously Malthusian than Homer-Dixon's published research.

31. Huntingdon, 'The clash of civilizations'.

32. G. Ó Tuathail, 'Putting Mackinder in his place: material transformations and myth', *Political Geography* **11**(1) (1992), pp. 100–18.

33. R. D. Kaplan, 'Into the bloody new world', *Washington Post*, 17 Apr. 1994, pp. C1–2.

34. S. Dalby, 'Critical geopolitics: difference, discourse and dissent', *Environment and Planning D: Society and Space* **9**(3) (1991), pp. 261–83; G. Ó Tuathail, *Critical geopolitics* (Minneapolis, University of Minnesota Press, 1996).

35. Kaplan, 'The coming anarchy', p. 59. Kaplan cites Francis Fukuyama in relation to the designation 'post-historical'.

36. On 'discourses of danger', see M. Dillon, 'The alliance of security and subjectivity', *Current Research in Peace and Violence* **13**(3) (1991), pp. 101–24; and David Campbell and Michael Dillon, eds, *The political subject of violence* (Manchester, Manchester University Press, 1993).

37. Kaplan, 'The coming anarchy', p. 45. Thanks to Deepika Grover for pointing this out.

38. F. Cheru, 'Structural adjustment, primary resource trade and sustainable development in sub saharan Africa', *World Development* **20**(4) (1992), pp. 497–512.

39. J. Warnock, *The politics of hunger: the global food system* (London, Methuen, 1987).

40. F. Mackenzie, 'Exploring the connections: structural adjustment, gender and the environment', *Geoforum* **24**(1) (1993), pp. 71–87.

41. On the complicated interconnections of these themes in West Africa, see T. Shaw and J. E. Okolo, eds, *The political economy of foreign policy in ECOWAS* (New York, St Martin's Press, 1994).

42. This 'amnesia' is a recurring feature in many development discourses; see David Slater, 'The geopolitical imagination and the enframing of development theory', *Transactions of the Institute of British Geographers n. s.* **18** (1993), pp. 419–37, and Jonathan Crush, ed., *Power of development* (London, Routledge, 1995).

43. Vaclav Smil has noted that these maps offer information at such a level of generalization as to be effectively useless for detailed calculations of agricultural productivity. See V. Smil, 'Some contrarian notes on environmental threats to national security', *Canadian Foreign Policy* **2**(2) (1994), pp. 85–7.

44. R. L. Paarlberg, 'The politics of agricultural resource abuse', *Environment* **36**(8) (1994), pp. 7–9, 33–42. Some of the relations of modernization and rural conflict in Africa are explored in O. Bennet, ed., *Greenwar: environment and conflict* (London, Panos, 1991).

45. See D. J. Hogan, 'The impact of population growth on the physical environment', *European Journal of Population* **8** (1992), 109–23.

46. R. D. Kaplan, 'Into the bloody new world: a moral pragmatism for America in an age of mini-holocausts', *Washington Post*, 17 Apr. 1994, pp. C1–2.

47. See e.g. A. Adadeji, ed., *Africa within the world: beyond dispossession and dependance* (London, Zed, 1993); D. R. F. Taylor and F. Mackenzie, eds., *Development from within: survival in rural Africa* (London, Routledge, 1992); and more generally S. Amin, *Maldevelopment: anatomy of a global failure* (London, Zed, 1990).

48. See e.g. E. Anderson, 'The geopolitics of military material supply', *Geojournal* **31**(2) (1993), pp. 207–13; K. Butts, *The Department of Defense role in African policy* (Carlisle, PA, US Army War College Strategic Studies Institute, 1993); D. Volman, 'Africa and the new world order', *Journal of Modern African Studies* **31**(1) (1993), pp. 1–30. This discussion continues despite arguments that resource access issues are of declining importance because of technological innovation and global markets: see R. D. Lipschutz, *When nations clash: raw materials, ideology and foreign policy* (Cambridge, MA, Ballinger, 1989).

49. See N. Gibbs, 'Why? the killing fields of Rwanda', *Time*, 16 May 1994, pp. 21–7. In a reflection of Kaplan's themes, the caption under the heading of this feature article reads: 'Hundreds of thousands have died or fled in a month of tribal strife. Are these the wars of the future?'

50. N. L. Whitehead and R. B. Ferguson, 'Deceptive stereotypes about "tribal warfare"', *Chronicle of Higher Education*, 10 Nov. 1993, p. A48.

51. See O. Waever, B. Buzan, M. Kelstrup, and P. Lemaitre, *Identity migration and the new security agenda in Europe* (London, Pinter, 1993).

52. M. Connelly and P. Kennedy, 'Must it be the West against the rest?' *Atlantic Monthly* **274**(6) (1994), pp. 61–83.

53. K. Mahbubani, 'The West and the rest', *National Interest* (1992), pp. 3–13.

54. Connelly and Kennedy, 'Must it be …', p. 62.

55. On 'optimistic' rejoinders to the Kaplan thesis, see A. E. Server, 'The end of the world is nigh—or is it?', *Fortune*, 2 May 1994, pp. 123–4; M. Gee, 'Surprise! the world gets better!', *World Press Review* **14**(7) (July 1994), pp. 18–20.

56. See R. Barnet and J. Cavanagh, *Global dreams: imperial corporations and the new world order* (New York, Simon & Schuster, 1994).

57. P. Kennedy, *Preparing for the twenty-first century* (New York, HarperCollins, 1993).

58. As Vaclav Smil notes, the later, less frequently cited, versions included some guarded optimism about the possibilities of reconciling the growth of population with 'subsistence'. See Smil, 'How many'.

59. V. Abernethy, 'Optimism and overpopulation' *Atlantic Monthly* **274**(6) (1994), pp. 84–91; and in general V. Abernethy, *Population politics: the choices that shape our future* (New York, Plenum Press, 1993). Although her argument can be criticized because it presumes social stability, and patterns of reproductive behaviours that may not be appropriate assumptions for the poorest areas of the world, it does offer an alternative justification for modest grassroots aid projects aimed at the poorest sections of society. On how impoverishment of environmental resources can lead to increases rather than decreases in family size, see P. S. Dasgupta, 'Population, poverty and the local environment', *Scientific American* **272**(2) (1995), pp. 40–5.

60. D. Campbell, *Writing security: American foreign policy and the politics of identity* (Minneapolis, University of Minnesota Press, 1992).

61. T. Hentsch, *Imagining the Middle East*, trans. F. A. Reed (Montreal, Black Rose, 1992).

Large-Scale Economic Development

This section considers the effects of large-scale and long-term environmental change. Leslie White begins the section with a theory about the evolution of human energy use and, by implication, human effects on the environment. While White's evolutionary approach is largely out of step with current anthropology, his ideas of social progress through increased energy use resonate with the intellectual bases of many of today's development and modernization schemes. Furthermore, White's work raises questions about the relationship between the scale of human enterprises and their enduring effects on the environment. Following approaches in historical ecology, Charles Redman gives long-term depth to human environmental modifications, as he surveys the archaeological record for ecological change wrought by the growth of ancient cities. In modern times, large-scale development usually translates into efforts at industrialization, the object of James Ferguson's discussion in the section's third chapter.

Ferguson says that government development projects cause social as well as environmental problems. Vandana Shiva describes how development programs involve men and women differently, drawing a connection between sexism and environmental destruction. Shiva argues that those who benefit from economic development are rarely those who bear its costs. This polemical piece contrasts with Beckerman's chapter, in which he argues that economic development is necessary for environmental protection. Collectively, the contributions to this section ask, what is the goal of economic development? How do the problems of development overlap with those of environmental destruction? Does development inevitably destroy nature? In this section's final contribution, Alan Fricker explores definitions and possibilities for sustainable development. In comparison to Netting's earlier, pointed definitions of sustainability in smallholding agriculture, Fricker offers an expansive vision infused with spirituality.

This section's concern for the differences between policy ideas and practices bridges the abstract themes of previous sections with the following, more topical, chapters. This section also raises the issue of consumerism (addressed in Section 7) by questioning the consequences of certain kinds of economic behaviors. Much of the economic activity described in this section ultimately aims to increase the production and sale of consumer goods. Many people have responded to the environmental changes wrought by consumer-oriented industrialism by promoting concepts of sustainable development. Thematically, sustainable development reappears in Sections 4, 6, and 7. Recalling the optimism that infused earlier discourses about progress, enlightenment, and development, various contributors evaluate new ideas about harmony with nature in light of changing attitudes to earlier panaceas.

Energy and Tools

Leslie White

A culture, or sociocultural system,[1] is a material, and therefore a thermodynamic, system. Culture is an organization of things in motion, a process of energy transformations. Whether it be chipping an arrowhead, catching a fish, hoeing a hill of beans, avoiding your mother-in-law, calling your father's sister's son "father," performing a ritual, playing a game, regarding a churinga with awe, or breathing a silent prayer, the event is an expression of energy expended.[2] "Culture" is but the name of the form in which the life forces of man as a human being find expression. It is an organization of energy transformations that is dependent upon symboling.

Culture, as a thermodynamic system, may be analyzed into the following factors: energy, tools, and product. As we have seen, culture is a mechanism for serving the needs of man. And to do this it must harness energy and put it to work. The use of energy requires technological apparatus, and we may extend the use of the term *tools* to cover all the material means with which energy is harnessed, transformed, and expended. We shall designate all goods and services capable of serving the needs of man that have been produced or formed by the cultural use of energy, the *product*. Thus, catching fish, shooting game, making pottery, cutting hair, piercing ears for pendants, filing teeth for beauty's sake, weaving cloth, and a thousand and one other cultural processes are examples of the control and expenditure of energy by instrumental means in order to serve some need of man. We may, then, think of the culture process in terms of motive power, means of expression, and satisfaction of need. This conception can be expressed by a simple formula, $E \times T \rightarrow P$, in which E represents the energy involved, T the technological means of utilizing it, and P, the product or result which serves a need of man.

By *energy* we mean "the ability to do work." "… Energy and work are interchangeable terms" says Soddy;[3] one is defined in terms of the other. Thus, a stone is moved from here to there, or its shape is changed by chipping or grinding. Energy is expended; work is done. Energy has both quantitative and qualitative, or formal, aspects. Quantitatively, energy is measurable in terms of definite and standard units, such as ergs, calories, British thermal units, etc. One magnitude of energy may therefore be compared with another. Qualitatively, energy is manifested in a great variety of forms: atomic, molecular, stellar, galactic, cellular, and metazoan, as well as cultural. From the standpoint of cultural systems, solar radiation, plants, animals, wind, water in

motion, fuels of various kinds, molecules, and atoms are significant forms of energy, significant because it is in these forms that they are, or may be, incorporated into cultural systems. It is understood, of course, that energy is neither created nor destroyed; it is merely transformed. Cultural systems operate, therefore, only by harnessing energy in one form or another, and by transforming it in the production of human need-serving goods and services.

Cultural systems vary as means of harnessing energy; some are more effective than others. They may be compared in terms of coefficients derived by relating amount of energy harnessed and expended in a given period of time to the number of human beings embraced by the system. Thus one cultural system may harness and use x units of energy per capita per year,[4] another, $3x$, or $10x$. The significance of this coefficient lies, of course, in the relationship between amount of energy harnessed, on the one hand, and the number of human beings whose needs are to be served, on the other. The individual human being thus constitutes the unit in terms of which human need is measured and serves, therefore, as the constant against which varying quantities of energy are measured. Thus, we can compare cultures in terms of amount of energy harnessed and expended per capita per year. Or we can make our comparisons in terms of *power*, the rate of doing work, and classify cultures in terms of horsepower per capita.

The source of energy with which cultural systems were activated at the very beginning of man-and-culture history was, of course, the human organism. The energy with which tools, beliefs, customs, rituals, and sentiments were first organized into a functioning system was derived from man himself; he was, so to speak, the power plant that supplied the first cultural systems with their motive power. The amount of energy derivable by a cultural system from this source is of course small. An average adult man is capable of generating about one-tenth of one horsepower, or 75 watts. But the power coefficient of a cultural system deriving all its energy from human organisms would not be 0.1 horsepower per capita, by any means. When everyone is considered, males and females of all ages from helpless infants to the old and feeble, the sick and crippled, the average would be much less, possibly no more than 0.05 horsepower per capita.[5] Since the amount of human need-serving goods and services produced is proportional to the amount of energy harnessed, or horsepower generated, per capita, other factors remaining constant, a cultural system activated by energy derived from the human organism alone would represent the minimum in the range of capacities of cultural systems. From the standpoint, then, both of energy, or power, per capita and amount of human need-serving goods and services produced per capita, cultures that have the energy of human organisms only, under their control and at their disposal for use in the service of human needs, are at the bottom of the scale.

There is room for variation among cultural systems activated by human energy alone. In our formula $E \times T \rightarrow P$, E, the energy factor, may vary with daily calorie consumption. T, the tool factor, varies with degrees of efficiency. Quite apart from natural habitat, therefore, which varies from tribe to tribe and from place to place, we are confronted with variation of cultural systems. Amount of energy harnessed per capita per year is the basic factor in this situation; the other two are meaningless or non-existent without it. Without energy, tools would be meaningless, no work would

be done, no product brought forth. The energy factor provides us, therefore, with an objective and meaningful yardstick with which to measure these, and all other, cultures. A culture is high or low depending upon the amount of energy harnessed per capita per year. At bottom, then, cultural development is the process of increasing the amount of energy harnessed and put to work per capita per year, together with all the consequences attendant upon this increase.

Animal husbandry and agriculture are alike, therefore, in being means of extending control over the forces of nature and of advancing culture as a consequence. But these arts are not equal in their potential capacities for culture building; agriculture has a much greater capacity for culture building than has animal husbandry. The difference in their respective capacities rests upon a simple zoological fact: herds and flocks must feed upon plants; cultivated plants harness solar energy directly. A pastoral system, for all its control over animals, still rests upon a wild-food basis in the last analysis: the plants upon which the herds or flocks feed. The growth and abundance of these plants lie outside cultural control. If pasturage fails, the herds diminish or die. Control over forces of nature is greater and more immediate in agriculture. Plants harness solar energy directly. Fields may be fertilized, excess water drawn off, crops irrigated, advantages derived from use of hotbeds, and so on. It goes without saying that the control exercised through agriculture, though greater than that in animal husbandry, is never complete and perfect; the farmer is of course never wholly immune from natural disaster. But the extent to which culture can develop on a pastoral basis is limited, theoretically and practically. It cannot develop beyond the limit set by the natural production of pasturage. Attempts to increase herds beyond this point merely produce the opposite effect: a diminution of herds as a result of deterioration of pasture caused by overgrazing. In the agricultural arts, on the other hand, there may be a limit to the extent to which human need-serving goods can be produced per unit of human labor, but this limit has not been reached even to this day. Indeed, we seem not to be close enough to it yet even to foresee it and to distinguish its characteristics.

It should be kept in mind that in our discussion thus far, we have been concerned with only one aspect of these processes, namely, the energy factor. We have not dealt with the tool factor at all so far, and we have ignored environment completely. It is obvious that every culture is determined by instrumental and environmental factors as well as by that of energy, but it is convenient and desirable to treat each one singly while disregarding the other two. In considering the culture process, we may think of any two of these factors as constants while we vary the third. Culture will vary, therefore, as the variable determinant varies. Thus, in the formula $E \times T \times V \rightarrow P$, in which E, T, and P have values as before and V stands for environment, we may hold any two of the three determining factors constant and vary the third. P, the total product, or degree of cultural development, will then vary accordingly. The status, or degree of development, of any actual cultural system will, however, be determined by all three factors working together.

Environment. Every cultural system exists and functions in a natural habitat, a collocation of flora, fauna, topography, altitude, meteorologic conditions and forces, and so on. And every culture is of course affected by these environmental factors. But the

relationship between culture and environment is not a one-to-one correlation by any means. Environment does not "determine" culture in the sense that "given the environment we can predict the culture."[6] Environments vary, and their influence and effect upon cultures vary likewise. Some habitats are suitable for agriculture, a pastoral economy, or fishing, manufacturing, etc.; others are not; they may even render certain types of cultural adjustment to nature impossible. But the relationship of culture to environment is determined to a very great extent by the degree of cultural development. The region now known as Kansas was not suitable for agriculture for a people with a culture like that of the Dakota Indians in A.D. 1800. The same region is not suited to a hunting economy now. Whether the coal and iron deposits, or the water-power resources of a region will be exploited or not depends upon the degree of development of the culture of that region. This observation helps to make explicit and apparent an important generalization about the relationship between culture and environment: features of the natural habitat become significant only when and as they are introduced into cultural systems and become incorporated in them as cultural elements. The coal and iron of western Europe, or the water power of England, become significant only at certain levels of cultural development. The flowing streams of England were relatively insignificant culturally in A.D. 1200; they became tremendously important as sources of power for industry in the seventeenth and eighteenth centuries; with the development of the steam engine and the exploitation of coal resources, they became relatively insignificant again. Thus we see that although natural habitat exerts an influence upon culture, we can learn more about this influence from a consideration of the culture and its degree of development than by a mere inventory of environmental features.

The Role of Tools. The technological process may be analyzed, as we have noted earlier, into two components or aspects. On the one hand, we have energy, harnessed and expended, and on the other, the mechanical means with which this is accomplished. A woman digs edible roots with a stick; a man shoots a deer with an arrow; corn is ground with a metate or a water mill; an ox draws a plow. Having sketched the course of technological development from the standpoint of energy, we now turn to the aspect of tool, or instrumental, means.

As Ostwald has pointed out, the structure, use, and development of tools may be illuminated by thinking of them in their relationship to energy. "When a man took a staff in his hand," he says, "he increased the radius of his muscular energy … and was therefore able to apply it more usefully. By the use of a club he could accumulate his muscular energy in the form of kinetic energy and bring it into play with sudden force when the club alighted. By this means it was possible to perform work which could not have been accomplished by the unaided activity of his muscular energy in the form of pressure. …"[7]

In the bow and arrow, muscular energy is transformed into form energy of the drawn bow, from which it may be released instantaneously and with great intensity. In the crossbow, muscular energy can be stored up indefinitely.

There is an aspect of economy as well as of mechanical efficiency to be considered in evaluating the role of instrumental means of controlling energy. One type of tool

may be more economical though no more efficient, or even less efficient, than another. *Economy* is here measured in units of energy required for the production of the tool. Early copper axes or knives were little, if any more, efficient than the stone implements they replaced, according to Childe.[8] But if a stone ax were broken, it would be difficult, if not impossible, to repair it so that another would have to be manufactured to replace it. The copper axe, on the other hand, could be repaired with relative ease. The cost in labor of the stone implement was much greater than that of metal, and so the latter would be preferred at equal degrees of efficiency. The same principle will apply to higher levels of technological development.

We may summarize our discussion of energy and tools in the following law of cultural development: *culture advances as the amount of energy harnessed per capita per year increases, or as the efficiency or economy of the means of controlling energy is increased, or both.*[9] Progress was due almost wholly to increase of efficiency or economy of mechanical means in the first stage of cultural development. In subsequent eras development has come from both sources.

It must not be assumed, however, that these two factors, energy and mechanical means, are equally significant merely because both play a part in cultural evolution and progress. The energy factor is much more fundamental and important. The fact that energy is of no significance as a culture builder without mechanical means of expression in no way invalidates this evaluation. If energy is useless without mechanical contrivances, the latter are dead without energy. Furthermore, no amount of addition to, or improvement of, mechanical means can advance culture beyond a certain point so long as the energy factor remains unchanged. Culture would retrogress, even if its tools and machines were perfect—and precisely because they were perfect—if the amount of energy harnessed per capita per year were diminished. On the other hand, an increase in amount of energy harnessed will not only carry culture forward because of this increase but will foster mechanical improvement as well. Mechanical instruments are indeed essential. But they are merely the vehicle, the means, the scaffolding, the skeleton; energy is the dynamic, living force that animates cultural systems and develops them to higher levels and forms.

NOTES

1. We define *sociocultural system* as the culture possessed by any distinguishable group of people.

2. David Burns, Grieve Lecturer on Physiological Chemistry at the University of Glasgow, reports on experiments in which the amounts of energy to give lectures were measured, the measurements being expressed in mathematical terms. See *An Introduction to Biophysics*, 1921, p. 329.

3. Frederick Soddy, *Matter and Energy*, Oxford University Press, London, 1912, p. 25.

4. When we deal with cultures in terms of magnitudes of energy harnessed and put to work we must specify the period of time during which this takes place, since magnitude varies with length of time. We select a year as our unit of time because, in addition to being convenient and easy to work with, it embraces a complete cycle of the seasons, and hence the whole gamut

of the routine activities of any cultural system. If, however, we deal with cultures in terms of horsepower, no time period need be specified since horsepower is the rate of doing work.

5. The amount of energy that the human organism is capable of producing will depend largely upon the food-energy intake. Naturally we do not have figures for the diet of primordial man, nor even adequate data for present-day preliterate peoples. We do, however, have statistics for modern nations. The range within which the amount of food energy consumed per capita per diem varies is interesting and significant, especially with respect to animal proteins:

Daily Food Supply per Capita

	All foods (calories)	Percentage of United States	Animal proteins (ounces)	Percentage of United States
United States	3,098	100	1.8	100
Sweden	3,171	100.2	2.2	122
Japan	2,230	72	0.4	22
China	2,234	72	0.2	11
India	1,976	64	0.3	17
Mexico	1,855	60	0.7	40

SOURCE: *Point Four*, a mimeographed publication of the U.S. Department of State, 1949, p. 109.

6. "While it is true that cultures are rooted in nature, and can therefore never be completely understood except with reference to that piece of nature in which they occur, they are no more produced by that nature than a plant is produced or caused by the soil in which it is rooted. The immediate causes of cultural phenomena are other cultural phenomena. …" A. L. Kroeber, "Cultural and Natural Areas of North America," *University of California Publications in American Archaeology and Ethnology*, 1939, p. 1.

7. Wilhelm Ostwald, "The Modern Theory of Energetics," *The Monist*, vol. 17, p. 511, 1907.

8. V. Gordon Childe, *What Happened in History*, 1946, p. 69.

9. "… Progress of technical science is characterized by the fact: first, that more and more energy is utilized for human purposes, and secondly, that the transformation of the raw energies into useful forms of energy is attended by ever-increasing efficiency." Ostwald, op. cit. Ostwald is here speaking of technical science. But if cultural development as a whole rests upon and is determined by technological advance, what he says here would apply to the evolution of culture in its entirety.

Chapter Fourteen

The Growth of World Urbanism

Charles Redman

One of the dominant trends in world history during the past 5000 years has been the emergence, spread, and continued growth of aggregations of people to the point that in modern times, each decade sees a larger majority of people living in cities worldwide. With an increasing reliance on an expanding food base provided by agrarian innovations and improvements in the transport of foodstuffs, it became possible for larger and larger numbers of people to exist and to live in nucleated locations. This process occurred at different times in each part of the world, but there is good archaeological evidence for what we are willing to call cities in at least Mesopotamia by 3000 B.C. and soon thereafter in many other parts of the Old World.

The emergence of urban society introduced a whole new set of human-environmental interactions. One set of impacts derives from the fact that there were just more people in the world, requiring greater food production. A second impact is the increased need for building materials—wood, stone, and fired bricks—to construct these cities. A third impact is the territory itself that is given over to settlement, creating urban ecosystems. A fourth impact is really a series of newly established interactions caused by the nature of urban society with its industry, trade, and hierarchical administration. Just as settled village life allowed people to invest their labor in permanent facilities and to accumulate more goods, urban life advanced those processes to new levels. The creation and concentration of goods and the productive capacity to create more became the hallmark of urban society. All of this took a heavy toll on the environment and solidified a new set of relationships between humans and their environment.

The increased demands put on local environments by growing urban populations were partly mitigated by the greater labor invested by these people to transform their landscapes to sustain a higher level of production. Among the many efforts employed to increase productivity, irrigation of bottomlands and enhancing hill slopes through terracing are two of the most fundamental innovations of humankind. Redistributing available surface water through the construction of irrigation canals made agriculture practical in many otherwise unsuitable regions and often increased the productivity of those and other regions several-fold. The construction of irrigation works was

limited to favorable geographic settings where potential farmlands were relatively flat and the river or other sources of water were elevated sufficiently above the fields to allow for gravity to carry the water through the newly dug canals. Other, more complex water-management techniques were also used, such as underground canals (quanats, see English 1966; Schreiber and Rojas 1988), or raised fields (chinampas, Coe 1964).

Irrigation must have started on a small scale with rather simple constructions, but as its value became apparent, more effort was invested in new construction to divert more water into the canals and to extend the canal system to reach greater areas of potential farmland. Because of changing water levels and clogging by waterborne silt, canals and their intakes required substantial additional labor to maintain, in addition to the normal labor required to guide water from field to field. Beyond this, some personnel had to be devoted to making decisions about the allocation of available water among the users and insuring that these directives were carried out. With irrigation water also came potential problems, the most obvious being the susceptibility of low-lying farmlands to disastrous flooding and the longer-term problem of salinization. To combat flooding from rivers that had agraded above the level of the surrounding fields, people from early historic times until today have constructed protective levees between the river and the settlement or fields to be protected. This, of course, is effective up to a certain level of flooding, but changes the basic hydrology of the area and can multiply the damage when the flood level exceeds the height of the levee.

Salinization is caused by an accumulation of salt in the soil near its surface. This salt was carried by river water from the sedimentary rocks in the mountains and deposited on the Mesopotamian fields during natural flooding or purposeful irrigation. Evaporation of water sitting on the surface in hot climates is rapid, concentrating the salts in the remaining water that infiltrates through the soil to the underlying water table. Conditions of excessive irrigation bring the water table up to within 18 inches, where capillary action brings it to the root zone and even to the surface, where the high concentration of salts would kill most plants.

Solutions for salinization were not as straightforward as for flooding, but even in ancient times it was understood that the deleterious effects of salinization could be minimized by leaching the fields with additional water, digging deep wells to lower the water table, or instituting a system of leaving the fields fallow (Adams 1978). The first two cures required considerable labor and the third solution led to a diminished productivity, not often viewed as a likely decision in periods of growing population. An effective irrigation system laid the foundation for many of the world's early civilizations, but it also required a great deal of labor input and often favored societies that were centrally controlled.

Another major option available to growing agrarian societies to meet their food-producing needs is to expand the land under cultivation, which often means to farm less-desirable hill slopes surrounding the favored low-lying valley bottoms. Since bringing irrigation water to a hill slope is usually impractical, the key is effective utilization of rainfall. Rainfall either soaks into the soil or runs off of it led by gravity. A soil that is deep, well-structured, and covered by protective vegetation and a mulch of plant residues will normally absorb almost all of the rain that falls on it, given that the slope is not too steep (Hillel 1991:97). However, soils that have lost their vegetative

cover and surface mulch will absorb much less, with almost half the water being carried away by runoff in more extreme situations. This runoff carries with it topsoil particles, nutrients, and humus that are concentrated in the topsoil. The loss of this material reduces the thickness of the rooting zone and its capacity to absorb moisture for crop needs. Sufficiently violent runoff erodes away the soil until bedrock is exposed, leaving only protected patches of soil and diminishing the overall productive potential of the landscape. This erosion may in turn have a deleterious effect on the lowlands that receive this runoff, often clogging waterways and burying productive soils below sediment of coarser material. Hence, for growing urban populations to expand their farming endeavors to the surrounding hill slopes, they had to devise ways to impede runoff and maintain the depth and fertility of the soil.

The most direct solution to this problem of slope runoff was to lay lines of stones along the contours of the slope and hence, perpendicular to the probable flow of water and sediment. These stones would then act as small dams, slowing the downhill flow of water and allowing more water to infiltrate and soil particles to collect behind the dam. The success of this type of approach led to its use in many different circumstances and societies. Among many early civilizations, including those of the eastern Mediterranean, elaborate constructions we refer to as terraces were an essential element of their agricultural systems. They were widespread in the Levant as early as the second millennium B.C. and at least in a simplified form they were probably employed millennia earlier (Simmons 1989).

The objective of building terraces was to transform sloping ground into a series of nearly horizontal arable plots with adequate control of water runoff and minimal erosion of the soil. When these terraces were constructed, the natural patterns of drainage were altered, as was the development of soil behind the terrace walls. Overall, the impact of well-planned terracing was to allow farming in otherwise unusable areas and to increase the sustainability of plots that already were in use. The costs, however, were great both in terms of labor for initial construction and for the continual maintenance needed to keep the walls intact.

Mesopotamia

It was a study conducted in the Near East that first demonstrated the value of archaeology in understanding human impacts on the environment and possible methods to ameliorate these problems. In 1958 Thorkild Jacobsen and Robert McC. Adams published an article in *Science* that spoke directly to the problems caused by salinization of farmlands in lower Mesopotamia 4000 years ago and what modern inhabitants of that region might learn from the past (Jacobsen and Adams 1958). Over the years since 1958, sporadic papers have continued to appear on this subject (Gibson 1974; Gelburd 1985; Dickson 1987; Redman 1992), and salinization is often expressed in textbooks (Redman 1978; Nissen 1988) as a major problem leading to the reduced political importance of southern Mesopotamia, even though there remains considerable debate (Powell 1985) over the cultural context that led to this environmental "catastrophe."

The case study focused on here is that of the Ur III Dynasty of southern Mesopotamia. Information on this is gleaned from the original Jacobsen and Adams article (1958) as well as subsequent pieces by each of them (Jacobsen 1982; Adams 1978). There remains some controversy over whether the changes cited were as grave as suggested or whether these causes were in fact at fault. The use of early textual accounts and incomplete archaeological investigations often leave the most interesting interpretive models as hypotheses rather than confirmed facts. If we were to avoid these still tentative reconstructions because of their uncertainty we, as archaeologists, would be ignoring what might become our greatest contribution to modern society. Whether or not subsequent studies show that this view of the Ur III situation holds true, it is likely that other Near Eastern civilizations experienced similar cycles of political and economic growth followed by environmental and subsequent social decline, both before Ur III (as suggested by H. Nissen, personal communication) and after it (Adams 1978).

Four thousand years ago, the Ur III Dynasty was situated in the southern half of Mesopotamia, and consisted of numerous cities, each inhabited by several tens of thousands of people and supported by an associated hinterland of farms and villages. This was one of the great early societies of Mesopotamia with well-developed writing, a system of laws, extensive trade networks, and ambitious builders, and it was a period of strong centralized political control (Edzard 1967; Nissen 1988). The economic system relied heavily on irrigation agriculture with vast field systems along the Euphrates River and canals leading from it. Winter-cultivated cereals were the main crops, although there were many secondary crops. Herding was also important, with contemporary records indicating as many as two million sheep were being kept.

The aspect of Ur III society emphasized here is the rapid rise in the centralized control of the political hierarchy and paradoxically how that contributed to an era of declining agricultural productivity and environmental damage. Centralized control of the once independent city-states was a logical objective of the growing power of the Ur III rulers. Centralization gave them greater access to labor pools, military conscripts, trade goods, and agricultural produce. More telling from our perspective, centralized control increased the potential for the production of food and other goods. Some of this increased productivity was achieved through increased specialization of production, but the majority resulted from centralized management of the construction and maintenance of water works and the allocation of water in the growing irrigation network that fed the Mesopotamian fields. Moreover, it was a logical decision for Ur III rulers to extend the land served by irrigation and to increase the capacity of the existing canal system so more water could be brought to the fields. This would allow more water to be used, particularly in flood years. Another decision that would have seemed logical under pressure to produce more, would be to shorten the period of time fields were left fallow. But the same decisions that brought short-term increases in production, as evidenced in the high population density and great construction projects of the Ur III period, rapidly undermined the agrarian base and led to a long period of diminished productivity. The major villain was salinization of the soils. Although there is general agreement that salinization was, as Hans Nissen says, "one of the greatest countrywide catastrophes," there remains considerable debate over the causes.

Written records of temple storehouses of the period allow scholars to reconstruct with some certainty the relative productivity of fields and the crops being planted. A long-term decrease in productivity occurred between 2400 and 1700 B.C. At the outset of this period, wheat was an important crop, accounting for at least one-sixth of the cereals produced. But as salinization increased, people slowly shifted to the more salt-tolerant barley, so that by the end of the Ur III Dynasty in 2000 B.C., wheat made up only one-fiftieth and by 1700 B.C., it appears that wheat was totally abandoned in the region (Jacobsen 1982). The end of this decline in wheat production coincides with a long period during which centralized political control had broken down. Many cities were abandoned or reduced to villages, and the emphasis in agriculture shifted. Whereas during the height of Ur III control maximizing surplus production for central rulers dominated, during the subsequent political breakdown, the object became satisfying the needs of local populations in a more self-sufficient localized production mode.

The evidence from the uplands surrounding Mesopotamia that is only beginning to be collected by a couple of projects has provided a consistent set of results. Naomi Miller has examined macrobotanical remains from two widely separated sites in upland Iran and Turkey (1992). She found that over time during the second and third millennia fuel wood was brought into the settlements from farther and farther away. There was also a shift to a greater reliance on dung over wood as a source of fuel. Both patterns indicate that forests were being clear-cut in the vicinity of the settlements. As was suggested for the vicinity of Ain Ghazal, domestic needs, goat browsing, and field clearance would essentially deforest the immediate vicinity of the villages, while lime production and charcoal making would consume additional quantities of wood, probably cut at a location farther from the settlement. This would extend the effective area of deforestation even more.

Another study, this time of pollen taken from a core from the bottom of a lake in south central Anatolia, reveals a more broadly regional pattern of vegetative change over the past 10,000 years. During the last Ice Age, the region was a glacial, steppe environment with few trees and mainly grasses (characterized as *cheno-artemisia*). During the early Holocene (ca. 9000 B.P.), when the first farming villages would have been established, the region hosted a mixed forest of oak, pine, and juniper. By the mid-Holocene (ca. 3000 B.P.) the oak in the forests was drastically reduced; pine, whose pollen can travel great distances, continued; and cereal grasses increased. Recent pollen evidence is dominated by pine pollen that is traveling from mountainous refuge areas and a modest occurrence of cereals, reflecting the reduction in agriculture in the region.

The traditional lore today in the Near East to explain deforestation and localized failures of farming blames it on the Ottoman Rule of the region during the last few centuries. It is said that the denuded lands are largely the result of overgrazing of goats during the period of Ottoman Rule and that in ancient times these were the lands of "milk and honey." This assertion is probably true to some extent in that the Ottoman political system discouraged local infrastructure development and encouraged small-scale social groups that would rely on herded animals. However, this interpretation is an oversimplification that takes our attention away from the needs of the

domestic hearth and industrial kiln from as far back as the earliest civilizations 5000 years ago. The goat is the most destructive of the grazers, but its effects are largely secondary; that is, it usually is not the one to destroy the trees themselves, but only the shoots, leaves, and young sprouts. This does diminish the primary production of the trees as well as keep young trees from reestablishing themselves. Thus, goats are strong contributors to keeping an area from regenerating trees and ground cover and consequently exposing it to the elements and leading to degradation of the fertility of the topsoil and, ultimately, to complete loss from erosion. Complementing these pressures is the hearth and kiln that need not just twigs and thin branches, but timber as well. The heavy weight of wood also dictates that when possible, people will completely denude local sources, rather than draw on larger, more distant sources in an effort to conserve forest growth. The importance of securing fuel for the domestic hearth continues to this day to force the gathering of forage from great distances.

Mexico and Central America

Mexico and Central America were home to a wide variety of impressive prehistoric societies. The Maya to the south and a variety of Central Mexican societies to the north each built strong agrarian systems that supported very high populations and elaborate urban centers (Coe 1982). The main New World crop in North, Central, and South America was corn. First domesticated about 5000 B.C., or somewhat earlier, corn started out as a very small cob, not economically viable as the dominant food source. This differs from Old World species like wheat that were nearly as productive in the wild as under early cultivation. Early forms of corn were pioneering weeds basically used by Central Americans as a back up or famine food. However, over a long period of low-level use, the nature of corn changed, with larger cobs and kernels being selected for by the early users. It took three or four millennia of slowly increasing the size of the cob, the number of kernel rows, and the size of individual kernels before corn as a crop became so productive that people could depend on it as their primary food. With this change, somewhere around 2000 to 1000 B.C., it became practical to invest the labor to clear fields and to establish year-round villages that could rely on corn harvests and stored corn for their primary subsistence. During this same period other crops were also experimented with and ultimately domesticated by New World groups. Gourds, squash, and beans are among the most important, but altogether more than forty species of economic plants were domesticated in the New World.

Once well-developed, corn and other New World domesticates offered people an abundant source of food leading to increasing population and social advance. The Maya of Central America were among the most innovative people of the Americas, having many accomplishments in the arts, science, and human organization. Well before the beginning of the Christian era, the Maya and their associates had built enormous ceremonial and administrative centers throughout their lands and developed into a tightly controlled society that thoroughly settled the landscape between centers with scattered farming households and hamlets. The geography of the Mayan

homelands did not lend itself to centralized irrigation works, but rather was most suitable for extensive fields of slash-and-burn (milpa) agriculture. This ensured that the agrarian population would have to remain scattered to be close to their fields and that a maximum amount of land would have to be under tillage to support the growing population. In fact, as many as 8 to 10 million people lived in the Mayan domains 1000 years ago, a figure not surpassed until the recent decades of this century.

The Mayan homelands of the Yucatán, Belize, Guatemala, and parts of Honduras were well watered and primarily lowlands. The upland zone, focused in Guatemala, had relatively well-drained soils that were favorable to maize agriculture, especially in the valley bottoms. The Mayan lowlands were characterized by less well-drained soils in an environment of flatlands with scattered lakes. Classic Mayan civilization, best known for its ceremonial centers with earth-filled pyramids topped with carefully ornamented temples, was well established by A.D. 300. The construction and decoration with stucco relief of pyramids and temples absorbed tremendous amounts of Mayan labor and resources. These centers were the focus of religious activities, trade relations, and whatever political integration existed at the time. The Maya were remarkable astronomers and regulated religious events with a sacred calendar that was calibrated by an extremely accurate secular calendar. Public ceremonies utilizing the temples, pyramids, and ritual ball courts demonstrated the power of the elite, as did the rising tide of militarism. Despite their many talents, the zenith of Mayan ceremonial centers and the organized society they represented was not especially long lived. By A.D. 900 to 1000 there is widespread archaeological evidence for the abandonment of most of the major centers and an overall drop in the population of the region. Clearly there is a breakdown in the political and social organization that had led the Maya to such impressive accomplishments. Various theories have been put forward as to the cause of this "collapse." Primary among them is that degradation of the environment through excessive agricultural practices played a major role (see Culbert 1973). Archaeologists are beginning to accumulate evidence to evaluate the importance of human impacts.

The Petén region of lowland Guatemala was the subject of a pioneering study of prehistoric human-environmental relations by the Central Petén Historical Ecology Project (CPHEP; see Rice 1996). This project was designed primarily to learn about the genesis and change of the tropical forest, rather than focusing on the prehistory of the Maya. However, the Maya were clearly one of the central agents of environmental transformations, being a "strain" on the natural ecosystem. One of the goals of this study was to delineate changes in the forest ecosystem that could be attributed to climate change versus those resulting from human impact. May to October is the rainy season in the Petén, with 70 to 90 inches per year. A high canopy of mahogany, breadnut, and sapodilla trees dominates the landscape with a middle canopy of avocado and other small trees and shrubs. In temperate regions, such as those we discussed earlier in this volume, forest soils contain most nutrients that sustain plant growth. When a temperate forest is cut down, it is the soil that stores the nutrients until they are utilized by subsequent growth.

In contrast, it is the vegetative cover rather than the soil that holds most of the nutrients in tropical forests, such as those of the Petén (Rice and Rice 1984:8). More than

75% of the nutrients in a tropical forest ecosystem are in the living vegetation and the dead organic matter on the ground, which is rapidly recycled into new growth rather than enriching the soil. Because of this a tropical forest can regenerate almost all of its biomass within a 10-year period, versus up to 100 years in most temperate settings. If the trees and vegetation that are cut are also burned, this recycling is even faster. Hence, a slash-and-burn strategy can transfer the abundant nutrients in the tropical cover to newly planted crops and yield impressive returns. At the same time, slash-and-burn exposes the soil to potential erosion and therefore is best conducted in selected topographic settings and under close management.

We know from historic periods that this region can efficiently support a swidden or milpa agricultural system, where trees are cut from a plot of land before the dry season and burned at the end of the dry season. Then it is used for two years of crops and left fallow for three to six years. This type of rotation has been known in recent times to comfortably support a density of about 25 people per square kilometer. However, archaeological evidence from this region suggests that at certain times and in some locations, the population density attained 250 people per square kilometer (Rice 1996: 196). Obviously, Mayan farming strategies were well developed and closely attuned to the potentials of the environment. Houses were dispersed across the countryside to allow farmers easy access to the maximum amount of arable land. Instead of transforming the entire landscape to increase production, the Maya grew a diversity of crops on the same field and may have focused on the naturally low-lying areas, or *bajos*, with their relatively fertile soils for labor investments such as raised fields. The efficient production and centralization of farm products allowed the growth of enormous ceremonial centers such as Tikal, which thrived from 100 B.C. to A.D. 900. However, even Tikal entered a period of decline in A.D. 800, with the last dated monument being constructed in A.D. 909. The general belief is that the land had been filled up for some period, and with declining fertility, the dense population could not be supported and fell into rapid decline, requiring emigration. Archaeologists estimate that within a few centuries, population had fallen by 80% and most of the formerly majestic ceremonial centers had been abandoned.

As part of the Central Petén Historical Ecology Project, Don and Prudence Rice and Bill Deevey studied several lake basins from a number of perspectives: archaeological settlement patterns, pollen record, erosion of sediment, and chemical loss of soils (Rice and Rice 1984). Their unit of study was the lake and its drainage basin. One can relatively easily define the surface boundaries of each lake basin and then monitor the movement (flux) of nutrients and sediments between the terrestrial and aquatic portions of the system (see Binford and Leyden 1987). Their model views an ecosystem as sustaining itself on the flow of chemical elements drawn by vegetation from rocks, soil, and air, carried either in dissolved or suspended form in water into the lake. The presence of humans increased this flow. Thus a lake basin can be thought of as a *trap* in a closed system, revealing activities that influence the terrestrial components of the catchment basin.

By examining sediment cores taken from lake bottoms, these authors found that the deposition of phosphorous and silica were both amplified over normal levels during the period of Mayan occupation, indicating a significant disturbance of the

surrounding landscape. Phosphorus is rare in the lowlands and is crucial for agrarian success; hence tracing its movement through the environment is a meaningful measure of impact on chemical nutrients. Erosion leads to a permanent loss of phosphorus from the soil, since it is generated very slowly from underlying bedrock. Because of this, in modern times phosphorus is one of the major elements added to soil in the form of chemical fertilizer. It is believed that activities such as burning vegetative cover and constructing stone buildings released large amounts of phosphorus into the soil (Rice and Rice 1984:21). Phosphorus deposited in lake bottoms reflects the active transport through erosion of the chemicals from surrounding topsoil, where it exists both because of natural generation from bedrock as well as from human waste, food products, mortuary, and disintegration of stone building materials. The researchers found that the phosphorus deposition in the lakes increased roughly in a linear relationship with the archaeological evidence of population increase, reflecting probably both more phosphorus in the soil and more erosion of this soil into the lake bed. This loss of a key element, and other components of the topsoil as well, led to a slow, but progressive undermining of the productivity of the lands around the lakes, particularly the uplands that would be most vulnerable to slope wash.

Silica, being a relatively large-grained component of soils, is a reasonable indicator of the rate of transport of soil in a lake basin (Binford and Leyden 1987). It might reflect a variety of landscape-altering activities that would make the soil more susceptible to erosion, such as deforestation, cultivation, and settlement construction. The researchers found that in Lake Sacnab and especially in Lake Yaxha, silica deposition increased several fold during the height of Mayan occupation (Rice, Rice, and Deevey 1985). Despite this evidence of soil erosion and the implied reduced productivity of local lands, the Maya lived here and elsewhere for a long period of time. Clearly the Maya understood the tropical forest ecosystem well enough to maximize the exploitation of the region and to conserve available resources so as to thrive for centuries in most locations. Researchers have suggested that the Maya tried not to completely clear the land and to plant it with diverse crops to maintain fertility and minimize exposure to erosion. They also invested heavily in water control to minimize the destabilizing aspects of water flow while maximizing the flow to fields to increase crop yield per hectare (Rice and Rice 1984:27). And finally they organized themselves to move food around the region, buffering localized risks and allowing for concentrations of population.

The picture that comes together from studies of the Petén and the adjacent Mayan area of the Mexican Yucatán reveals an anthropogenic ecosystem through much of the Holocene. The high forest that prevailed in much of that region was largely removed by the farming and settlement building activities of the Mayas as early as 3000 to 4000 years ago (Islebe et. al. 1996). This resulted in a shift toward more open vegetation during much of the Mayan occupation with the maximum deforestation between 1000 and 2000 years ago. The basic drain on the land of dense population, intensive agricultural manipulation, and construction of massive settlements increased to the point were the system was no longer sustainable. Declining productivity must have had a multiplier effect, leading to food shortfalls, reduced labor investment, and political instability. By the end of the tenth century A.D., most of the large settlements of

the Mayan uplands and southern lowlands had been abandoned or at least seriously depopulated. The deterioration seems to coincide with a relatively dry period that would have also put pressure on productivity, making it difficult to determine whether the primary influence was climatic or human (Hodell, Curtis, and Brenner 1995). Without denying this uncertainty, I believe this "collapse" was primarily due to the extended period of intense human exploitation, albeit aided by microclimate variability.

Similar inferences have been drawn from the large research project focusing on and around the Mayan center of Copán in neighboring Honduras (Abrams and Rue 1988). Based primarily on evidence taken from a pollen core in a local bog, Abrams and Rue see a major era of regional deforestation during the Classic Mayan occupation when the forest was replaced by grasses, and then a regeneration of the forest about A.D. 1300, and finally a disturbance once again during this century. They attribute several important uses for wood products that outstripped the supply as the major cause of deforestation. First, the domestic hearth required a continual supply of fuel; second, the production of lime plaster for houses and monuments required fuel; and third, the construction of homes relied on quantities of timber. All of these demands would be tied directly to the size of the local population as would the need to clear or partially clear lands for agricultural fields. Their conclusion is that the deforestation was basically the result of a growing, dense population, and once that declined in the tenth century A.D., the soil and forest regenerated over time. The forest was not threatened again until the twentieth century, when the population once again soared. An interesting footnote to these two studies, is that the tropical rain forest of Central America is only about 600 years old and has grown on the location of what was a largely anthropogenic, agrarian landscape (Islebe et. al. 1996:270).

Hohokam of Southern Arizona

The Hohokam represent one of the great cultural traditions of the American Southwest. Archaeologists have characterized them by the red paint on buff-colored pottery, the fact that they built platform mounds and ball courts, and their highly efficient irrigation agriculture (Gumerman 1991; Crown and Judge 1991). Their settlements are found along the lowland river valleys in the desert region of central and southern Arizona. Their occupations of parts of this region are very long lived, beginning before the Christian era and lasting until almost A.D. 1400. Some of their settlements were occupied for only a few generations, but in selected locations, such as the basin occupied by the modern city of Phoenix, Hohokam communities were present for a millennium. These were very successful farmers who built impressive irrigation systems; their homeland received only six or eight inches of rain per year, far less than corn requires. The Hohokam supplemented their irrigation crops by gathering plants and hunting game. They also developed a regional trading network that brought them products from the uplands to the north and east. Although the population density of the Phoenix basin ebbed and flowed, the persistence of the Hohokam in that location is truly impressive, and to the Hohokam themselves, their existence must have appeared sustainable forever.

The centerpiece of the Hohokam's success was their irrigation system, which was built around the two rivers—the Salt and the Gila—that traversed the broad Phoenix lowland basin. These rivers ran year-round, but their volume varied enormously in response to runoff from rainfall and snowmelt in their catchments during the spring. When these rivers were in flood, they carried substantial quantities of suspended sediment from the uplands. When the fields were purposely watered or accidentally flooded, they received a load of nutrients and new silt that served to regenerate the soil's fertility. This was extremely important in the Southwest, where soil development was slow and remained shallow. The Hohokam took advantage of this resource by building hundreds of miles of canals, some as long as 30 km, to bring water and sediments to increasingly distant fields. Hohokam settlement focused in the wide valley bottoms of the Salt, the Gila, and their tributaries. However, they also utilized the sloping uplands, the bases of alluvial fans, and the arroyo bottoms, where storm runoff could be channeled and would bring major organic and sediment additions to the desert soils.

Other aspects of the Hohokam's food-producing strategy were designed for enhancing productivity and maintaining sustainability. Use of surface water was essential for Hohokam survival, and sources of this water in the desert Southwest were extremely localized. Moreover, locations suitable for water diversion or canal headings in association with downstream flatlands for farming were even more restricted. This made it very disadvantageous for a settlement to move frequently. In addition, the major labor invested in constructing canals and runoff gathering features, and the fact that population was increasing and filling up alternative locations, made it very important for Hohokam settlers to conserve the long-term productive potential of their immediate surroundings. The fact that intensive agriculture results in reduced mobility options for human groups is key to understanding the human-environmental interactions of the Hohokam and many other groups around the world.

The removal of ground cover plant material was mediated by the fact that the Hohokam were "direct gatherers"; that is, they consumed what they gathered rather than depending on domestic animals that consumed the plant material. This meant that a wide range of plants not eaten by humans that might be consumed by domesticates would be spared. It also meant that when humans did consume wild plant material, they often focused on the seeds or fruits, leaving the plant intact. This, combined with the fact that the Hohokam homeland had a relatively warm climate (minimizing the need for fuel to heat their homes), meant that the vegetative ground cover was favored. Potential sources of fuel, such as mesquite trees, were also spared because they produced seedpods that were important sources of food. Wood for fuel and for construction would have had to come from elsewhere. Also, transplanted desert species supplemented the corn, beans, and squash that spread from Mexico. Local varieties of beans were grown, agave was harvested for food and fiber, and other crops like cotton and little barley also contributed. Animals hunted were usually small and found in the vicinity of settlements, such as rabbits. Trapping them may have been a regular part of the daily farming regime. Large artiodactyls, like antelope and deer, were hunted when available, but over time it appears that long-distance hunting parties were needed to bring back these animals, implying that they were no longer available

locally. Also over time, the shift in type of rabbits eaten (from cottontail to jackrabbit) reflects increasingly open habitats. Both of these processes show that despite the conservation efforts of the Hohokam, their presence in high numbers took its toll on the natural vegetation.

Archaeological evidence reveals that there was a dramatic increase in riparian species consumed during the Classic period (ca. A.D. 1250–1400), a time by which the other terrestrial fauna would be depressed in the vicinity of settlements. Although the overall climate and environment of central Arizona has not changed significantly since Hohokam times, the riverine eco-system along the Salt and Gila Rivers has changed dramatically as a result of human-induced alterations, primarily during the past century. In prehistoric times the rivers would have had some water year-round, and they would have flowed actively for substantial periods of time. There would have been lakes and swamps along the river courses, and the riparian areas would probably have been lush and large. Nevertheless, the use of muskrat, beaver, birds, and fish implies a food crisis for the Hohokam. Fish ranked second behind rabbits as a source of animal protein for the Classic period Hohokam (James 1994). In measuring the size of the fish taken during Classic Hohokam times, Steven James found that they were smaller than the modern examples, suggesting to him that already these fish were under pressure and the larger ones had been fished out, leaving only relatively small fish to be caught. James' overall point is that long-term, dense occupation of the Salt-Gila River Valleys by the Hohokam led to the impoverishment of large game in the region, forcing them to use less desirable small game as a source of protein. It even led to the degradation in the river fish available. But this was probably not enough to lead to the abandonment of the region by A.D. 1400.

The Hohokam developed important social institutions to help overcome the difficulties in their environment. As the number of Hohokam settlements grew in an area, they developed coherent groupings we call the Hohokam "community." In the denser situations, this resulted in large central sites with public architecture, such as a ball court and/or platform mound that would be the focus of ceremonial and civic activities. Small settlements, and even distant, part-time hamlets, were involved in the success of these "communities" by being located nearer the agricultural fields and wild food collecting stations. Community organization provided the framework for allocating water from canals and mobilizing labor for construction and maintenance of the canal system.

In sum, the Hohokam developed a distinctively enduring settlement system that outlasted most of their southwestern and North American neighbors. Renewal of fields through waterborne additives permitted a seemingly sustainable agriculture. The yield of domestic crops was supplemented by tended and weedy indigenous species. Because settlements were localized along watercourses, the large surrounding expanses were left uninhabited, allowing for the continued growth of wild vegetation for fuel, craft materials, and edible wild resources. Added to these procurement strategies was an overarching social organization that acted to spread agricultural risks over a sufficient number of environmental zones and allowed for temporary shortfalls that would be buffered through social connections. An example of this relationship is the fact that agricultural fields in the uplands would benefit from a year of heavy

rainfall that might cause destructive floods in the lowland fields. This is clearly a lesson in human organization that adjusted to the requirements of its environment to survive for what, to its inhabitants, must have seemed like an eternity. Nevertheless, Hohokam society came to an end in the fourteenth century, and it is informative to examine the possible causes.

To suggest a possible set of reasons for the demise of Hohokam society, it is useful to look more closely at the relation of environmental factors, irrigation strategies, and social responses. A study of tree ring variability taken from the upper drainage of the Salt and Gila Rivers provides new insight into this complex set of relationships (Nials, Gregory, and Graybill 1989). The basic assumption of tree ring studies is that trees will grow more (i.e., thicker rings) in wet years and less in dry years. In the lower valleys where the Hohokam irrigation system was centered, this should correlate directly with stream runoff and consequent levels of flooding. Although there may be intervening variables, this assumption seems reasonable, and moreover, it provides archaeologists with a useable surrogate measure of annual environmental cycles, at a level of accuracy we seldom attain for the past.

In the Salt-Gila River Valley, settlement grew as people were able to develop irrigation systems using the river floodwaters to advantage. The rivers themselves probably braided as well as ran in a deep channel. Settlement appears to have been along the channels and the main feeder canals. These feeders and the ultimate distributor canals were located some distance downstream from the initial intakes, making each major canal that took water directly from the river the feeder to an entire system of canals that often stretched for many miles downhill. Communities were located along these feeder canals, and it is hypothesized that because they all depended on maintaining the same source of water, they also were held together as a social or political unit (Abbott 1994).

According to the tree ring records there were some big variations in flood levels before A.D. 800, but after that date for over two centuries (until ca. A.D. 1075), there were relatively consistent water levels. This condition favored the construction of an expanded irrigation system in the lower valley. This climate predictability would have encouraged a period of great growth in population and organization. Archaeological evidence confirms this hypothesis, documenting not only a filling in of the Phoenix basin and other lower river valleys, but also the appearance of settlements well up the tributary rivers that displayed Hohokam characteristics. Archaeologists consider these as potential colonies where materials and goods were exchanged with the central valley settlements.

During the next century and a half (ca. A.D. 1075–1250), tree ring evidence indicates that the variability of floods increased with dramatically higher or lower water levels occurring each 20 years or less. Although this situation is less favorable for growth than the preceding centuries, it is within limits that the Hohokam were able to handle without major disruption to their society. Although droughts must have been hard on these people, if they were spaced years apart and reasonable quantities of corn were stored, they could be weathered without enduring trouble. Floods might have had a more serious impact on the system, because they would likely inundate whatever crops were in the fields and destroy irrigation facilities that would take substantial

labor to replace. Regional trading partners were probably sufficient to get the Hohokam through drought years, and the destructive flood years must have been far enough apart for irrigation works to be reconstructed without discouraging the inhabitants.

In the century following A.D. 1250, the climatic situation appears to have become even more erratic, with floods or droughts coming at least once every 10 years. This put tremendous pressure on the survival of the entire system. Crop production in the valleys was seriously diminished, and labor required to maintain the irrigation works dramatically increased. The reduced surpluses of the valley people led to the dissolution of the regional system, which put increased pressure on the valley residents in bad years. To make up for these shortfalls, it is likely that the valley farmers overplanted in their good fields, extended planting to marginal fields, and cut back on fallow periods. All of these strategies would lead to decreases in soil fertility and subsequent productivity. It might also have led to salinization of the formerly most productive soils in the lower valleys. To increase the fields watered during favorable water years, the canal intakes may have been built larger, but during serious floods this would only increase the destructive force of the flood and require even greater labor to replace. At this same time, there was most likely a transformation of the sociopolitical system that emphasized more centralized control, possibly as a response to the increasing environmental threat to the agricultural system (Abbott 1994).

Over the centuries, the Hohokam had developed a very effective human ecosystem. It centered on an agricultural system that relied on major crop production from an efficient but costly irrigation system, supplemental goods from the immediate area and regional partners, and an organizational structure that managed the parts to maintain stability in the face of a naturally variable climate.

The human presence and agricultural activities of the Hohokam on and around the floodplain also contributed to basic environmental problems. Stream channel entrenchment seems to have occurred more frequently and more severely during late prehistoric times than one would expect from climatic factors alone (Waters 1991:155–156). By clearing vegetation from the floodplain and surrounding slopes (*bajadas*), the Hohokam would have inadvertently increased the volume and velocity of surface runoff. Compacted foot trails, short ditches, and even the canals themselves would have concentrated the runoff and further increased its velocity. Taken together, this would seriously enhance the likelihood of serious soil erosion from the slopes surrounding the valley and siltation of the canals on the valley floor.

The longer the Hohokam existed in the same location, the more pressure they put on floodplain dynamics and on the fertility of the soil, but they maintained it through various conservation methods and by supplementing local food with goods brought in by exchange systems. However, when the climate entered a long period of greater variability, including disastrous flooding, it put an additional pressure on the Hohokam system that could not be easily sustained. Their response was to invest more labor in extracting the maximum from the land, but that made the system even more vulnerable to climatic extremes. The production shortfalls also diminished their ability to maintain their regional trading partners and threatened their local organizational control as well. Energy and resources devoted to ceremonial activities and other

cooperative ventures helped hold the system together for generations, but at a cost. To provide for these activities, the agricultural extraction was continually maximized, which cost enormous labor investments and weakened the underlying resilience of the system. When an infrequent but extreme climatic situation arose, the system now could not recover from it, as it probably would have recovered if it had happened a century or more earlier. Nials, Gregory, and Graybill (1989) believe such an event, or series of events, occurred around A.D. 1350. Two years in succession witnessed the highest flood level they had recorded and were followed immediately by one of the driest years on record. The system, already weakened by a century of disruptions, obviously did not overcome this one-two punch. Archaeological evidence shows very sparse settlement in the valley after that date, and the disappearance of many of the traits we have identified as Hohokam from the record.

Human-Land Relationships in Early Civilizations

The main point of the Mesopotamian and Hohokam examples, and I believe of the Mesoamerican examples as well, is that at least in these preindustrial societies, short-term political stability and economic maximization were only achieved by weakening the capacity of the productive system to react to internal and external challenges, and hence, undermined its long-term survival. Cooperative activities in many contexts may help survival of small-scale systems, but as those cooperative ventures become larger and more formalized, their adaptive potential does not always operate. The archaeologists responsible for the Mesoamerican case studies have not yet suggested the social context of the environmental problems they observed, but I would not be surprised if they paralleled the Mesopotamian and Hohokam situations. State ideologies asserted at that time, as do many today, that everyone's interests were served when the interests of the central rulers were served. Yet, many people may not share the rulers' objectives and all elements of the population may not benefit equally from a particular productive strategy. The issue, therefore, is the effective locus of decision-making within the society, how these decision-makers gain their information, and how they perceive their needs.

   As successful agrarian societies began to develop managerial and hierarchical social systems, they set in motion forces that reshaped the agricultural decision-making process, which in turn guided human impacts on the environment. There were benefits to these changes, but in many cases they appear to have threatened the long-term stability of human-land relationships. Anthropologist Roy Rappaport considers this type of inefficiency in the flow of information a "maladaptation" that exists in many complex societies and often undermines their continued survival (1978). Gifts to religious orders, taxes for political leaders, or even unequal exchange values in a market are all ways a surplus can be culled from the producers for the benefit of the elite. For these types of asymmetrical flows of goods to exist in a society, there must also be a strong ideology that convinces the producers that it is in their benefit, or at least necessary, to provide these goods to the elite. The promulgation of these ideologies helps to hold together complex societies.

A useful framework for the discussion of the Ur III Dynasty and the other case studies in this chapter is to think of long stretches of history as a series of cycles of growth, stability, and decline. The idea of regions and their dominant societies oscillating in a cyclical pattern is not new, having been proposed by the fourteenth century geographer Ibn Khaldun (1967). This pattern can be measured in terms of any number of key variables, such as population, energy consumption, other technological indicators, centralization of political power, changes in social organization, or agricultural productivity of the landscape. It is likely that many of these factors are interrelated through feedback mechanisms that act to limit excessive growth in order to regenerate overdepleted situations; hence, the appearance of cyclical behavior.

It is generally agreed that population level is a key variable in understanding the seriousness of human impacts. This is true for any animal species: if the population grows too large, the readily available resources in their environment are no longer able to support it. What alters this relationship for human groups is that through agricultural technology we have been able to enhance the natural productivity of an environment, and through trade or warfare we have been able to move resources from areas of availability to areas of high demand. The actual population numbers in any particular community or for an entire society reflect a variety of biological and social factors that govern fertility, mortality, and migration. The archaeological and ethnographic records clearly demonstrate that although human populations are biologically capable of growing quite quickly, they equally are able to limit that growth through social and other mechanisms (Cowgill 1975). This produces a situation in which population growth is not seen as an unremitting pressure, but rather as a flexible variable responding to many factors by increasing, remaining stable, or even declining.

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The Anti-Politics Machine
"Development" and Bureaucratic Power in Lesotho

James Ferguson with Larry Lohmann

In the past two decades, Lesotho—a small landlocked nation of about 1.8 million people surrounded by South Africa, with a current Gross National Product (GNP) of US$816 million—has received "development" assistance from 26 different countries, ranging from Australia, Cyprus and Ireland to Switzerland and Taiwan. Seventy-two international agencies and non- and quasi-governmental organizations, including CARE, Ford Foundation, the African Development Bank, the European Economic Community, the Overseas Development Institute, the International Labour Organization and the United Nations Development Programme, have also been actively involved in promoting a range of "development" programmes. In 1979, the country received some $64 million in "official" development "assistance"—about $49 for every man, woman and child in the country. Expatriate consultants and "experts" swarm in the capital city of Maseru, churning out plans, programmes and, most of all, paper, at an astonishing rate.

As in most other countries, the history of "development" projects in Lesotho is one of "almost unremitting failure to achieve their objectives."[1] Nor does the country appear to be of especially great economic or strategic importance. What, then, is this massive and persistent internationalist intervention all about?

Constructing a "Developer's" Lesotho

To "move the money" they have been charged with spending, "development" agencies prefer to opt for standardized "development" packages. It thus suits the agencies to portray developing countries in terms that make them suitable targets for such packages. It is not surprising, therefore, that the "country profiles" on which the agencies base their interventions frequently bear little or no relation to economic and social realities.

In 1975, for example, the World Bank issued a report on Lesotho that was subsequently used to justify a series of major Bank loans to the country. One passage in

the report—describing conditions in Lesotho at the time of its independence from Britain in 1966—encapsulates an image of Lesotho that fits well with the institutional needs of "development" agencies:

> Virtually untouched by modern economic development … Lesotho was, and still is, basically, a traditional subsistence peasant society. But rapid population growth resulting in extreme pressure on the land, deteriorating soil and declining agricultural yields led to a situation in which the country was no longer able to produce enough food for its people. Many able-bodied men were forced from the land in search of means to support their families, but the only employment opportunities [were] in neighbouring South Africa. At present, an estimated 60 per cent of the male labour force is away as migrant workers in South Africa … At independence, there was no economic infrastructure to speak of. Industries were virtually non-existent.[2]

The Invention of "Isolation"

To a scholar of Lesotho, these assertions appear not only incorrect but outlandish. For one thing, the country has not been a "subsistence" society since at least the mid-1800s, having entered the twentieth century as a producer of "wheat, mealies, Kaffir corn [*sic*], wool, mohair, horses and cattle" for the South African market.[3] Nor were the local Basotho people isolated from the market. When they have had surpluses of crops or livestock, the people have always known how to go about selling them in local or regional markets. According to *The Oxford History of South Africa*:

> In 1837 the Sotho of Basutoland … had grain stored for four to eight years: in 1844 white farmers "flocked" to them to buy grain. During 1872 (after the loss of their most fertile land west of the Caledon) the Sotho exported 100,000 *muids* [185-lb bags] of grain … and in 1877 when the demand for grain on the diamond fields had fallen, "large quantities" were held by producers and shopkeepers in Basutoland.[4]

Livestock auctions, meanwhile, have been held throughout the country since at least the 1950s, and animals from central Lesotho have been sold by the Basotho as far afield as South Africa for as long as anyone can remember. Far from being "untouched" by modern "development" at the time of independence, colonial rule had established a modern administration, airports, roads, schools, hospitals and markets for Western commodities.

The decline in agricultural surpluses, moreover, is neither recent nor, as the Bank suggests, due to "isolation" from the cash economy. More significant is the loss by the Basotho of most of their best agricultural land to encroaching Dutch settlers during a series of wars between 1840 and 1869. Nor is migration a recent response of a pristine and static "traditional" economy to "population pressure." As H. Ashton, the most eminent Western ethnographer of the Basuto, noted in 1952, "labour migration is … nearly as old as the Basuto's contact with Europeans"[5]—indeed, throughout the colonial period to the present, Lesotho has served as a labour reservoir exporting wage workers to South African mines, farms and industry.

Lesotho Reality

In fact, far from being the "traditional subsistence peasant society" described by the Bank, Lesotho comprises today what one writer describes as "a rural proletariat which scratches about on the land."[6]

Whilst the World Bank claims that "agriculture provides a livelihood for 85 per cent of the people,"[7] the reality is that something in the order of 70 per cent of average rural household income is derived from wage labour in South Africa, while only six per cent comes from domestic crop production.[8] Similar myth-making pervades a joint FAO/World Bank report from 1975, which solemnly states that "about 70 per cent of [Lesotho's] GNP comes from the sale of pastoral products, mainly wool and mohair." A more conventional figure would be two or three per cent.[9]

Also false is the "development" literature's picture of Lesotho as a self-contained geographical entity whose relation with South Africa (its "rich neighbour") is one of accidental geographic juxtaposition rather than structural economic integration or political subordination, and whose poverty can be explained largely by the dearth of natural resources within its boundaries, together with the incompleteness with which they have been "developed." If the country is resource-poor, this is because most of the good Sotho land was taken by South Africa. Saying, as USAID does in a 1978 report, that "poverty in Lesotho is primarily resource-related" is like saying that the South Bronx of New York City is poor because of its lack of natural resources and the fact that it contains more people than its land base can support.

Rearranging Reality

A representation which acknowledged the extent of Lesotho's long-standing involvement in the "modern" capitalist economy of Southern Africa, however, would not provide a convincing justification for the "development" agencies to "introduce" roads, markets and credit. It would provide no grounds for believing that such "innovations" could bring about the "transformation" to a "developed," "modern" economy which would enable Lesotho's agricultural production to catch up with its burgeoning population and cut labour migration. Indeed, such a representation would tend to suggest that such measures for "opening up" the country and exposing it to the "cash economy" would have little impact, since Lesotho has not been isolated from the world economy for a very long time.

Acknowledging that Lesotho is a labour reserve for South African mining and industry rather than portraying it as an autonomous "national economy," moreover, would be to stress the importance of something which is inaccessible to a "development" planner in Lesotho. The World Bank mission to Lesotho is in no position to formulate programmes for changing or controlling the South African mining industry, and it has no disposition to involve itself in political challenges to the South African system of labour control. It is in an excellent position, however, to devise agricultural improvement projects, extension, credit and technical inputs, for the agriculture of Lesotho lies neatly within its jurisdiction, waiting to be "developed."

Taking the Politics out of "Development"

One striking feature of the "development" discourse on Lesotho is the way in which the "development" agencies present the country's economy and society as lying within the control of a neutral, unitary and effective national government, and thus almost perfectly responsive to the blueprints of planners. The state is seen as an impartial instrument for implementing plans and the government as a machine for providing social services and engineering growth.

Excluded from the Bank's analysis are the political character of the state and its class basis, the uses of official positions and state power by the bureaucratic elite and other individuals, cliques and factions, and the advantages to them of bureaucratic "inefficiency" and corruption. The state represents "the people," and mention of the undemocratic nature of the ruling government or of political opposition is studiously avoided. The state is taken to have no interests except "development": where "bureaucracy" is seen as a problem, it is not a political matter, but the unfortunate result of poor organization or lack of training.

Political parties almost never appear in the discourse of the Bank and other "development" institutions, and the explicitly political role played by "development" institutions such as Village Development Committees (VDCs), which often serve as channels for the ruling Basotho National Party (BNP), is ignored or concealed. "The people" tend to appear as an undifferentiated mass, a collection of "individual farmers" and "decision makers," a concept which reduces political and structural causes of poverty to the level of individual "values," "attitudes" and "motivation." In this perspective, structural change is simply a matter of "educating" people, or even just convincing them to change their minds. When a project is sent out to "develop the farmers" and finds that "the farmers" are not much interested in farming, and, in fact, do not even consider themselves to be "farmers," it is thus easy for it to arrive at the conclusion that "the people" are mistaken, that they really are farmers and that they need only to be convinced that this is so for it to be so.

In fact, neither state bureaucracies nor the "development" projects associated with them are impartial, apolitical machines which exist only to provide social services and promote economic growth. In the case of the Canadian- and World Bank–supported Thaba-Tseka Development Project, an agricultural programme in Lesotho's central mountains, Sesotho-language documents distributed to villagers were found to have slogans of the ruling Basotho National Party (BNP) added at the end, although these did not appear in any of the English language versions. Public village meetings conducted by project staff were peppered with political speeches, and often included addresses by a high-ranking police officer on the "security threat" posed by the opposition Basutoland Congress Party. Any money remaining after project costs had been repaid went to the BNP's Village Development Committees—leading one villager to note caustically, "It seems that politics is nowadays nicknamed 'development.'"

Inevitable Failure

Because the picture of Lesotho constructed by the Bank and other "development" agencies bears so little resemblance to reality, it is hardly surprising that most "development" projects have "failed" even on their own terms. Thus after years of accusing local people of being "defeatist" or "not serious" about agriculture, and even implying that wage increases at South African mines were "a threat" to the determination of farmers to become "serious," Thaba-Tseka project experts had to concede that local people were right that little beside maize for local consumption was going to come out of their tiny mountain fields, and that greater investment in agriculture was not going to pay handsome rewards.[10]

Casting themselves in the role of politically-neutral artisans using "development" projects as tools to grab hold of and transform a portion of the country according to a pre-determined plan, "development" officials assumed that the projects were givens and all they had to do was "implement" them.

In the case of the Thaba-Tseka project, for example, planners assumed that it would be a relatively simple matter to devolve much of the decision-making to a newly constituted Thaba-Tseka district, in order to increase efficiency, enable the project to be in closer touch with the needs of "the people" and avoid its becoming entangled in government bureaucracy. But what the planners assumed would be a simple technical reform led—predictably—to a whole range of actors using the reforms for their own ends.

The project's Health Division, for example, was partly appropriated as a political resource for the ruling National Party. Power struggles broke out over the use of project vehicles. Government ministries refused to vote funds to the project and persisted in maintaining their own control over their field staff and making unilateral decisions on actions in the district. An attempt to hire a Mosotho to replace the project's expatriate Canadian director was rejected, since as long as the programme's image remained "Canadian," there could be no danger of bringing about a real "decentralization" of power away from Maseru, Lesotho's capital.

Instead of being a tool used by artisans to resculpt society, in short, the project was itself worked on: it became like a bread crumb thrown into an ant's nest. Plans for decentralization were thus abandoned in 1982. Yet Thaba-Tseka's planners continued to insist that the project's failure resulted somehow from the government's failure to understand the plan, or from the right organizational chart not having been found. Needing to construe their role as "apolitical," they continued to see government as a machine for delivering services, not as a political fact or a means by which certain classes and interests attempted to control the behaviour and choices of others.

A Different Kind of Property

Another example of "failure" stemming from the "development" discourse's false construction of Lesotho is that of livestock "development."

"Development" planners have long seen Lesotho's grasslands as one of the few potentially exploitable natural resources the country possesses,[11] and the country's herds of domestic grazing animals as an inertia-ridden "traditional" sector ripe for transformation by the dynamic "modern" cash economy. What is required, according to planners, is to develop "appropriate marketing outlets," control grassland use to optimize commercial productivity through destocking and grazing associations, introduce improved breeds, and convince "farmers to market their non-productive stock."[12]

Far from being the result of "traditional" inertia, however, the Basotho's reluctance to treat livestock commercially is deeply embedded in, and partly maintained by, a modern, capitalist labour reserve economy. In Lesotho's highly-monetized economy, an item such as a transistor radio or a bar of soap may be subject to the same market mechanisms of pricing, supply and demand as it is anywhere else. Cattle, goats and sheep, however, are subject to very different sorts of rules. Although cash can always be converted into livestock through purchase, there is a reluctance to convert grazing animals to cash through sale, except when there is an emergency need for food, clothes, or school fees.

This practice is rooted in, and reinforced by, a social system in which young working men are away in South Africa supporting their families for ten or eleven months of the year. (Mines hire only men, and it is very difficult for women from Lesotho to find work in South Africa.) If a man comes home from the mines with cash in his pocket, his wife may present him with a demand to buy her a new dress, furniture for the house or new blankets for the children. If, on the other hand, he comes home with an ox purchased with his wages, it is more difficult to make such demands.

One reason that men like to own large numbers of livestock is that they boost their prestige and personal networks in the community, partly since they can be farmed out to friends and relatives to help with their field work. They thus serve as a "place-holder" for the man in the household and the community, symbolically asserting his structural presence and prestigious social position, even in the face of his physical absence. After he has returned to the household because of injury, age or being laid off from the South African mines to "scratch about on the land," livestock begin to be sold in response to absolute shortages of minimum basic necessities. Grazing animals thus constitute a sort of special "retirement fund" for men which is effective precisely because, although it lies within the household, it cannot be accessed in the way cash can.

However useful and necessary they may be, moreover, livestock in Lesotho is less an "industry" or a "sector" than a type (however special) of consumer good bought with wages earned in South Africa when times are good and sold off only when times are bad. The sale of an animal is not "off-take" of a surplus, but part of a process which culminates in the destruction of the herd. A drop in livestock exports from Lesotho is thus not, as the "development" discourse would have it, a sign of a depressed "industry," but of a rise in incomes. For instance, when wages were increased in South African mines in the 1970s, Basotho miners seized the opportunity to invest in cattle in unprecedented numbers, leading to a surge in import figures from 4,067 in 1973 to 57,787 in 1978. Over the same period, meanwhile, cattle export figures dropped

from 12,894 to 574. A boom in exports, on the other hand, would be the mark of a disaster.

Not surprisingly, attempts to "modernize" Lesotho's "livestock sector" have met with resistance. Within one year of the Thaba-Tseka project attempting to fence off 15 square kilometres of rangeland for the exclusive use of "progressive," "commercially-minded" farmers, for example, the fence had been cut or knocked down in many places, the gates stolen, and the area was being freely grazed by all. The office of the association manager had been burned down, and the Canadian officer in charge of the programme was said to be fearing for his life.

This resistance was rooted in more than a general suspicion of the government and the "development" project. To join the official "grazing association" permitted to use the fenced-in land, stock owners were required to sell off many poor animals to buy improved ones, ending up with perhaps half as many. Such sales and restrictions in herd size were not appealing for most Basotho men. Joining the association not only meant accepting selection, culling and marketing of herds. It also meant acquiescing in the enclosure of both common grazing land and (insofar as any Mosotho's livestock are also a social, shared domain of wealth) animals. It thus signified a betrayal of fellow stock-owners who remained outside the organization, an act considered anti-social. Prospective association members also probably feared that their animals—which represent wealth in a visible, exposed, and highly vulnerable form—might be stolen or vandalized in retaliation.

The Side Effects of "Failure"

Despite such disasters, it may be that what is most important about a "development" project is not so much what it fails to do but what it achieves through its "side effects." Rather than repeatedly asking the politically naive question "Can aid programmes ever be made really to help poor people?" perhaps we should investigate the more searching question, "What do aid programmes do *besides* fail to help poor people?"

Leftist political economists have often argued that the "réal" purpose of "development" projects is to aid capitalist penetration into Third World countries. In Lesotho, however, such projects do not characteristically succeed in introducing new relations of production (capitalist or otherwise), nor do they bring about modernization or significant economic transformations. Nor are they set up in such a way that they ever could. For this reason, it seems a mistake to interpret them *simply* as "part of the historical expansion of capitalism" or as elements in a global strategy for controlling or capitalizing peasant production.

Another look at the Thaba-Tseka project, reveals that, although the project "failed" both at poverty alleviation and at extending the influence of international capital, it did have a powerful and far-reaching impact on its region. While the project did not transform livestock-keeping, it did build a road to link Thaba-Tseka more strongly with the capital. While it did not bring about "decentralization" or "popular participation," it was instrumental in establishing a new district administration and giving the government a much stronger presence in the area than it had ever had before.

As a direct result of the construction of the project centre and the decision to make that centre the capital of a new district, there appeared a new post office, a police station, a prison and an immigration control office; there were health officials and nutrition officers and a new "food for work" administration run by the Ministry of Rural Development and the Ministry of Interior, which functioned politically to regulate the power of chiefs. The new district centre also provided a good base for the "Para-Military Unit," Lesotho's army, and near the project's end in 1983, substantial numbers of armed troops began to be garrisoned at Thaba-Tseka.

In this perspective, the "development" apparatus in Lesotho is not a machine for eliminating poverty that is incidentally involved with the state bureaucracy. Rather, it is a machine for reinforcing and expanding the exercise of bureaucratic state power, which incidentally takes "poverty" as its point of entry and justification—launching an intervention that may have no effect on the poverty but does have other concrete effects.

This does not mean that "the state," conceived as a unitary entity, "has" more power to extract surplus, implement programmes, or order around "the masses" more efficiently—indeed, the reverse may be true. It is, rather, that more power relations are referred through state channels and bureaucratic circuits—most immediately, that more people must stand in line and await rubber stamps to get what they want. "It is the same story over again," said one "development" worker. "When the Americans and the Danes and the Canadians leave, the villagers will continue their marginal farming practices and wait for the mine wages, knowing only that now the taxman lives down the valley rather than in Maseru."[13]

At the same time, a "development" project can effectively squash political challenges to the system not only through enhancing administrative power, but also by casting political questions of land, resources, jobs or wages as technical "problems" responsive to the technical "development" intervention. If the effects of a "development" project end up forming any kind of strategically coherent or intelligible whole, it is as a kind of "anti-politics" machine, which, on the model of the "anti-gravity" machine of science fiction stories, seems to suspend "politics" from even the most sensitive political operations at the flick of a switch.

Such a result may be no part of the planners' intentions. It is not necessarily the consequence of any kind of conspiracy to aid capitalist exploitation by incorporating new territories into the world system or working against radical social change, or bribing national elites, or mystifying the real international relationships. The result can be accomplished, as it were, behind the backs of the most sincere participants. It may just happen to be the way things work out.

What Is To Be Done? By Whom?

If, then, "development" cannot be the answer to poverty and powerlessness in Lesotho, what is? What is to be done, if it is not "development"?

Any question of the form "What is to be done?" demands first of all an answer to the question "By whom?" The "development" discourse, and a great deal of policy

science, tends to answer this question in a utopian way by saying "Given an all-powerful and benevolent policy-making apparatus, what should it do to advance the interests of its poor citizens?"

The question is often put in the form "What should *they* do?", with the "they" being not very helpfully specified as "Lesotho" or "the Basotho." When "developers" speak of such a collectivity what they mean is usually the government. But the government of Lesotho is not identical with the people who live in Lesotho, nor is it in any of the established senses "representative" of that collectivity. As in most countries, the government is a relatively small clique with narrow interests. There is little point in asking what such entrenched and often extractive elites should do in order to empower the poor. Their own structural position makes it clear that they would be the last ones to undertake such a project.

Perhaps the "they" in "What should they do?" means "the people." But again, the people are not an undifferentiated mass. There is not one question—What is to be done?—but hundreds: What should the mineworkers do? What should the abandoned old women do? and so on. It seems presumptuous to offer prescriptions here. Toiling miners and abandoned old women know the tactics proper to their situations far better than any expert does. If there is advice to be given about what "they" should do, it will not be dictating general political strategy or giving a general answer to the question "what is to be done?" (which can only be determined by those doing the resisting) but answering specific, localized, tactical questions.

What Should We Do?

If the question is, on the other hand, "What should *we* do?" it has to be specified, which "we"? If "we" means "development" agencies or governments of the West, the implied subject of the question falsely implies a collective project for bringing about the empowerment of the poor. Whatever good or ill may be accomplished by these agencies, nothing about their general mode of operation would justify a belief in such a collective "we" defined by a political programme of empowerment.

For some Westerners, there is, however, a more productive way of posing the question "What should we do?" That is, "What should we intellectuals working in or concerned about the Third World do?" To the extent that there are common political values and a real "we" group, this becomes a real question. The answer, however, is more difficult.

Should those with specialized knowledge provide advice to "development" agencies who seem hungry for it and ready to act on it? As I have tried to show, these agencies seek only the kind of advice they can take. One "developer" asked my advice on what his country could do "to help these people." When I suggested that his government might contemplate sanctions against apartheid, he replied, with predictable irritation, "No, no! I mean development!" The only advice accepted is about how to "do development" better. There is a ready ear for criticisms of "bad development projects," only so long as these are followed up with calls for "good development projects." Yet the agencies who plan and implement such projects—agencies like the World Bank,

USAID, and the government of Lesotho—are not really the sort of social actors that are very likely to advance the empowerment of the poor.

Such an obvious conclusion makes many uncomfortable. It seems to them to imply hopelessness; as if to suggest that the answer to the question "What is to be done?" is: "Nothing." Yet this conclusion does not follow. The state is not the only game in town, and the choice is not between "getting one's hands dirty by participating in or trying to reform development projects" and "living in an ivory tower." Change comes when, as Michel Foucault says, "critique has been played out in the real, not when reformers have realized their ideas."[14]

For Westerners, one of the most important forms of engagement is simply the political participation in one's own society that is appropriate to any citizen. This is, perhaps, particularly true for citizens of a country like the US, where one of the most important jobs for "experts" is combating imperialist policies.

NOTES

1. Murray, C., *Families Divided: The Impact of Migrant Labour in Lesotho*. Cambridge University Press, New York, 1981, p. 19.

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3. "Basutoland", *Encylopedia Britannica*, 1910.

4. Wilson, M. and Thompson, L., (eds.) *The Oxford History of South Africa*, Vol. 1., Oxford University Press, New York, 1969.

5. Ashton, H., *The Basuto: A Social Study of Traditional and Modern Lesotho*, Oxford University Press, New York, 1967 (second edition), p. 162.

6. Murray, C., op. cit. 1.

7. FAO/World Bank, *Draft Report of the Lesotho First Phase Mountain Area Development Project Preparation Mission*, Vols. I and II), FAO, Rome, 1975, Annex 1, p. 7.

8. van der Wiel, A.C.A., *Migratory Wage Labour: Its Role in the Economy of Lesotho*, Mazenod Book Centre, Mazenod, 1977.

9. FAO/World Bank, op. cit. 7, Annex 1, p. 7.

10. See "Appraisal of Project Progress During the Pilot Phase and Review of Plans to Expand Agricultural Programs in Phase II of Project Operations", CIDA, Ottawa, 1978, p. 39.

11. See, for example, FAO/World Bank, op. cit. 7, Annex 1, pp. 10–12. For a related South African history of government intervention into "traditional" livestock keeping, see Beinart, W. and Bundy, C., "State Intervention and Rural Resistance: The Transkei, 1900–1965", in Klein, M., (ed.) *Peasants in Africa*, Sage, Beverley Hills, 1981.

12. CIDA, op. cit. 10.

13. Quoted in Murphy, B., "Smothered in Kindness", *New Internationalist*, No. 82, 1979, p. 13.

14. Foucault, M., "Questions of Method: An Interview", *Ideology and Consciousness*, 8, 1981, p. 13.

Income Levels and the Environment

Wilfred Beckerman

Introduction

Nobody can deny that human activity had been imposing a strain on the environment even before the industrial revolution. The local environment was often severely damaged by over-grazing or destruction of tree cover in many parts of the world. But the scale of environmental damage was negligible compared with what followed from the expansion of the world population and the accompanying growth of economic activity.

Nevertheless this does not mean that rising income levels are inevitably and at all times and in all circumstances associated with a deterioration in the environment. For society has a capacity to react to events. For example, when the sanitary conditions in English cities became intolerable during the middle of the nineteenth century, pressures built up to do something about them and these pressures led to a substantial improvement over the subsequent decades. Or when, in the early 1950s, some British cities were afflicted with terrible smogs leading to the deaths of thousands of people (not to mention the closing down of a famous Opera House for a few days because the singers could only be seen in the front few rows!) public opinion forced the government to take effective action.

And during the last two decades most of the advanced economies in the world have implemented policies—some less effectively than others—to deal with their local pollution problems. There have even been successful conclusions, of international agreements to deal with certain forms of international pollution, such as oil 'spillages' at sea, or the phasing-out of emissions of the CFCs that are believed to damage the ozone layer.[1] It is all a matter of what policies are adopted, and the evidence suggests that increasing affluence is the best route to the adoption of policies that protect the environment.

This chapter will therefore begin with an attempt to put the environmental conditions experienced in advanced countries today into some sort of long-term historical perspective. This will be followed by a brief survey of the relationship between income levels and the three specific environmental media—clean drinking water,

sanitation and urban air quality—which, are among the most important components of human welfare in the 75 per cent of the world's population that live in developing countries. It will be shown that when we focus on these particular features of the environment it remains true that increasing economic prosperity is still the best route to an improvement in these components of human welfare.

The Environment in Historical Perspective

One of the reasons for the currently popular view that economic growth has been accompanied by a decline in welfare is the lack of historical perspective. It is true that in the absence of appropriate policies of environmental protection economic growth may bring with it environmental damage of one kind or another. People are very conscious, for example, of the noise from motorways or jet planes, or how beaches are fouled as a result of inadequate sewage discharges or oil spillages at sea, or of landscape blight caused by industrial development in one way or another, and so on. And no doubt tougher policies to protect the environment in all forms should be implemented. For reasons well known to economists, there is a presumption that, on the whole, the environment will be 'used up' more than is socially desirable, in the absence of special policies, so that there is no cause for complacency. Nevertheless few people realise how bad the environment was in the past in what are now advanced countries and how great an improvement in the environment has taken place.

For example, it is fashionable nowadays to complain about air pollution caused by automobiles in congested urban areas, such as in Central London or New York. But when Chateaubriand was taking up his post at the French Embassy in London in 1822 he wrote: 'At Blackheath, a common frequented by highwaymen, I found a newly built village. Soon I saw before me the immense skull-cap of smoke which covers the city of London. Plunging into the gulf of black mist, as if into one of the mouths of Tartarus, and crossing the whole town, whose streets I recognised, I arrived at the Embassy in Portland Place.'[2] A few decades later it was reported: 'The space bounded by Oxford Street, Portland Place, New Road, Tottenham Court Road, is one vast cesspool, the sewers being so imperfectly constructed that their contents are almost always stagnant … Now when the reader reflects that thousands of working men are closely confined, for perhaps 14 or 15 hours out of the 24, in a room in which the offensive effluvium of some cesspool is mingling with the atmosphere … he will cease to wonder at the amount of disease …'[3]

It is hardly surprising that deaths from typhus alone in England in the mid-nineteenth century were nearly 20,000 a year, and that 60,000 deaths a year were attributed to tuberculosis, not to mention high death-rates from numerous other diseases associated with unhealthy living conditions.[4] Nor were conditions in London by any means unique. Inquiries carried out by the Health of Towns Association into the sanitary conditions in the other main cities and towns produced a more or less uniform picture: 'Bolton—very bad indeed; Bristol—decidedly bad; the mortality is very great; Hull—some parts as bad as can be conceived; many districts very filthy; with a few exceptions, the town and coast drainage extremely bad; great overcrowding, and want of

ventilation generally.'[5] The only places today where such conditions can be found are in the poorer districts of many large cities in relatively low-income countries, such as Calcutta, Manila, Mexico City and Sao Paulo.

Income Levels and Environmental Quality Today

(a) The General Relationship

The main reason for expecting economic growth to be good for the environment, in the longer run, as well as bad for it in specific instances and particular time periods, hardly needs elaboration. It is the only possible interpretation of the evidence. A casual glance at the state of the environment in the principal towns and cities of the world shows that the environment that matters most to human beings—notably access to water and sanitation, housing, social infrastructure and absence of the more traditional types of air pollution such as SO_2 and smoke—is much better in the richer countries than in the poorer. And although the data are more fragmentary, the disparity between the environments in developed and developing countries is even greater in rural areas.

The reason is obvious. As people get richer their priorities change and the environment moves up in the hierarchy of human needs. When their basic needs for food, water, clothing and shelter are satisfied they can begin to attach importance to other ingredients in total welfare, including, eventually, the environment. As public perceptions and concerns move in the environmental direction, so communities will be more willing to allocate resources to this purpose. And this shift in expenditure priorities is easier insofar as richer countries will be more able to afford them.

For example, United States public and private expenditures on pollution abatement and control ('PAC') represent nearly 2 per cent of GNP, which is a higher share than for any other country for which comparative data are available. And the share is still rising.[6] These expenditures rose in the USA at an average annual rate of 3.2 per cent over the period 1972–1987, when total real GNP rose by 2.6 per cent.[7] The only other country for which comparable data are available for any length of time is Germany, where, too, total private and public PAC expenditures rose (at constant prices) at an annual average rate of 3.4 per cent during the period 1975–1985, raising the share of these expenditures in GNP from 1.37 per cent to 1.52 per cent.

These increases in expenditures have done more than just keep pace with the increasing burden that, in principle, higher levels of economic activity can impose on the environment. This is partly because the pattern of output in advanced countries has been changing in a direction that tends to impose less of a burden on the environment than was the case at earlier stages of their development. At higher levels of income industry accounts for a smaller share of GDP, whereas services—which are relatively non-polluting—account for an increasing share. Even within industry there has tended to be a shift away from the highly polluting heavy industries, such as metallurgy and heavy engineering, towards high-tech, high value-added industries employing large amounts of very skilled human capital and with smaller inputs of

energy or raw materials.[8] In addition, policies to combat pollution have of course been introduced mainly in richer countries, since they have the resources to implement their shift in priorities. As a result—as is shown in detail in the next three sections of this chapter—higher incomes are clearly associated with improvements in the environment as far as the most important traditional and ubiquitous pollutants are concerned (which are, of course, those for which there are comparable statistics).

(b) Water and Income Levels

Figure 16.1 shows the percentage of the population with access to safe drinking water in countries with different income levels in 1975 and 1985.[9] Countries have been ranked in order of their incomes per head, and those containing the 20 per cent of the population with the lowest income per head have been put at the left, with successive groups to the right representing countries with higher incomes per head. The average income in each group is shown at the top of the column for each group. The height of the column represents the percentage of the population that had access to safe drinking water.

As can be seen, in 1975 the bottom 20 per cent of the world's population had an average income of $206. Only about a fifth of them had access to safe drinking water. At the other end of the scale, among the top 20 per cent of the population, who had an average income of $2,381 per annum in 1975, almost 80 per cent had access to safe

FIGURE 16.1
Income levels and access to safe drinking water: a cross-country comparison, 1975 and 1985
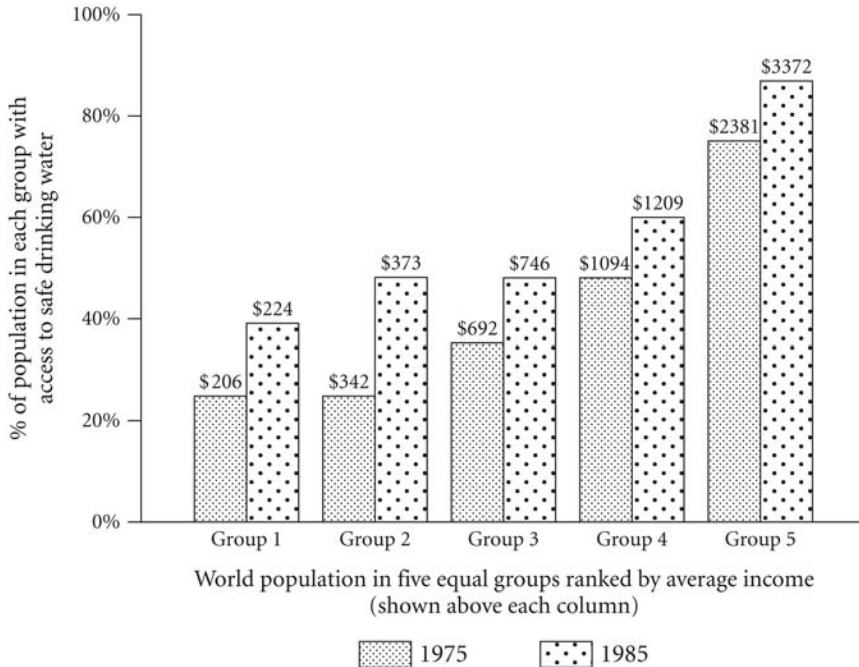
SOURCE: W. Beckerman, *Economic Development and the Environment*

drinking water. In short, as we should expect, higher incomes tend to be associated with a higher proportion of the population having access to safe drinking water. There has also been some progress in almost all countries over the period 1975–1985, in spite of the rapid growth of the population of most developing countries during this period. The relationship between income levels and access to safe drinking water is unambiguous. If you want to increase the proportion of the population with access to clean drinking water, get richer.

Although satisfactory sewerage and sanitation arrangements are more difficult to define and hence to represent in a simple number, *Figure 16.2* also confirms what we should expect, namely that an increase in incomes is the best way of increasing access to the sanitation facilities that most people in advanced countries would take for granted as normal attributes of a minimum standard of living. Of course in many countries the pace of urbanisation has meant that sanitation and waste disposal arrangements have been totally unable to cope with the additional demands and bring the services up to the levels normally associated with even medium-income-level countries. For example, even in Thailand, where the growth of prosperity has been remarkably sustained, it is estimated that in Bangkok only 2 per cent of the population is connected to sewers.

In the longer run, when incomes approach the levels enjoyed currently by advanced countries, we must assume that similar degrees of access to sanitation will be

FIGURE 16.2
Income levels and sanitation, rural and urban: a cross-country comparison, 1985

SOURCE: W. Beckerman, *Economic Development and the Environment*
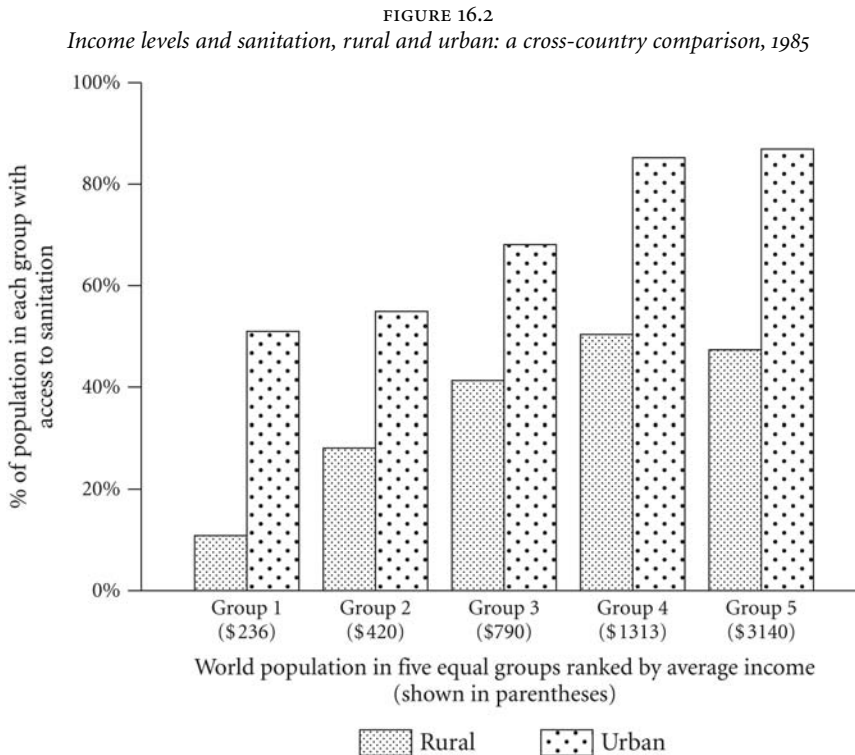
achieved. But very rapid urbanisation poses special problems, even if average incomes are rising, so that in the short-to-medium run the conflict between economic growth and the environment can be more pronounced.

(c) Air Pollution and Income Levels

(i) Sulphur Dioxide (SO$_2$). Sulphur dioxide is one of the most widespread forms of air pollution known in the industrialised world. By combining with water vapour in the atmosphere it is believed to be largely responsible for a whole range of harmful effects, ranging from health effects and local damage to paintwork, metals and so on to acid rain and suspected damage to forests. But in advanced countries the reduction in SO$_2$ has been one of the major success stories in environmental control.[10] In Britain, for example, total SO$_2$ emissions fell by 25 per cent during the 1970s, and by 40 per cent relative to GNP. Similar results have been obtained in almost all other advanced countries, with corresponding improvements in the concentrations of SO$_2$ in the atmosphere.

Indeed if the major cities of the world are put into three groups according to the income levels of the countries in which they are located—low-income, medium-income and high-income—we find a clear change over the last decade or so in the way their income levels are related to their concentrations of SO$_2$. Around the late 1970s the SO$_2$ levels were higher in the higher-income countries, reflecting their greater degree of industrialisation. But about ten years later the position had been reversed. This corresponded to a decline in SO$_2$ concentrations of about 8.9 per cent per annum in the high-income countries and a rise of about 3.7 per cent in the low-income countries. Taking all the 33 cities covered in the data on SO$_2$ ambient air quality produced by the UN Global Environmental Monitoring Service ('GEMS') '27 have downward (at least 3 per cent per year) or stationary trends and 6 have upward trends (at least 3 per cent per year) with most improvements noted in cities of developed countries'.[11]

(ii) SPM or Smoke. A similar story is found in the trends of 'suspended particulate matter' (SPM) and smoke. Of the 37 cities covered in the GEMS data, the concentrations of SPMs and smoke in the air were following downward trends in 19, were more or less stationary in 12 and showed upward trends in only 6. But it is in the richer countries that SPM concentrations have fallen.[12] And, for those cities for which adequate data are available it is also clear that cities in low-income countries had ambient concentrations of SPM or smoke that were much higher than in the richer countries. Furthermore, measured by the number of days on which the World Health Office guidelines for SPM or smoke were exceeded during the course of the year, the preponderance of cities in developing countries is overwhelming.[13]

(iii) NO$_x$ and CO The picture is slightly more confused when we turn to two other pollutants, carbon monoxide (CO) and nitrous oxides (NO$_x$s), since emissions of these, particularly CO, are heavily influenced by the automobile—both the number of automobiles and the speeds at which they are able to circulate.[14] Furthermore, the limitations on inter-city comparability of measures of these pollutants are particularly

severe. Hence, in terms of ambient air concentrations of, say, NO_xs, 'cities of the developing and developed countries are found at both ends of the concentration range … some of the lowest NO_2 values are reported from the two Indian cities Bombay and New Delhi, presumably because traffic levels are relatively low.'[15]

Nevertheless some overall difference can be observed between cities in poor and rich countries. For example, although there are some exceptions—notably London, Frankfurt and Amsterdam—trends in ambient NO_2 concentrations in most other cities in developed countries are now stable or declining, in spite of sustained increases in automobile numbers. By contrast, the trends are generally rising in cities in developing countries.[16] The picture is roughly the same for CO ambient concentrations. Data are only available for cities in eleven countries, and CO concentrations are declining in all of them. With one exception—Santiago—the cities are all in high-income countries. By contrast, fragmentary data for a few individual cities in developing countries confirm the rise in concentrations of these pollutants.

(iv) Lead Another highly publicised pollutant is lead in gasoline. In recent years almost all industrialised countries have taken effective measures of one kind or another to reduce lead emissions from automobiles, often with striking results. For example, the total quantity of lead used in gasoline in the USA was cut from 170,000 tons in 1975 to 40,000 tons in 1984, and Japan has made even greater progress. By contrast: 'Few developing countries have yet made significant reductions in petrol lead content …'[17]

In general therefore, although we cannot say precisely how overall 'air quality' should be defined, or at exactly what level further increases in incomes lead to improvements in air quality, it is fairly clear that it does so sooner or later. How much sooner or later—i.e. at what point in time or level of income—urban air conditions reach a state when effective policies are introduced will depend on a host of variables, including technical, social and political variables. It is not surprising, therefore, that the record of individual countries shows a reversal in the trend in the traditional pollutants (SO_2 and SPM or smoke) at very different stages in their history.

The Role of Policy

This last point illustrates the role of policy in shaping the precise relationship between economic growth and environmental pollution. In the longer run higher incomes are clearly associated with improved environments, but the transition period may be a long and painful one, during which the environment can seriously deteriorate. How long and painful is the transition period depends largely on the policies pursued by governments, but partly on other variables. Changes in the pattern of output, or in the technical relationships between specific economic activities and their environmental impacts, have played a major part. But changes in social structures, political pressures, public awareness and, above all, the resulting policies adopted by the authorities have also been important.

However, policies do not emerge in a vacuum independently of accompanying economic and social conditions. The former are often very dependent on the latter.

The stringent air pollution controls would probably not have been introduced in Britain in the 1950s, even after the notorious 'killer' smog of 1952 in London, had not other factors led to a shift to more efficient forms of heating in many homes and to the virtual disappearance of cheap domestic service.[18] In the same way, the absence of democracy in the Soviet bloc was no doubt largely responsible for the failure of the authorities to worry much about the environment. What mattered was the achievement of the planned production targets. The welfare of the citizens was of minor importance.

At the same time, the above data show that a country's environmental priorities depend largely on its income level. In the past, when income levels were much lower than they are today, developing countries did not worry much about pollution. In the early 1970s, for example, countries such as Brazil and Algeria were in the forefront of the opposition to the then newly emerging shift of emphasis—in the richer countries—away from economic growth in favour of more care for its environmental effects. At the World Environment Conference in Stockholm in 1972 Brazil made it clear that it intended to continue to industrialise without concern for environmental problems. But conditions in cities such as Sao Paulo were already becoming almost intolerable, and within a few years there was a major shift in policy in the direction of environmental protection.[19] By the mid-1980s, even though industrial production and vehicle numbers were still rising in the Sao Paulo area, the main air pollutants were falling.[20]

Air pollution from road transport provides a striking example of the way policies determine the incidence of any particular form of pollution. The severity of this problem in the fast-growing cities of developing countries has been mentioned already. By contrast, the largest reductions in automotive pollutants have been achieved in Japan, Germany and the USA as a result of their relatively early introduction of stringent controls on motor vehicles. There has been a move in this direction in most Western European countries, although in some cases the policies adopted so far seem to have been offset by increases in the number of vehicles.[21] Similar regulatory measures have also been introduced recently in some developing countries, but so far, with one or two exceptions, not with much effect, and, as discussed earlier, this is largely the result of their generally lower ability to afford, or monitor, the required policy changes.[22]

NOTES

1. An excellent up-to-date survey of some of the reasons for doubting the widespread acceptance of the need to reduce the use of CFCs in order to protect the ozone layer is provided in Singer, F., 1994.

2. *Memoirs of Chateaubriand*, p. 141.

3. The Metropolitan Working Classes' Association for Improving the Public Health, 1847, pp. 6–7.

4. See Gavin, H., 1847, p. 33. See also Holland, E.C., 1843, and Hammond, J.L., 1917, ch. 3.

5. Health of Towns Association, 1848, p. 7.

6. OECD, 1990, table 2, p. 40.

7. Farber, K.D. and Rutledge, G., 1989, pp. 19–23.

8. Gordon Hughes argues (1990, p. ii), that insofar as Eastern European economies develop along the lines of the currently advanced Western economies their pollution intensities, and possibly levels, will decline precisely on account of this shift in economic structure that seems to characterise economic growth in almost all countries of the world.

9. For various reasons figures for individual countries are not strictly comparable, so that a more reasonable picture of the income/water supply relationship is provided by grouping countries into broad income bands. Country income levels are at constant (1987) $US. For details of individual countries and sources and definitions, see Beckerman, W., 1992.

10. See, for example, OECD, 1991, figure 9, 'Trends in man-made sulphur oxide emissions', p. 37.

11. UNEP/WHO GEMS, 1988, p. 15.

12. See details and sources in Beckerman, W., 1992, table 3.4.

13. The six worst cities, taking the average of 1980–84, in the GEMS ranking, were Teheran, Shenyang, Calcutta, Beijing, Xian and New Delhi, with Bombay, Kuala Lumpur and Bangkok not far behind. In these cities SPM and smoke levels exceeded the WHO guideline for the 98th percentile (i.e. the exposure level that should not be exceeded more than 2 per cent of the time, or 7 days a year) for anything between 200 days and 300 days per year (UNEP/WHO GEMS, 1988, figure 4.9, p. 33).

14. Up to a point the emission of pollutants from an automobile falls off rapidly as its speed increases, so that a major cause of urban air pollution from automobiles is traffic congestion. See Faiz, A. et al., 1990, tables 19, 20, and 21, pp. 42, 43, and 46.

15. UNEP/WHO GEMS, 1988, p. 44.

16. Ibid., p. 43. Even here, however, there are notable exceptions, namely Singapore.

17. UNEP/WHO GEMS, 1988, p. 60.

18. Ashby, E. and Anderson, M., 1981, p. 116, and Brimblecombe, P., 1987, p. 170.

19. See World Bank, 1990, p. 35 et seq.

20. Ibid., figure IV-1, p. 79.

21. UNEP/WHO GEMS, 1988, pp. 38–57.

22. For example, in Bangkok tighter standards on emissions were introduced as far back as 1979, but it has proved impossible fully to monitor and hence enforce these standards in a city in which the number of vehicles has grown rapidly to its present level of well over 2 million. Tighter restrictions were introduced in subsequent years and further reductions in permitted lead and sulphur levels are to be introduced in 1992 and 1993, but given the extra expenditures that this will require by the petroleum refining and distribution industries, together with the increased monitoring burden, it is far from certain that the newer standards will be fully implemented. (See internal World Bank memo by Christopher Redfern on 'Thailand: Environment', May 9th 1991.)

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Staying Alive
Women, Ecology, and Development

Vandana Shiva

Development, Ecology and Women

Development as a New Project of Western Patriarchy

'Development' was to have been a post-colonial project, a choice for accepting a model of progress in which the entire world remade itself on the model of the colonising modern west, without having to undergo the subjugation and exploitation that colonialism entailed. The assumption was that western style progress was possible for all. Development, as the improved well-being of all, was thus equated with the westernisation of economic categories—of needs, of productivity, of growth. Concepts and categories about economic development and natural resource utilisation that had emerged in the specific context of industrialisation and capitalist growth in a centre of colonial power, were raised to the level of universal assumptions and applicability in the entirely different context of basic needs satisfaction for the people of the newly independent Third World countries. Yet, as Rosa Luxemberg has pointed out, early industrial development in western Europe necessitated the permanent occupation of the colonies by the colonial powers and the destruction of the local 'natural economy'.[1] According to her, colonialism is a constant necessary condition for capitalist growth: without colonies, capital accumulation would grind to a halt. 'Development' as capital accumulation and the commercialisation of the economy for the generation of 'surplus' and profits thus involved the reproduction not merely of a particular form of creation of wealth, but also of the associated creation of poverty and dispossession. A replication of economic development based on commercialisation of resource use for commodity production in the newly independent countries created the internal colonies.[2] Development was thus reduced to a continuation of the process of colonisation; it became an extension of the project of wealth creation in modern western patriarchy's economic vision, which was based on the exploitation or exclusion of women (of the west and non-west), on the exploitation and degradation of nature, and on the exploitation and erosion of other cultures. 'Development' could

not but entail destruction for women, nature and subjugated cultures, which is why, throughout the Third World, women, peasants and tribals are struggling for liberation from 'development' just as they earlier struggled for liberation from colonialism.

The UN Decade for Women was based on the assumption that the improvement of women's economic position would automatically flow from an expansion and diffusion of the development process. Yet, by the end of the Decade, it was becoming clear that development itself was the problem. Insufficient and inadequate 'participation' in 'development' was not the cause for women's increasing under-development; it was rather, their enforced but asymmetric participation in it, by which they bore the costs but were excluded from the benefits, that was responsible. Development exclusivity and dispossession aggravated and deepened the colonial processes of ecological degradation and the loss of political control over nature's sustenance base. Economic growth was a new colonialism, draining resources away from those who needed them most. The discontinuity lay in the fact that it was now new national elites, not colonial powers, that masterminded the exploitation on grounds of 'national interest' and growing GNPS, and it was accomplished with more powerful technologies of appropriation and destruction.

Ester Boserup[3] has documented how women's impoverishment increased during colonial rule; those rulers who had spent a few centuries in subjugating and crippling their own women into de-skilled, de-intellectualised appendages, disfavoured the women of the colonies on matters of access to land, technology and employment. The economic and political processes of colonial under-development bore the clear mark of modern western patriarchy, and while large numbers of women and men were impoverished by these processes, women tended to lose more. The privatisation of land for revenue generation displaced women more critically, eroding their traditional land use rights. The expansion of cash crops undermined food production, and women were often left with meagre resources to feed and care for children, the aged and the infirm, when men migrated or were conscripted into forced labour by the colonisers. As a collective document by women activists, organisers and researchers stated at the end of the UN Decade for Women, 'The almost uniform conclusion of the Decade's research is that with a few exceptions, women's relative access to economic resources, incomes and employment has worsened, their burden of work has increased, and their relative and even absolute health, nutritional and educational status has declined.'[4]

The displacement of women from productive activity by the expansion of development was rooted largely in the manner in which development projects appropriated or destroyed the natural resource base for the production of sustenance and survival. It destroyed women's productivity both by removing land, water and forests from their management and control, as well as through the ecological destruction of soil, water and vegetation systems so that nature's productivity and renewability were impaired. While gender subordination and patriarchy are the oldest of oppressions, they have taken on new and more violent forms through the project of development. Patriarchal categories which understand destruction as 'production' and regeneration of life as 'passivity' have generated a crisis of survival. Passivity, as an assumed category of the 'nature' of nature and of women, denies the activity of nature and life. Fragmentation and uniformity as assumed categories of progress and development

destroy the living forces which arise from relationships within the 'web of life' and the diversity in the elements and patterns of these relationships.

The economic biases and values against nature, women and indigenous peoples are captured in this typical analysis of the 'unproductiveness' of traditional natural societies:

> Production is achieved through human and animal, rather than mechanical, power. Most agriculture is unproductive; human or animal manure may be used but chemical fertilisers and pesticides are unknown.... For the masses, these conditions mean poverty.[5]

The assumptions are evident: nature is unproductive; organic agriculture based on nature's cycles of renewability spells poverty; women and tribal and peasant societies embedded in nature are similarly unproductive, not because it has been demonstrated that in cooperation they produce *fewer* goods and services for needs, but because it is assumed that 'production' takes place only when mediated by technologies for commodity production, even when such technologies destroy life. A stable and clean river is not a productive resource in this view: it needs to be 'developed' with dams in order to become so. Women, sharing the river as a commons to satisfy the water needs of their families and society are not involved in productive labour: when substituted by the engineering man, water management and water use become productive activities. Natural forests remain unproductive till they are developed into monoculture plantations of commercial species. Development thus, is equivalent to maldevelopment, a development bereft of the feminine, the conservation, the ecological principle. The neglect of nature's work in renewing herself, and women's work in producing sustenance in the form of basic, vital needs is an essential part of the paradigm of maldevelopment, which sees all work that does not produce profits and capital as non- or unproductive work. As Maria Mies[6] has pointed out, this concept of surplus has a patriarchal bias because, from the point of view of nature and women, it is not based on material surplus produced *over and above* the requirements of the community: it is stolen and appropriated through violent modes from nature (who needs a share of her produce to reproduce herself) and from women (who need a share of nature's produce to produce sustenance and ensure survival).

From the perspective of Third World women, productivity is a measure of producing life and sustenance; that this kind of productivity has been rendered invisible does not reduce its centrality to survival—it merely reflects the domination of modern patriarchal economic categories which see only profits, not life.

Maldevelopment as the Death of the Feminine Principle

In this analysis, maldevelopment becomes a new source of male-female inequality. 'Modernisation' has been associated with the introduction of new forms of dominance. Alice Schlegel[7] has shown that under conditions of subsistence, the interdependence and complementarity of the separate male and female domains of work is the characteristic mode, based on diversity, not inequality. Maldevelopment militates against this equality in diversity, and superimposes the ideologically constructed category of western technological man as a uniform measure of the worth of classes,

cultures and genders. Dominant modes of perception based on reductionism, duality and linearity are unable to cope with equality in diversity, with forms and activities that are significant and valid, even though different. The reductionist mind super-imposes the roles and forms of power of western male-oriented concepts on women, all non-western peoples and even on nature, rendering all three 'deficient', and in need of 'development'. Diversity, and unity and harmony in diversity, become epistemologically unattainable in the context of maldevelopment, which then becomes synonymous with women's underdevelopment (increasing sexist domination), and nature's depletion (deepening ecological crises). Commodities have grown, but nature has shrunk. The poverty crisis of the South arises from the growing scarcity of water, food, fodder and fuel, associated with increasing maldevelopment and ecological destruction. This poverty crisis touches women most severely, first because they are the poorest among the poor, and then because, with nature, they are the primary sustainers of society.

Maldevelopment is the violation of the integrity of organic, interconnected and interdependent systems, that sets in motion a process of exploitation, inequality, injustice and violence. It is blind to the fact that a recognition of nature's harmony and action to maintain it are preconditions for distributive justice. This is why Mahatma Gandhi said, 'There is enough in the world for everyone's need, but not for some people's greed.'

Maldevelopment is maldevelopment in thought and action. In practice, this fragmented, reductionist, dualist perspective violates the integrity and harmony of man in nature, and the harmony between men and women. It ruptures the co-operative unity of masculine and feminine, and places man, shorn of the feminine principle, above nature and women, and separated from both. The violence to nature as symptomatised by the ecological crisis, and the violence to women, as symptomatised by their subjugation and exploitation arise from this subjugation of the feminine principle. I want to argue that what is currently called development is essentially maldevelopment, based on the introduction or accentuation of the domination of man over nature and women. In it, both are viewed as the 'other', the passive non-self. Activity, productivity, creativity which were associated with the feminine principle are expropriated as qualities of nature and women, and transformed into the exclusive qualities of man. Nature and women are turned into passive objects, to be used and exploited for the uncontrolled and uncontrollable desires of alienated man. From being the creators and sustainers of life, nature and women are reduced to being 'resources' in the fragmented, anti-life model of maldevelopment.

The Violence of Reductionism

The myth that the 'scientific revolution' was a universal process of intellectual progress is being steadily undermined by feminist scholarship and the histories of science of non-western cultures. These are relating the rise of the reductionist paradigm with the subjugation and destruction of women's knowledge in the west, and the knowledge of non-western cultures. The witch-hunts of Europe were largely a process of delegitimising and destroying the expertise of European women. In 1511, England had

an Act of Parliament directed against 'common artificers, as smythes, weavers and women who attempt great cures and things of great difficulties: in the witch they partly use sorcerye and witch-craft'.[8] By the sixteenth century women in Europe were totally excluded from the practice of medicine and healing because 'wise women' ran the risk of being declared witches. A deeper, more violent form of exclusion of women's knowledge and expertise, and of the knowledge of tribal and peasant cultures is now under way with the spread of the masculinist paradigm of science through 'development'.

I characterise modern western patriarchy's special epistemological tradition of the 'scientific revolution' as 'reductionist' because it reduced the capacity of humans to know nature both by excluding other knowers and other ways of knowing, and it reduced the capacity of nature to creatively regenerate and renew itself by manipulating it as inert and fragmented matter. Reductionism has a set of distinctive characteristics which demarcates it from all other non-reductionist knowledge systems which it has subjugated and replaced. The basic ontological and epistemological assumptions of reductionism are based on homogeneity. It sees all systems as made up of the same basic constituents, discrete, unrelated and atomistic, and it assumes that all basic processes are mechanical. The mechanistic metaphors of reductionism have socially reconstituted nature and society. In contrast to the organic metaphors, in which concepts of order and power were based on interconnectedness and reciprocity, the metaphor of nature as a machine was based on the assumption of separability and manipulability. This domination is inherently violent, understood here as the violation of integrity. Reductionist science is a source of violence against nature and women because it subjugates and dispossesses them of their full productivity, power and potential. The epistemological assumptions of reductionism are related to its ontological assumptions: uniformity allows the knowledge of parts of a system to be taken as knowledge of the whole. Separability allows context-free abstraction of knowledge and creates criteria of validity based on alienation and non-participation, then projected as 'objectivity'. 'Experts' and 'specialists' are thus projected as the only legitimate knowledge seekers and justifiers.

Profits, Reductionism and Violence

The close nexus between reductionist science, patriarchy, violence and profits is explicit in 80 per cent of scientific research that is devoted to the war industry, and is frankly aimed directly at lethal violence—violence, in modern times, not only against the enemy fighting force but also against the much larger civilian population. I argue that modern science is related to violence and profits even in peaceful domains such as, for example, forestry and agriculture, where the professed objective of scientific research is human welfare. The relationship between reductionism, violence and profits is built into the genesis of masculinist science, for its reductionist nature is an epistemic response to an economic organisation based on uncontrolled exploitation of nature for maximization of profits and capital accumulation.

Reductionism, far from being an epistemological accident, is a response to the needs of a particular form of economic and political organisation.[9] The reductionist

world-view, the industrial revolution and the capitalist economy were the philosophical, technological and economic components of the same process. Individual firms and the fragmented sector of the economy, whether privately owned or state owned, have only their own efficiency and profits in mind; and every firm and sector measures its efficiency by the extent to which it maximizes its gains, regardless of the maximization of social and ecological costs. The logic of this internal efficiency has been provided by reductionism. Only those properties of a resource system are taken into account which generate profits through exploitation and extraction; properties which stabilise ecological processes but are commercially non-exploitative are ignored and eventually destroyed.

Commercial capitalism is based on specialised commodity production. Uniformity in production, and the uni-functional use of natural resources is therefore required. Reductionism thus reduces complex ecosystems to a single component, and a single component to a single function. It further allows the manipulation of the ecosystem in a manner that maximizes the single-function, single-component exploitation. In the reductionist paradigm, a forest is reduced to commercial wood, and wood is reduced to cellulose fibre for the pulp and paper industry. Forests, land and genetic resources are then manipulated to increase the production of pulpwood, and this distortion is legitimised scientifically as overall productivity increase, even though it might decrease the output of water from the forest, or reduce the diversity of life forms that constitute a forest community. The living and diverse ecosystem is thus violated and destroyed by 'scientific' forestry and forestry 'development'. In this way, reductionist science is at the root of the growing ecological crisis, because it entails a transformation of nature such that its organic processes and regularities and regenerative capacities are destroyed.

Women in sustenance economies, producing and reproducing wealth in partnership with nature, have been experts in their own right of a holistic and ecological knowledge of nature's processes. But these alternative modes of knowing, which are oriented to social benefits and sustenance needs, are not recognised by the reductionist paradigm, because it fails to perceive the interconnectedness of nature, or the connection of women's lives, work and knowledge with the creation of wealth.

The rationality and efficacy of reductionist and non-reductionist knowledge systems are never *evaluated* cognitively. The rationality of reductionist science is, a priori, declared superior. If reductionist science has displaced non-reductionist modes of knowing, it has done so not through cognitive competition, but through political support from the state: development policies and programmes provide the financial and material subsidies *as well as* the ideological support for the appropriation of nature for profits. Since the twin myths of progress (material prosperity) and superior rationality lost their sheen in the working out of development patterns and paradigms, and were visibly exploded by widespread ecological crises, the state stepped in to transform the myths into an ideology. When an individual firm or sector directly confronts the larger society in its appropriation of nature on grounds of progress and rationality, people can assess social costs and private benefits for themselves; they can differentiate between progress and regression, rationality and irrationality. But with the mediation of the state, subjects and citizens become objects of change rather than its

determinants, and consequently lose both the capability and the right to assess progress. If they have to bear the costs instead of reaping the benefits of 'development', this is justified as a minor sacrifice for the 'national interest'.

The nexus between the state, the dominant elite and the creation of surplus value provides the power with which reductionism establishes its supremacy. Institutions of learning in agriculture, medicine and forestry, selectively train people in the reductionist paradigms, in the name of 'scientific' agriculture, medicine and forestry to establish the superiority of reductionist science. Stripped of the power the state invests it with, reductionism can be seen to be cognitively weak and ineffective in responding to problems posed by nature. Reductionist forestry has destroyed tropical forests, and reductionist agriculture is destroying tropical farming. As a system of knowledge about nature or life reductionist science is weak and inadequate; as a system of knowledge for the market, it is powerful and profitable. Modern science, as we have noted earlier, has a world-view that both supports and is supported by the socio-political-economic system of western capitalist patriarchy which dominates and exploits nature, women and the poor.

The ultimate reductionism is achieved when nature is linked with a view of economic activity in which money is the only gauge of value and wealth. Life disappears as an organising principle of economic affairs. But the problem with money is that it has an asymmetric relationship to life and living processes. Exploitation, manipulation and destruction of the life in nature can be a source of money and profits but neither can ever become a source of nature's life and its life-supporting capacity. It is this asymmetry that accounts for a deepening of the ecological crises as a decrease in nature's life-producing potential, along with an increase of capital accumulation and the expansion of 'development' as a process of replacing the currency of life and sustenance with the currency of cash and profits. The 'development' of Africa by western experts is the primary cause for the destruction of Africa; the 'development' of Brazil by transnational banks and corporations is the primary cause for the destruction of the richness of Amazonian rainforests, the highest expression of life. Natives of Africa and Amazonia had survived over centuries with their ecologically evolved, indigenous knowledge systems. What local people had conserved through history, western experts and knowledge destroyed in a few decades, a few years even.

It is this destruction of ecologies and knowledge systems that I characterise as the violence of reductionism which results in: *a) Violence against women:* women, tribals, peasants as the knowing subject are violated socially through the expert/non-expert divide which converts them into non-knowers even in those areas of living in which through daily participation, they are the real experts—and in which responsibility of practice and action rests with them, such as in forestry, food and water systems. *b) Violence against nature:* nature as the object of knowledge is violated when modern science destroys its integrity of nature, both in the process of perception as well as manipulation. *c) Violence against the beneficiaries of knowledge:* contrary to the claim of modern science that people in general are ultimately the beneficiaries of scientific knowledge, they—particularly the poor and women—are its worst victims, deprived of their productive potential, livelihoods and life-support systems. Violence against nature recoils on man, the supposed beneficiary. *d) Violence against knowledge:* in

order to assume the status of being the only legitimate mode of knowledge, rationally superior to alternative modes of knowing, reductionist science resorts *to the suppression and falsification of facts* and thus commits violence against science itself. It declares organic systems of knowledge irrational, and rejects the belief systems of others without full rational evaluation. At the same time it protects itself from the exposure and investigation of the myths it has created by assigning itself a new sacredness that forbids any questioning of the claims of science.

NOTES

1. Rosa Luxemberg, *The Accumulation of Capital*, London: Routledge and Kegan Paul, 1951.

2. An elaboration of how 'development' transfers resources from the poor to the well-endowed is contained in J. Bandyopadhyay and V. Shiva, 'Political Economy of Technological Polarisations' in *Economic and Political Weekly*, Vol. XVIII, 1982, pp. 1827–32; and J. Bandyopadhyay and V. Shiva, 'Political Economy of Ecology Movements', in *Economic and Political Weekly*, forthcoming.

3. Ester Boserup, *Women's Role in Economic Development*, London: Allen and Unwin, 1970.

4. Development Alternatives with Women for a New Era (DAWN), *Development Crisis and Alternative Visions: Third World Women's Perspectives*, Bergen: Christian Michelsen Institute, 1985, p. 21.

5. M. George Foster, *Traditional Societies and Technological Change*, Delhi: Allied Publishers, 1973.

6. Maria Mies, *Patriarchy and Accumulation on a World Scale*, London: Zed Books, 1986.

7. Alice Schlegel (ed.), *Sexual Stratification: A Cross-Cultural Study*, New York: Columbia University Press, 1977.

8. Quoted in Muriel J. Hughes, *Women Healers in Medieval Life and Literature*, New York: Libraries Press, 1968, p. 86.

9. J. Bandyopadhyay & V. Shiva, 'Ecological Sciences: A Response to Ecological Crises' in J. Bandyopadhyay, *et al., India's Environment*, Dehradun: Natraj, 1985, p. 196; and J. Bandyopadhyay & V. Shiva, 'Environmental Conflicts and Public Interest Science,' in *Economic and Political Weekly*, Vol. XXI, No. 2, Jan. 11, 1986, pp. 84–90.

Measuring up to Sustainability

Alan Fricker

Over the past two decades interest has grown in developing indicators to measure sustainability. Sustainability is presently seen as a delicate balance between the economic, environmental and social health of a community, nation and, of course, the Earth. Measures of sustainability at present tend to be an amalgam of economic, environmental and social indicators. Economic indicators have been used to measure the state of the economy for much of this century. Social indicators are largely a post-WWII phenomenon and environmental indicators are more recent still. Interest in developing these indicators largely began when their respective theatres became stressed and where the purpose was to monitor performance and to indicate if any ameliorating action was required. Whereas economists have no difficulty deriving objective and quantitative indicators (their relevance is another matter), sociologists had and still have great difficulty in deriving indicators, because of intangible quality of life issues. Environmental scientists have less difficulty when limiting themselves to abundance of single species rather than biodiversity and ecological integrity.

Sustainability, however, is more than just the interconnectedness of the economy, society and the environment. Important though these are, they are largely only the external manifestations of sustainability. The internal, fundamental, and existential dimensions are neglected. Sustainability, therefore, may be something more grand and noble, a dynamic, a state of collective grace, a facet of Gaia, even of Spirit. Rather than ask how we can measure sustainability, it may be more appropriate to ask how we measure up to sustainability.

The Concept of Sustainability

Sustainability, at least as a concept, has permeated most spheres of life, not solely because it is a political requirement but because it clearly resonates with something deep within us, even though we have a poor understanding of what it is. The concept first emerged in the early 1970s but it exploded onto the global arena in 1987 with the Brundtland Report,[1] in which sustainable development is defined as *development that*

meets the needs of the present without compromising the ability of future generations to meet their own needs.

This very noble definition, however, defies objective interpretation or operational implementation. Most of us would see our own personal needs within the context of our circumstances rather than as absolutes. Our perceptions of the needs of future generations, therefore, beggar the imagination. 'How much is enough?' is a question we have to explore together but can only answer individually. Yet we rarely ask this key question of ourselves individually, let alone collectively.

Once the ecological integrity of the Earth is ensured and our basic needs are satisfied, how much is enough? The question should be posed mostly in the developed countries where, amidst the affluence, there is still inequity. Increasing and deliberate inequity at that, for it is a necessary feature of a growth economy and the driver of material self-advancement. Desirable though high standards of living may be, there are finite global limits. Since our concern for the environment decreases as we become more affluent,[2] we should not expect our quest for sustainability to increase as we become more affluent. Indeed, the few examples of sustainability that we have are where there is no affluence, the states of Kerala and Cuba, and in Amish and Mennonite communities. Here there is greater equity, justice and social cohesion. The challenge for the affluent developed world is to strive for equity and justice, whilst at the same time creating the conditions for appropriate qualitative development.

There are other definitions of sustainability which sidestep human needs, preferring to talk about ecological integrity, diversity and limits. These too defy objective interpretation. These deficiencies in the definitions, if that is what they are, cause much frustration to the rational mind, particularly for those trying to measure sustainability.[3] Meanwhile our reductionist mentality has tended to link it in a servile capacity to quantitative and productive activity, such as sustainable agriculture, forestry, land management, fisheries, etc. In consequence sustainable growth and sustainable development have been captured by the dominant paradigm where, for example:

> sustainable development is brandished as a new standard by those who do not really wish to change the current pattern of development[4]

and

> sustainable development alone does not lead to sustainability. Indeed, it may in fact support the longevity of the unsustainable path.[5]

But the concept is still with us and getting stronger.

We have a better understanding of what is unsustainable rather than what is sustainable. Unsustainability is commonly seen as environmental (in its broad sense) degradation, from the stresses of human population, affluence and technology on ecological and global limits. Since these stresses are all of our own construction, their control is, theoretically at least, within our capabilities. Human nature being what it is, we may push the global physical and biological capacities to their very limits, which will be survival rather than sustainability. Survival is merely not dying, whereas we probably think of sustainability in terms of justice, interdependence, sufficiency, choice and above all (if we were to think deeply about it) the meaning of life.

Sustainability, therefore, is also about the non-material side of life—the intuitive, the emotional, the creative and the spiritual, for which we need to engage all our ways of learning (being and insight as well as doing and knowing). Perhaps there are indeed some fundamental and universal truths if meaning and spirituality are components of sustainability. Morals and values, however, are not necessarily absolutes, and can be very difficult to define. Values, for instance, are qualities we absorb from our experiences. If our experiences confirm the implicit values, we are more likely to adopt those values. When our experiences continually contradict the implicit values we are more likely to modify our personal values to the projected values, i.e. we do as we are done by rather than as we are told. New ways of thinking need to emerge. Even Einstein recognised that *we cannot solve the problems that we have created with the same thinking that created them.* The very etymology of sustainability contains both its appeal and its paradox—*to hold together with tension.*

The beauty in our inability to define sustainability means that we cannot prescribe it. The future may then unfold according to our visions and abilities provided we recognise the global limits. Sachs[6] presents three perspectives of sustainable development: the *contest* perspective that implies growth is possible infinitely in time; the *astronaut's* perspective that recognises that development is precarious in time; and the *home* perspective that accepts the finiteness of development. These could be considered, respectively, as the perspectives of the dominant paradigm, the precautionary principle, and the conservationist. There are, and will be, many other perspectives.

For a generation now we have wrestled with the concept. We may have as much difficulty with sustainability as we did with the concept of evolution 150 years ago. Wilber[7] suggests that the whole of history, and thereby evolution and the future, is a collective transcendence or transformation. We have been ignoring subjective and non-physical dimensions of the collective self as well as the individual self. In so doing we have both created the ecological crisis and prevented ourselves from transcending it. Thus, any debate about sustainability is essentially a debate about ultimate meaning—the what, who, why and how am I. But we are extremely reluctant to engage in that debate on a collective basis, not even locally let alone nationally or globally, partly because it's messy, interpretive and time-consuming—the world of hermeneutics. There is, therefore, a crisis of perception. On this side of the crisis there is mainly banality, whereas on the other side we see only uncertainty and fear.[8]

The Social Discourse on Sustainability

There is little dispute that our present path is unsustainable. The challenge of sustainability is neither wholly technical nor rational. It is one of change in attitude and behaviour. Sustainability must therefore include the social discourse where the fundamental issues are explored collaboratively within the groups or community concerned. We do not do that very well, partly because of increasing populations, complexity, distractions and mobility, but more because of certain characteristics of the dominant paradigm that are seen as desirable.

Where the discourse does occur it tends to be structured and rational where aggressive debate is esteemed and other ways of knowing and experiential knowledge,

particularly of indigenous peoples, and feelings are disregarded. However, the process of discourse is as important as the analysis of discourse where knowing and acting could be seen as points on a journey, rather than as an end, as a start or a new beginning.[9] In sociological terms sustainability is an *absent referent* or the *absence of a presence*. Viederman[10] may have come closest to a definition with *sustainability is a vision of the future that provides us with a road map and helps us focus our attention on a set of values and ethical and moral principles by which to guide our actions.*

People, however, will not readily enter into abstract discourse, particularly where they suspect they will have to get by with less or that their standard of living will decline—at least not until the need for discourse becomes inevitable and perhaps too late. Agenda 21 requires developed countries to reduce their use of natural resources and production of wastes whilst simultaneously improving human amenities and the environment. That statement does not necessarily imply a reduction in the standard of living (defined for the moment as material consumption). Through greater efficiencies it could mean maintaining the standard whilst simultaneously improving the quality of life. In that event we would be more willing to enter into further discourse to see if further improvements in the quality of life can be achieved, even at the expense of the standard of living if necessary. Just as human needs are not absolutes, neither is the standard of living nor the quality of life. The mystics may well indeed be the enlightened ones. Involuntary simplicity on the other hand is a form of poverty. Simultaneously within this social discourse the visions for the future can emerge.

Viederman suggests three principles to underlie the discourse on sustainability:

1. the humility principle, which recognises the limitations of human knowledge;
2. the precautionary principle, which advocates caution when in doubt; and
3. the reversibility principle, which requires us not to make any irreversible changes.

Indicators in General

Monitoring and indicators have always been essential components of closed physical systems. They are integral to the scientific method. In this context each indicator should have a threshold and a target to guide political and social action. Their usefulness for closed socio/biophysical systems (e.g. human well-being, confined ecosystems) and particularly for open physical systems (e.g. corporations, national economies, regional sustainability) is still really unknown, in that accommodation of the full impact of the externalities may not be possible. Ultimately, however, the Earth is a closed system, except for the energy flux. In that sense accurate measures are theoretically possible at the global scale, but it is local measures that are potentially more meaningful and actionable. The impact of some issues, however, may only be evident globally, e.g. global warming and ozone depletion, whereas the solutions may be local.

Henderson[11] has written extensively on indicators, notably the chapter in *Paradigms in Progress* (Chapter 6). The proliferation itself of indicators is indicative of the confusion and uncertainty of what is to be measured, and perhaps the absence of debate and understanding.

Economic Indicators

There is much dissatisfaction with economic indicators, even among economists. Most would claim that they are not indicators of anything other than the economy. Some do not believe they are even meaningful measures of economic sustainability.[12]

The adherents for the most common indicator, the gross national product (GNP), now replaced by the gross domestic product (GDP), are getting fewer, but it is still widely used. Daly and Cobb[13] have developed the Index of Sustainable Economic Welfare (ISEW), which has recently been further refined as the 'genuine progress indicator' (GPI) by Cobb *et al.*[14] Consumption is still the base of the index, but instead of adding negative or deleterious consumption (e.g. defence, environmental protection) it subtracts them and adds previously unmeasured positive beneficial consumption (e.g. voluntary work, caregiving, housework). Whereas the GDP in the United States has continued to increase since 1950, the GPI shows a steady decline which mirrors people's experiences and perceptions of their well-being.

The GPI is a more realistic alternative to the GDP. The proponents of GPI presumably believe it is more likely to receive establishment endorsement by starting from the received wisdom. It is worth pointing out, however, that 50% of Americans consider themselves to be overweight, that 40% consider they consume alcohol in excess of 'moderation', that 70% of smokers would like to stop, and so on with gambling and credit card use. In other words, most of us are knowing victims of the consumer society and would like to change. Therefore, it is difficult to conceive how any index which has consumption as its base can be a measure of sustainability.

Furthermore, the GDP and the GPI are single indices. Both are aggregations of specific economic indicators. Whereas economic indicators may be equally responsive, in respect to time, to actions of adjustment, or can be meaningfully weighted in their aggregation, this is not true of social, environmental and sustainability indicators. Economic indicators are therefore not particularly useful as measures of sustainability, but economic considerations need to be factored in.

However, the very foundation of modern economic theory is suspect. Firstly, because it determines rather than reflects political and cultural development. Secondly, because it assumes scarcity of resources, most of which, until relatively recently at least, are in abundance. An economic theory that goes beyond greed and scarcity and which reflects human needs as suggested by Lietaer[15] is likely to yield much more useful indicators.

Social Indicators

There are broadly five types of social indicators: informative, predictive, problem oriented, programme evaluative, and target delineation. Many social indicators are in part economic, environmental and sustainability measures too. They can be comparative, between and within socioeconomic and ethnic groupings.

Objective conditions, such as the standard of living, are measured by analysing time-series information on observable phenomena. Subjective conditions, such as quality of life, are measures of perceptions, feelings and responses obtained through

questionnaires with graded scales. It is well known that there is little correlation in the level of well-being as measured by objective parameters on the one hand and subjective parameters on the other. There are considerable difficulties associated with the aggregation of indicators and in the design of weighting schemes. There can be aggregation of indicators of a similar nature, but in general aggregation, and certainly a single index, is uncommon.

Henderson[16] reviews the debate about indicators of progress suggesting the need to clarify the confusion of means (i.e. the obsession with economic growth) and ends (human development).

Environmental/Ecological Indicators

Environmental indicators tend to relate to the environmental sphere closest to human activity and can include economic, social and sustainability parameters too. They measure the quality of the living and working environment, usually for the three spheres of air, land and water, and may include measures of our productive use of resources, e.g. agri-environmental indicators. Ecological indicators relate more to ecosystems, where in some cases the human impact is not so evident. Indicators pertinent to the integrity of ecosystems and biodiversity are prominent. The OECD produced a pressure/state/response model which many countries have used in the preparation of their State of the Environment Reports, whilst focusing on their particular environmental/ecological issues.

Most of the indicators have, or will have, thresholds and targets. There is little desire or attempt, at present, to aggregate indicators or derive a single index.

Ecological Footprint

The ecological footprint is a useful measure for urban societies and industrialised countries, as they have become distanced from and are less aware of their dependence on the products of the land. It is a method for estimating the area of productive land required to produce the materials and energy required to support and to absorb the wastes generated by the present way of life. The average North American needs around 4 hectares to support his or her lifestyle. Vancouver depends on an area 24 times its size, and the Netherlands (as a small densely populated country) 14 times. If the rest of the world were to support such lifestyles we would need a planet with five times more productive land than it actually has.[17]

The footprint is an input/output measure of consumption, technological activity, and trade flows of all biophysical material needed by and produced by that city or nation expressed in terms of productive land area but using monetary conversions. It is a single index. Small cities or countries highly dependent on external flows (i.e. exports), and with little influence over international currency fluctuations, such as New Zealand, would have footprints highly susceptible to factors beyond their control. Footprints put relative numbers on what we already know or suspect, that cities and small densely populated countries are unsustainable. The footprint may be useful for internal and temporal reference, but there could be a tendency to compare

performance against other cities or countries and perhaps provide an excuse not to take appropriate action. Ecological footprints are therefore not particularly useful measures of sustainability.

Sustainability Indicators

Measures of sustainability at present tend to be an amalgam of economic, environmental and social indicators. The first two are amenable, but with difficulty, to quantitative measurement as they can be expressed in biophysical terms. There is a tendency to express social indicators in such terms too, but with less success. There is therefore a tendency to see sustainability only in biophysical terms.

Examples of sustainability indicators for a city and which reflect their origin in other indicators are:

1. income per capita ratio for upper and lower deciles;
2. solid waste generated/water consumption/energy consumption per capita;
3. proportion of workforce in the employ of the top 10 employers;
4. number of good air quality days/year;
5. diversity and population of specified urban fauna (particularly birds);
6. distance travelled on public relative to private transport per capita;
7. residential densities relative to public space in inner cities;
8. relative hospital admission rates for selected childhood diseases; and
9. proportion of low birth weights among infants by income groupings.

Boswell[18] advocates a theoretical basis for indicators of sustainable development based on our knowledge of sociology and ecology. He likens our stage of development to that of a climax community within an ecosystem succession. He then presents system attributes (energy use, community structure, life history, nutrient cycling, selection pressure and equilibrium) in terms of goals for sustainable communities. These number 23 necessary but not sufficient conditions. Boswell evaluates these goals against the indicators selected by Sustainable Seattle[19] and the ranking that Hart[20] has given over 500 indicators. Although an approach based on human ecology is clearly appropriate, Boswell does concede that the communities themselves should determine the strategy and the indicators.

Whereas these are facets of sustainability, we must look beyond conventional measures to include a sense of quality of life, well-being, belonging, relatedness, and harmony. We may have to be prepared to accept semiquantitative and even qualitative indicators.

Environmental and social indicators are rarely expressed as a single index. Nevertheless, there is some interest in developing a single index of sustainability based on a weighting of a selection of economic, environmental and social indicators. Such an index cannot possibly cater for response times that range from a few years (e.g. medical intervention) to generations (e.g. global warming).

Criteria for the Selection of Sustainability Indicators

The monitoring of sustainability is a long term exercise. As much as we would like the criteria for selection and the indicators themselves to be appropriate over a long time frame we are on a steep, and perhaps long, learning curve. We will need to be flexible, for our ideas and preferences will change with time. The criteria and preferred indicators could be different for the groups who will choose and use them. Expert systems may be appropriate.

Professionals may prefer quantitative, and if necessary, complex criteria that are amenable to rigorous statistical analysis. Some may wish to reduce a large group of indicators to a single index of sustainability. Communities on the other hand may prefer, or be prepared to accept, qualitative criteria and few indicators in the interests of simplicity and direct relevance. If we exclude qualitative criteria because they are not readily amenable to objective analysis we are likely to exclude some essential features of sustainability.

There are many sets of criteria (e.g. Liverman,[21] Sustainable Seattle). They range from the simple (the efficiency, equity, integrity, manageability of Opschoor and Rejinders)[22] to the complex. Hart believes that the best measures may not have been developed yet but suggests the following criteria:

1. multidimensional, linking two or more categories (e.g. economy and environment);
2. forward looking (range 20–50+ years);
3. emphasis on local wealth, local resources, local needs;
4. emphasis on appropriate levels and types of consumption;
5. measures that are easy to understand and display changes;
6. reliable, accurate, frequently reported data that are readily available; and
7. reflects local sustainability that enhances global sustainability.

Many of these criteria are short on human or social criteria, such as quality of life, sense of safety and security, sense of relationship to others and our connectedness with the Earth. A criterion that doesn't appear to be mentioned is one that reflects the degree of choice an individual has in an action. Most of us are locked into systems of our own collective construction within the dominant paradigm, many of them unsustainable, where the choice to be different can be socially, economically and practically difficult. Examples include the use of solar radiation and rainfall upon one's own house, and the choice not to own a car. Much more sustainable actions could result where the individual can make choices free of systemic pressure and economic distortions.

Risk Analysis and Comparative Risk Assessment

As in all theatres of qualitative and insufficient or imprecise quantitative information and uncertainty, where much is at stake and there may be several options for action,

risk analysis can help in selecting the preferred, the least cost, and/or the least risk option. The poorer the information and the greater the uncertainty, the more risk analysis may need to be used. At a time when we are confronted with a whole barrage of different issues and problems with insufficient resources, a prior analytical stage has emerged—that of comparative risk assessment. This technique ranks the issues/problems according to the urgency, cost and likelihood of success. The proceedings of a conference to debate, and no doubt advance, the technique presents just as convincing arguments against comparative risk assessment as it does for.[23]

Too often we argue we have insufficient information, or inappropriate information, upon which to take sound objective action, particularly action affecting sustainability. Yet in our hearts we know there are systemic functional deficiencies, both within ourselves and in our organisations. Rather than make a personal, corporate or political decision we call for more information, for more research. We prevaricate. Too often that information or research adds to the uncertainty or controversy. Valuable time is lost and yet more unnecessary work is embarked upon. We know the direction our action should take even though we do not know precisely what it should be. We lack the collective will to do so because we do not collectively address and own the problem. Much publicly funded research and development is a surrogate for social action. Many of the problems and solutions are neither technical nor entirely rational. A new mythology needs to emerge and that may be sustainability.[24] They are soluble only through social action, where the populace as well as the technical experts become informed on the issues and make informed recommendations to the decision makers.

Limitations of Measures of Sustainability

Even though we cannot define sustainability objectively and unambiguously, we should not abandon or defer attempts to measure it. Even if we come to recognise that there are other equally valid ways of learning, we have to start where we are, which is within a highly reductionist, rational, material, and acquisitive world.

We can define limiting aspects of sustainability (e.g. the sustainable productive capacity of a specific area of land, or the carrying capacity of the world) and trends in the direction of sustainability (e.g. greater use of public transport, more equitable distribution of income) and choose indicators that are appropriate and meaningful. The former would be thresholds below which we enter an unsustainable state. The latter would be directions in which we need to move. Many in fact are really indicators of unsustainability. Many debates and studies about the measurement of sustainability do not define, or even derive a common understanding, about what is to be measured. The context of sustainability cannot be separated from its measurement.

We should acknowledge at the outset the limitations of quantitative measures and that any measures are merely *the finger pointing at the moon* (a Zen saying). But we must be on our guard to keep well clear of thresholds. Surplus 'capacity' may be a spur to further inane growth and consumption. International trading in sustainability units could mean we all arrive at global survival (not sustainability) together. Biophysical measures are really measures of how close we are to the carrying capacity of

the Earth. Thus, biophysical measures are only indirect, partial and limiting measures of sustainability.

Even though sustainability is about the quality and other intangible non-physical aspects of life, that does not mean we may not be able to derive measures for them. Just as biological indicators (e.g. trout) are now used to measure the quality of industrial effluents, in addition to conventional chemico-physical indicators, we should be able to derive parameters that measure how well we and the Earth are as we swim around within the maelstrom of life.

Initiatives to Measure Sustainability

Sustainability indicators are being developed and applied at the grassroots level—the communities themselves, e.g. Jacksonville, Pasadena, Seattle in the USA, and at the institutional level in Europe, and North America. These indicators tended initially to be a potpouri of the three types above and there are still resemblances. As communities learn from the experience of others more appropriate and community-specific indicators should emerge.

The most promising of overseas initiatives to monitor sustainability are those that the public have initiated, and who largely retain 'ownership' and control, e.g. Sustainable Seattle—despite the fact that only eight of the 40 indicators have shown some improvement. Technically they may be flawed, but the success lies not in the indicators themselves but in the process and the participation, for it is here that the real debate and the sharing occurs and the mutual voluntary adjustments can be made. There is a limit, however, to the extent to which individual voluntary adjustments, or pressure for collective adjustment, can be made when our attitudes and behaviour may have been shaped more by the nature of our society (our systems of governance and organisation) than from free choice. In other words, if systemic change (e.g. to our economic system) is needed, it may be easier and quicker if it is effected by those with the power and influence.

The discourse of sustainability is part of the process of working towards sustainability. We will find we will know we are becoming more sustainable without having to measure it. Part of that discourse will be measures of sustainability, both the relatively easy that measure proximity to thresholds and directions, and the qualitative. But they will be consequential, for the hard graft of achieving sustainability will have begun. Therein lies the success of initiatives like those in Seattle.

The commencement of that discourse is the challenge. It is already in progress within NGOs and environmental and social change groups, but they may not see their particular window of interest as progress towards sustainability.[25] The discourse needs to be extended to the community at large, to local communities, to open debate of the big issues ahead of us, and to a more effective and participatory democracy. Local communities need to renegotiate the meaning of community in the modern world and find avenues for expression. Citizens' juries and consensus conferencing are great vehicles for exploring these deep and wide issues.[26]

Conclusions

1. There is growing acceptance for the concept of sustainability despite our inability to objectively define it and therefore to implement it.

2. Sustainability is more than ensuring ecological integrity and the standard of living. It is about the quality of life and thus addresses the ultimate questions about meaning in life.

3. Sustainability is as much a process of discourse and effort as it is a state.

4. Institutional initiatives and debates about measuring sustainability are reluctant to engage with the concept of sustainability. Thus, there is no common or shared understanding of what is to be measured.

5. Sustainability indicators are often an amalgam of economic, social and environmental indicators, but show signs of maturing into better measures of sustainability.

6. Such indicators, however, are limiting measures reflecting unsustainability and survival rather than sustainability. Their main value is in indicating direction of change rather than a desirable state.

7. Indicators are the map, not the territory (the finger pointing at the moon). The hard work of achieving sustainability lies elsewhere.

8. The most successful initiatives to measure sustainability are those initiated and controlled by autonomous public groups (e.g. Sustainable Seattle), where the process is more important than the indicators.

9. The greater the effective participation in democracy, in executing the role of community, in consensus conferencing, in citizens' juries, etc., the more chance we have of achieving sustainability.

10. We will need to address the fundamental existential questions and seek meaning in life if we are to achieve sustainability. As we seek to measure sustainability we should be asking ourselves how we ourselves measure up to sustainability.

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Conserving Biodiversity

Biodiversity preservation is becoming a growth area for anthropologists. Ben Orlove sets the theoretical stage for these examinations by noting the importance of political economy to ecological studies. Orlove thinks about how conflict and certain kinds of decision-making shape the physical environment. Writing in 1980, Orlove challenges anthropologists to include social processes and individuals as active agents in their interactions with nature.

Anthropological research on biodiversity preservation largely has followed Orlove's path. In this section, Hill and Haenn look at biodiversity conservation from global and local perspectives. Hill describes the opposing priorities of national governments and nongovernmental groups in negotiations to regulate trade in elephant ivory. Haenn reviews local reactions to a Mexican biosphere reserve to demonstrate how protected area models both contradict and complement local ideas of land management.

Throughout the world, protected areas, including national parks, have been the chief tool of biodiversity preservation. Recently, parks have been criticized as colonialist models imposed by outsiders on local people. In this section's polemical piece, Kent Redford, Katrina Brandon, and Steven Sanderson, writing in association with The Nature Conservancy's program to support park operations, make the case for the enduring relevance of protected areas. Michael McRae reports on sales of primates in Africa for meat and pets. McRae's graphic descriptions raise important ethical considerations for the human species, which has driven its nearest evolutionary kin to the brink of eradication. McRae's report on the dual effects of logging (for export) and hunting (for national consumption) on primate populations recasts the connections between global consumerism (see Section 7) and local demographics (see Section 2).

This section also includes a brief selection of Arturo Escobar's writing, which challenges us to see biodiversity itself as a cultural product. While not explicitly a reflection on the ethics of species loss and biodiversity protection, Escobar's writing leads readers in two directions for ethical consideration. The first direction is the extent to which language shapes our notions of right and wrong and even the existence of an object worthy of ethical consideration. The second direction is the question of to whom natural resources belong and who is responsible for their future? As ethical writers throughout the reader imply, questions such as this go beyond merely figuring out the mechanics of environmental management. They also impinge on the construction of a community around those resources that agrees to regulate resource use in a way that is generally fair to all members of that community.

Chapter Nineteen

The Third Stage of Ecological Anthropology
Processual Approaches

Ben Orlove

In contrast to the work of Steward and White and the neoevolutionary and neofunctionalist schools, a third set of approaches in ecological anthropology has begun to emerge in recent years. The research that is being carried out cannot be characterized as strongly as in the two previous stages as sharing a large number of assumptions, but it does question the neofunctionalist approach along the lines indicated above. This work will be called "processual" ecological anthropology. The use of the term "process" has been used earlier by other writers (6, 53, 57, 61) to refer to the importance of diachronic studies in ecological anthropology and to the need to examine mechanisms of change. However, the term "processual ecological anthropology" to describe current developments in the field does appear to be new. Important trends are (*a*) the examination of the relation of demographic variables and production systems, stimulated in part by Boserup's work (16); (*b*) the response of populations to environmental stress (81, 92, 93); (*c*) the formation and consolidation of adaptive strategies (10–12, 14, 22, 23) which follow Barth's early work on the use of the concept of the niche (2); and (*d*) new work in Marxism, including the emerging interest of anthropologists in political economy and structural Marxism. The studies are called processual because they seek to overcome the split in the second stage of ecological anthropology between excessively short and long time scales (5, 29–31). More concretely, they examine shifts and changes in individual and group activities, and they focus on the mechanisms by which behavior and external constraints influence each other. These points indicate the importance of the incorporation of decision-making models into ecological anthropology. Like the neofunctionalist and neoevolutionist ecological anthropology, processual ecological anthropology examines the interaction of populations and environments (26) rather than treating the latter as a passive background to the former. There are strong parallels between processual ecological anthropology and current work in biological ecology; the nature of these resemblances is the subject of some analyses which seek to link anthropology and biology in a more rigorous manner than has previously been the case.

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Actor-Based Models and Processual Ecological Anthropology

A major influence on the processual ecological anthropology is the actor-based models which have received general interest in social anthropology. The literature on these models is large and diverse; one particular focus, decision-making models, will be emphasized here. The actor-based models form part of a general shift in postwar anthropology in both Britain and the United States from social structure to social process, from treating populations as uniform to examining diversity and variability within them, and from normative and jural aspects to behavioral aspects of social relations. Firth's (32–34) distinction between social structure and social organization is a major point of departure. He underscored the importance of variability in decision making and individual behavior, and demonstrated that many social systems contain options among which individuals must choose.

The actor-based models have several advantages: they account for a wider range of social organization than previous models do; they permit a more precise analysis of the parameters of behavior and the variation of behavior within populations; they admit more readily an examination of conflict and competition; and they offer the potential of examining change through an analysis of the processes which generate economic, political, and social relations. One important aspect of actor-based models is decision-making models, which may be loosely divided into two types: cognitive or naturalistic models and microeconomic models. These types are not necessarily opposed, as attempts at synthesis (24, 48) show; they remain, however, largely distinct. The former, borrowing from cognitive anthropology, attempt to depict actual psychological processes of decision making by locating the cognized alternatives and the procedures for choosing among them. Quinn (74, p. 42) distinguishes within these among "information processing models," "retrodictive models," and "models of cultural principles." These types all tend to be employed to analyze contexts in which individuals must select among a small number of alternatives, often on the basis of consideration of social status. Postmarital residence and adoption are common topics. These models offer useful links between studies of native systems of classification and actual behavior; such ethnosemantic models have been developed for the planting decisions of Brazilian sharecroppers (50–52) and the marketing decisions of West African fish vendors (37). These models often are applied to situations in which alternatives are finite and may be distinguished by discrete rather than continuous variables. The parameters which affect the choices tend to be few in number, and the outcomes of choices are certain, or nearly so.

The microeconomic models resemble economic models of choice making. Actors operating under a set of constraints allocate scarce resources to a hierarchical series of ends or goals. Many such models assume that actors attempt to maximize some valued state, although some authors have proposed more complex models of optimizations such as "satisficing," minimax strategies, and hierarchies of strategies (8, 84). In this fashion they avoid the rigidities often attributed to models of rational actors (46). There is a large concern with the *outcome* of the decision and less emphasis on the *process* of decision making. These models are applied to situations with greater uncertainty and ambiguity, where the range of alternatives and the outcomes of choices

are less well defined. The alternatives may be distinguished by continuous as well as discrete variables, and many parameters may influence them. Barth's (3) efforts at generative models of social organization are an example of such work. Borrowing from game theory, he attempts to explain political organization among Pathans as a structure which had emerged from a large number of individual decisions made by actors operating under different constraints. Ortiz's (71, 72) studies of planting and marketing decisions by small-scale farmers in Colombia are another example. Although these models can be criticized for taking the goals and constraints as givens and failing to examine the patterns of resource distribution, they have been of considerable use in anthropology as in political science and economics.

The potential links between ecological anthropology and actor-based models are strong, but they have not been utilized extensively. Ecological anthropology, particularly in its first two historical stages, emphasized the importance of environmental factors in shaping collective patterns of behavior. The neglect of the examination of individuals which this focus has often produced may be explained in part by the repudiation of the examination of individual actors by early ecological anthropologists (97) and in part from the neofunctionalist and neoevolutionist emphasis on systems in which aggregates and aggregate variables were accorded more importance than individuals. Conversely, actor-based models have tended to treat environmental variables as part of a relatively static set of external constraints to which individuals respond and adapt. This tendency is particularly strong in studies which focus on small areas in short periods of time. They have thus omitted some of the concerns of ecological anthropology. Despite the lack of effort in this direction, ecological anthropology can offer actor-based models a richer understanding of the dynamic that operates within the system of constraints; and actor-based models can permit ecological anthropology to examine the proximate factors which influence the behavior of individuals and of aggregates. The integration of the two is particularly favorable to the processual studies in ecological anthropology; the ecosystem and decisions made by individual actors affect each other reciprocally.

Components of Processual Ecological Anthropology

Demography. Demographic decision-making models are closely tied to the specific trends in processual ecological anthropology mentioned earlier in this section. They bear on the recent work in demography and anthropology which has contributed to processual ecological anthropology. Neofunctionalist work emphasized negative feedback mechanisms which maintained populations at static levels: neoevolutionists looked at the broad details of human demographic history, and often missed the details of particular cases.

A seminal work in this field is Boserup's *The Conditions of Agricultural Growth* (16). Her well-known hypotheses reverse Malthusian descriptions of human demography to suggest that population pressure causes rather than follows agricultural intensification; people shift from more efficient extensive systems to less efficient intensive ones only when driven by the necessity of feeding more individuals. The general

outlines of her argument and the details of her sequence of stages in agricultural intensification have attracted a great deal of attention. Many authors have pointed out the shortcomings of her excessively simple scheme, and indicate that other factors can also influence the sequences of agricultural intensification; these include market systems, political pressures, and environmental variables. Boserup's work and studies by Spooner (86) and others (4, 7, 13, 22, 28, 39, 44, 45, 62, 63, 89, 96) stimulated by it may be classified as processual, for several reasons. The effort to assess the links between population pressure and agricultural intensification have led to diachronic studies (62) in which changes in single groups are traced through time; research in other areas for which little historical reconstruction is possible has been carried out by examining the covariation of population density and agricultural intensity (19), with the assumption that current distribution of associations resembles past sequences. The studies often rest on an implicit decision-making model in which actors actually allocate scarce resources (labor) in order to achieve goals (food production). The mechanisms of change are seen in the connection between population and resources, linked through systems of agricultural production and the necessity to feed local populations. Individual decisions have cumulative consequences which lead to broader change; shortening of fallow periods may lead to a shift from communal tenure to private property, for instance. Other work links demographic and ideological change (9).

Environmental Problems. Vayda & McCay (92, 93) argue that the literature on the response to environmental problems is an important shift away from the strong focus on energetics and from the assumption of stable equilibrium; as they show, it also permits an examination of individual as well as population responses to environmental forces. Waddell's (94) work on the response of the Fringe Enga in highland New Guinea describes three types of responses to three levels of frost intensity and duration, with larger (though still subpopulation) sets of individuals acting in cases of more severe potential or actual damage to crops. Earlier work by Vayda (90, 91) and others (43) on the nature of warfare and the choice of different forms of attack rather than other responses to certain situations similarly makes the point that the nature of the response can be correlated with the scale of the problem. Other works show that responses can vary on individual as well as collective levels to natural stresses such as storms (7), droughts (57, 66, 73, 76), famine (54, 70), and earthquakes (65). Laughlin's (55, 56) well-documented analysis of the responses of the So in East Africa to periodic crop failures is another good example of use of decision-making models and the analysis of environmental problems. Britan & Denich (18) address similar issues in Newfoundland and Yugoslavia in cases of secular rather than cyclical change. Some efforts (64) have been made to quantify environmental hazards.

Adaptive Strategies. The notion of adaptive strategy follows closely from that of decision making. The idea of adaptive strategy suggests that individuals, by repeatedly opting for certain activities rather than others, construct alternatives which others may then choose or imitate. It is also congruent with the emphasis on strategies and fitness in evolutionary biology (88). A focus on adaptive strategies leads to an examination of the manner in which a larger number of choices made by individuals can

influence the wider setting (14, 24, 59, 85, 87, 95, 98). Rutz's (78) analysis of household decision making in a Fijian valley, for instance, shows the unplanned village-level consequences of interaction between households and their resolution of competition over different types of land. McCay (61) examines two types of adaptive strategies among Fogo Islanders as responses to a period of decline in the nearby fisheries. Individuals and households may adopt "diversification" and "intensification" responses, and the latter in particular led to outside intervention by governmental agencies, which made the environmental problems more severe. The concept of adaptive strategy, however, is often more elusive than one might suspect, as suggested by definitions such as Bennett's (10, p. 14): "the patterns formed by the many separate adjustments that people devise in order to obtain and use resources and to solve the immediate problems confronting them." The issues of the consciousness of the adaptive strategies and the ease with which they may be adopted are often not wholly confronted; the same work by Bennett on a region in the Canadian Great Plains recognizes four strategies (rancher, farmer, Hutterite, Indian) but does not fully examine the consequences of the fact that it is easier for farmers and ranchers to shift between those two strategies' than to adopt the Hutterite or Indian one.

Marxism. It is at this juncture that the contributions of Marxism become evident. The important role of Marxism in the two earlier stages of ecological anthropology makes its contributions in the third stage appropriate. If adaptive strategies are seen as the outcome of decision making, or repeated allocation of scarce resources to a hierarchy of goals under conditions of constraint, then it is necessary to examine the pattern of resource distribution and the source of the goals and constraints. This is precisely the contribution of recent work in Marxism, including much structural Marxism (15, 36, 38) and the new political economy. In particular, a reconsideration of the notion of mode of production questioned the rigid sequence of succession of modes and the determination of the superstructure by the base (47, 58, 68), paralleling a rejection of neoevolutionism and neofunctionalism. Dependency theory raised similar issues on the relation of economics and politics and suggested the importance of an examination of world systems. This work is compatible with the emerging interest in political economy within anthropology (1, 20, 25, 40, 42, 49, 60, 67, 77, 82, 83), the concern for a historical materialist perspective (27), and an emphasis on the links between local populations and wider systems (17, 21, 79), including regional studies (6), studies of complex society (99), and a world-systems perspective (69). This work thus contrasts with the neofunctionalist ecological anthropology, which often adopted the local population as its unit of analysis. For a structural Marxist critique and reply, see (35) and (75). Each social formation may be seen as having a characteristic set of forces and relations of production and an associated superstructure. This social formation is pushed toward transformation by conflicts within the base, between the base and superstructure, and between the social formation and its wider natural and social setting. Any social formation is a transformation of the ones that preceded it. This criticism is similar to the one made by Sahlins, that ecological anthropology reduces culture to "protein and profit" (80, p. 45), that it misses the fact that activity and ideology form a coherent structured whole of meaning and its expression. This

criticism also attacks the lack of satisfactory treatment of the mechanisms which generate human behavior on the part of many neofunctionalists and neoevolutionists.

Conclusions

Processual ecological anthropology is a reaction to neofunctionalist and neoevolutionary approaches, which were also responses to the pioneer work of Julian Steward and Leslie White. Adopting an historical time frame, rather than examining synchronic homeostatic equilibria or the many millenia of human history, permits a closer focus on mechanisms of change. By studying units other than the local population on which the neofunctionalists concentrated, studies have been carried out of larger units (political economy) and smaller ones (actor-based models). The elimination of functionalist assumptions has had several consequences: (*a*) a focus on the mechanisms which link environment and behavior; (*b*) an ability to incorporate conflict as well as cooperation by recognizing that not all goals are population-wide; (*c*) more precise studies of productive activities, settlement patterns, and the like without assumptions about equilibrium maintenance.

Processual ecological anthropology draws on several recent trends in the social sciences: demography, an examination of environmental problems, the concept of adaptive strategies, and recent work in Marxism. Decision-making models link all of them. The gap between anthropologists and biologists is also narrowing, as specialists in each field become more aware of work in the other and have begun efforts to link the two theories (as in dual inheritance approaches) and to borrow more cautiously than in the past. The homologies between actor-based models and natural selection favor this connection between sciences without assuming that they are virtually identical as the sociobiologists do, and the ecosystem ecologists, neofunctionalists, and neoevolutionists did.

The incorporation of decision-making models as mechanisms of change has led to a greater emphasis on social organization and culture. Social and cultural systems influence the goals which actors have, the distribution of resources which they use, and the constraints under which they operate. It appears likely that the comparative work in ecological anthropology will emphasize culture areas, as in the Pacific, European, Mayan, and Andean cases mentioned here, as well as the comparisons of evolutionary stages and production types which characterized the neofunctionalist and neoevolutionary stages. As this work progresses, materialist and idealist approaches in anthropology are likely to find more common ground through a more thorough interpretation of culture and ideology as systems which mediate between actors and environments through the construction of behavioral alternatives.

As ecological anthropology draws closer to biology and history, it becomes enriched and enriches other fields. Although it incorporates models and research methods from other areas of anthropology and other disciplines, it must rework them to suit its own needs rather than adopt them blindly. This association with other fields, however, creates the danger of a fragmentation of ecological anthropology into a series of specialized areas of inquiry. The current diversification, though it shows a growth

of new lines of productive research, could lead to a loss of analytical coherence. An examination of theoretical issues and of the complex history of the field is therefore an urgent task. Future developments in ecological anthropology thus rest on an understanding of the new common elements in processual approaches—the importance of the time frame, the role of actor-based models, a clearer focus on mechanisms of change, and a more balanced position on the role of social organization, culture, and biology.

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Conflicts over Development and Environmental Values

The International Ivory Trade in Zimbabwe's Historical Context

Kevin A. Hill

The Colonial Legacy of Conservation in Zimbabwe

Beginning with the establishment of the settler colony by Cecil Rhodes' British South Africa Company in 1890, the African population of Zimbabwe endured land alienation unsurpassed in its scale anywhere on the African continent. Through legislation and taxation schemes, rural farmers were either forced into the growing mining economy of the colony or into marginal, fragile scrub and dustland farming areas. Indeed in 1991, over 100 years after the Pioneer Column established Salisbury, 40 per cent of Zimbabwe's arable land is still held by less than 1 per cent of the population, most of whom are descendants of the settlers. But taxation and Colour Bars were not the only schemes used by the various colonial regimes to take the best land for themselves; wildlife preservation schemes also led to land alienation, and created a hostility to wildlife conservation among local people that still must be battled today.

Not only were rural farmers moved off the best land; they were also prohibited from hunting wildlife on the meagre lands allocated to them (IUCN, 1988). In pre-colonial days (before 1890) wildlife probably survived because of low human population density, and because people utilised wildlife sustainably as a food resource (Taylor, 1992). The last of the Ndebele kings, Mzilikazi and Lobengula, attempted to limit European hunting in their territories. Lobengula explicitly banned the hunting of female elephants and the gathering of ostrich eggs, and tried to restrict white hunters to certain ranges, and charged trophy fees (Thomas, 1991).

Suddenly, with the advent of white settler colonialism, the Rhodesians became the gamekeepers, and the Africans the poachers. Whereas the local people had once hunted game both for food and ritual, what had once been a practice of everyday life now became illegal. They were even barred from killing elephants and other dangerous animals which threatened their crops. Thus, rural farmers had to suffer the

consequences of living with wildlife while reaping no benefits from them, and having no say in their management. In this atmosphere of conflict and obvious lack of concern by the authorities for creating truly meaningful grass roots participation in conservation programs, rural farmers would rather be rid of wildlife than tolerate its presence; consequently, the conservation message had little meaning to these people (IUCN, 1988). Indeed, evidence of this attitude persists today. In a baseline sociological study of Chapoto Ward in northeastern Zimbabwe, researchers found that 84.8 per cent of respondents said wildlife had no value to their households whatever.

The Transitional Period: 1980–1981

According to Shadrack Gutto, former lecturer in law at the University of Zimbabwe: 'conservation is a religion through which a wealthy elite worship nature' (*Zimbabwe Wildlife*, 1989, 22). In the Zimbabwean context, the word 'whites' could safely be substituted for 'a wealthy elite.' The history of wildlife conservation does carry elements of racism, particularly the early land conservation laws. This legislation left an anti-conservationist legacy among local people, to which Dr. Callistus Ndlovu, MP, referred in Parliament in 1981:

> let me say that during the struggle for independence, and in fact as far back as the 1950s, there was a great deal of resistance from the African population to any conservation programme. This was not because the African majority was opposed to conservation as a principle, or as a means of preserving the natural resources of this country. It was in part their political resistance. I say this, because at a certain point in time, those of us who were involved in the struggle for independence did encourage people not to cooperate with certain programmes for conservation, and thus might have created an impression not only among our own supporters but also among those who are charged with this responsibility that we are not interested in conservation (Parliament, 1981, 943).

In independent Zimbabwe, these attitudes still affect the policy environment in which any conservation programme must operate. Immediately after independence in 1980, a wave of elephant poaching swept the communal lands and national parks. According to one game warden, as much as 90 per cent of this poaching was not for ivory, but because the preservation of wildlife, especially those in the national parks, was associated with white rule (Timberlake, 1985).

This suspicion of conservation on racial grounds has carried over into the governmental attitude toward NGOs and to some conservation legislation. One example of the latter is the debate over the Natural Resources Amendment Bill in 1981. Part of this bill sought to curtail the authority of the Natural Resources Board, an advisory board to the Department of National Parks traditionally dominated by whites. Previously, the NRB had the authority to block large public works projects if they were deemed by the Board to be harmful to the environment, under the Native Land Husbandry Act of 1950. In an act of mistrust, the amendment took this power out of the hands of the NRB, because, the Minister of Natural Resources and Tourism said, '[such power] could be obstructionist to development in areas neglected by previous governments'

(Parliament, 1981, 1564). Further, the nature of relations between Government and Zimbabwean conservation groups is tainted by the dichotomous racial makeup of the two parties. This was noted in a December 1987 editorial by veteran conservationist Dick Pittman, who said:

> let's be quite blunt; we only have to look at the ethnic composition of most voluntary [conservation] organisations to recognise that we may be in danger of becoming irrelevant. (Pittman, 1987, 5)

Indeed, of the ten members of the Zimbabwe National Conservation Trust coordinating committee who represent conservation NGOs, as late as 1989, all ten were white.

Clearly, then, whites retain a more obvious interest in conservation issues than do black elites and, by association, the millions of black rural farmers. This situation, and the historical reasons for it, certainly serve to constrain successful implementation of any conservation scheme, and inhibits the establishment of popular participation in conservation and human-wildlife relations.

The Contemporary Legal and Institutional Setting

The Parks and Wildlife Act of 1975 serves as the basis of contemporary Zimbabwean wildlife policy. As of 1993, wildlife generated US$60 million in tourism for the Zimbabwean economy (Taylor, 1992). Although not an insubstantial figure, this amounts to less than three per cent of Zimbabwe's GDP. Thus, wildlife policies which depend only on tourism and parks are probably not economically tenable. Recognising this fact, the Zimbabwe National Conservation Strategy of 1987 states:

> wildlife and protected areas are accepted as renewable resources that can and should be used correctly on a sustainable basis for the benefits of both the people and the resources. These benefits may take aesthetic forms such as scientific, cultural, and recreational values, or they may take material forms such as enhanced productivity from land. (Government of Zimbabwe, 1987, 4)

The Wild Life Estate—National Parks, Safari Areas, Recreational Areas, and Botanical Reserves—covers 12.7 per cent of Zimbabwe's land area. In addition, DNP is given oversight status for those commercial farms and ranches which have wildlife populations, and the wildlife in communal areas. Thus, the potential jurisdiction of the DNP is quite large, and this part of government is potentially a very powerful entity. The Parks themselves allow absolutely no consumptive use, and are based on the preservationist motivation so pervasive amongst environmentalists in the North. The Safari Areas cover almost as much acreage as do the National Parks, and are usually contiguous with parks. They allow camping, hiking, fishing, game viewing, and of course licenses hunting of plains game and big game—elephants, lion, buffalo, and leopard.

In its 'Policy for Wildlife', the government of Zimbabwe recognises that economic returns are an important part of conservation when mixed with the imperatives of economic development (Government of Zimbabwe, 1987). And with a three per cent population growth rate and severe overcrowding of many existing communal areas,

there are likely to be calls for the return of some National Parks and Safari Areas to agriculture. Even the Ministry of Environment and Tourism (MET), the parent ministry for the Department of National Parks, recognises this fact, but presently supports a policy of not opening any parks to agricultural development (Government of Zimbabwe, 1987). Further, with the dwindling of financial resources for the DNP, the complete protection (and even the effective protection of some important areas) may have to be reexamined in the future, given the political imperatives of massive land hunger, and the practicalities of dwindling government expenditure. If government is the only source of income for wildlife conservation, then this situation can only become worse.

The practical policy-oriented task, then, is for government to find alternative means of financing preservationist policies, or to opt for policies that involve the sustainable utilisation of species. Further, given the political culture of hostility to conservation, the successful environmental policy will seek to redress and reverse this opposition to wildlife conservation prevalent in the black population of Zimbabwe. This kind of policy, which Zimbabwe's Parks Act and National Conservation Strategy openly embrace, also has political ramifications. Since wildlife conservation takes place in parks, safari areas, communal areas, and on commercial farms, government must engage a broad spectrum of organised interests with very different motivations and organisational capacities. Before examining Zimbabwe's controversial ivory trade policies, one must come to grips with the explicitly political problems facing any wildlife conservation policy regime in Zimbabwe.

At least three major political problems confront successful sustainable development. First, the differences of access by social groups to the benefits and costs of natural resources will influence the ways those groups perceive the benefits of a given wildlife policy, regardless of its technical and economic merit in the aggregate. Second, the historical polarisation of attitudes toward wildlife between people with a preservationist perspective and those with a socio-economic approach will hinder the successful implementation of Zimbabwe's wildlife policies. In a related vein, the polarisation of attitudes between those 'comfortably concerned with ecosystems and sustainability' (Katerere et al., 1991, 67), and those concerned with their own safety and survival vis-à-vis wildlife will cause obvious problems for the design and implementation of sustainable utilisation policies. Third, the tendency by international agencies and regulatory bodies to impose environmental conditionality on developing nations without a full comprehension of and commitment to the developmental implications of these conditions, will affect Zimbabwe's policies when they interact with the international community.

Forms of International Environmental Persuasion and Regulation

Surely there are many ways for nations and groups of nations to attempt to regulate cross-national or cross-regional environmental problems. John Dryzek's book *Rational Ecology* (1987) is a rich elaboration of the 'social mechanisms' used in the international arena in attempts to regulate ecological integrity. According to Dryzek, the

world has nine major types of social choice mechanisms, existing at various levels: the market, administered systems, law, moral persuasion, polyarchy, bargaining, armed conflict, radical decentralisation, and practical reason. The last two of these are Dryzek's own constructs, but they are elaborated and modelled in a somewhat disappointing manner. Nevertheless, common sense tells us that mechanisms one, two, and three are ubiquitous. The first two mechanisms, the market and systems of administration, are almost always present in any attempt at national or international regulation. While ubiquitous, the market is at its weakest when confronted with rationally regulating common property resources, as discussed above. Further, when theorising about ecological politics and policy, moral persuasion through campaigns mounted by environmental groups has taken on importance, particularly in recent years. When combined with the international components of mechanisms six and seven (bargaining and armed conflict), one can discern an important theoretical interaction between moral persuasion and international bargaining and conflict over ecological problems of transnational scope. This interaction becomes especially politically important when one nation or group of nations perceives its environmental policy interests are in jeopardy. This is precisely the concern expressed by the southern African nations after the 1989 and 1992 ivory bans were imposed against their strenuous objections that such bans were not only unnecessary for their herds, but may actually be injurious to their own countries' ecological integrity, and totally ignore the historical context of wildlife conservation in the region.

The International Ivory Trade: Clashing Values and Historical Contexts

The markets for ivory are mainly in the Far East. The Japanese use ivory to make *hankos*, which are personal seals often used in place of signatures (Bradstock, 1990). Hong Kong, China, and Taiwan also have had extensive ivory carving industries for several centuries. There has also traditionally been consumer demand for ivory in Europe and North America as well, although consumers usually purchased their ivory indirectly, through the carving industries of East Asia.

Most observers agree the population of African elephants has been halved in the past 15 years (Barbier, 1991). What is not commonly appreciated, however, is that the decline of the elephant has not been consistent across the continent. In fact, while Kenya and Tanzania have seen their elephant populations decimated by poaching, the southern African nations of Zimbabwe, Namibia, Botswana, and South Africa have seen their herds grow over that period. Zimbabwe and Botswana claim their elephant herd growth is actually too high, and that if left unchecked, the elephant will destroy its own environment and physically threaten the people living close to them.

Indeed, poaching in eastern and central Africa has been the elephant's major menace[1]. Elephant and rhino poachers in Africa are often armed with AK-47 rifles, chain saws, and even rocket propelled grenades (Booth, 1989). Before Dr. Richard Leakey[2] took over the helm of the Kenya Wildlife Service in 1989, (when he convinced the government to burn $3 million in ivory), corruption was rife in the Kenyan government, with wildlife employees allegedly involved in poaching activities. To compensate,

Kenya called for a total worldwide ban on ivory. Through lectures, television pro-
grammes, and press interviews. Dr. Leakey became a high profile spokesperson for the
worldwide ivory ban in 1989.

Thus, this dramatic policy shift away from government sanctioned (or at least gov-
ernment condoned) poaching to a complete ban on ivory occurred over a very short
period (Morell, 1990). Further, Kenya instituted a shoot-on-sight policy for dealing
with poachers. Zimbabwe has been doing this for over five years (Booth, 1989). In
January 1989, after having seen its herds poached from 300,000 in 1979 to 100,000 ten
years later, Tanzania began to crack down on illegal ivory trading by arresting the Indo-
nesian ambassador, who was caught trying to smuggle 184 tusks out of Dar es Salaam.

The international regime which oversees the trade in species products is the Con-
vention on International Trade in Endangered Species (CITES), which has over 100
members. CITES member nations usually convene every two to three years to con-
sider proposals by members, and to review the level of international protection given
to various plant and animal species. CITES offers three levels of protection for a
species. Appendix One listing includes species threatened with extinction, and pro-
hibits all trade in their products. The elephant has been listed here since 1989. Appen-
dix Two is for 'threatened' species, and international trade in their products is only
allowed with carefully monitored export permits from the producer countries. The
elephant was on Appendix Two from 1974 to 1989. Appendix Three includes species
locally endangered, and the listing of a species here constitutes a request for help from
the host country to save the particular plant or animal. All parties to CITES may take
reservations to listings in these areas, effectively opting themselves out of regulation.

Conflicting Approaches to Saving the African Elephant

After a chilly April 1989 meeting of African wildlife officials on the elephant, CITES
Deputy Secretary-General Jacques Berney neatly phrased this distinction:

> on the one side you have those who believe in conservation, which implies utilisation of
> wildlife as an economic resource [the southern African nations]: on the other you have
> those who believe purely in protection, and their pressure on public opinion in the West
> is enormous … [Kenya and Tanzania]. You have people who would still want to ban the
> ivory trade tomorrow even if there were three million elephants in Africa instead of
> 650,000. (Morrison, 1989, 94)

Of course those who adopted a preservationist stance on the elephant were in favour
of a complete ban on ivory trading, in order to shut down the demand for elephant
products, and thus hopefully save the species. After the 1989 CITES worldwide ban on
the ivory trade was imposed, the east African nations, along with nearly all the North-
ern nations, opposed any reopening of the ivory trade, even a partial one which
would allow those countries who managed their herds efficiently to sell their elephant
products. Even after the total ivory ban of 1989, the CITES Secretariat still acknow-
ledged that Botswana and Zimbabwe had highly successful wildlife utilisation schemes,
which had resulted in rising elephant populations over a period of fifteen years.

The argument that developing nations should be able to profit from their own natural resources was one supported in principle by the World Wildlife Fund at the 1992 CITES meeting, but they continued to voice concern about the free rider problems associated with attempting to police a partial ivory trade. Also, when they speak of sustainable utilisation of big game mammals such as elephants, Western conservationists usually refer to some form of high-priced eco-tourism, in which Northerners pay large fees to African governments for the privilege of viewing the animals in relatively pristine environments (Moffett, 1992).

On the other hand, those conservationists and nations which attempt to practice sustainable utilisation of wildlife view the situation very differently indeed. Zimbabwe and other southern African nations have been highly disturbed by the tendency of Western conservationists to rely on the force of law and the implementation of sanctions to protect the environment. Zimbabwe's philosophy of sustainable utilisation does not rest on enforcement of punitive law or moral persuasion, but on the fact that people who live near wildlife must be given an economic stake in its management (Parrish, 1989). As a result of a safari hunt by one wealthy American businessman, nearly $20,000 was raised for the Dande, Zimbabwe communal land, the area in which the safari took place. Most of the $20,000 trophy fee paid by the hunter built two new school buildings and a health clinic. In 1989, Dande made over $250,000 on carefully supervised elephant hunts; there is no poaching in this area, since local people have a firm economic stake in sustained management of the local elephant population (Morrison, 1989). Zimbabwe's sustainable utilisation philosophy, at least as it pertained to the African elephant, was keeping a comparatively large amount of money in the nation, and thus adding much value to raw ivory. This pre-ban situation accords well with state policy preferences, which seek to keep as much revenue as possible from ivory in country.

The 1989 and 1992 CITES Meetings: Moral and Economic Confrontations

At the October 1989 CITES meeting in Switzerland, a complete worldwide ban on the ivory trade was passed overwhelmingly, the protestations of the southern African nations that they had sustainable programs of elephant culling notwithstanding. Thirty-two per cent of all African nations voted against the ivory trade ban, while 35 per cent of Range states opposed the international ban on ivory. Of the eight range states voting against the ban, five were in southern Africa. The proposal by southern African nations to make an exception to the ban for them was shelved, with further discussion put off until the 1992 meeting of CITES in Kyoto, Japan. In the aftermath of the 1989 meeting, and in the run-up to the Kyoto conference, a war of words between southern Africa on the one hand, and east Africa and Northern environmentalists on the other, escalated to proportions rarely seen at scientific or diplomatic conferences. Recalling Dryzek's distinctions between different forms of social control, these verbal (and increasingly monetary) wars between people with different philosophies toward wildlife conservation are fascinating indicators not only of the importance that environmental protection has taken on in the global debate, but also of the conflict between using moralistic, economic, and regulatory mechanisms to bring about a mutually

desired international policy outcome. After its proposal to market ivory from carefully managed herds was rejected at the 1989 CITES meeting, Zimbabwe was painted by some conservationists in the Northern press as an uncaring conspirator with elephant poachers (Parrish, 1989). Greenpeace further condemned Zimbabwean culling operations, and accused the country of vastly over-counting its elephant population (Contreras, 1991). For its part, Zimbabwe joined in the verbal escalation. The semi-official *Herald* newspaper in Harare denounced 'well-fed and prosperous Europeans and North Americans, wearing leather shoes and tucking into high-priced meat dishes, telling African peasants that basically they are only on earth as picturesque extras in a huge zoo' (Morrison, 1989, 93).

Backing their government, several Zimbabwean conservation interest groups announced their continued support for elephant culling operations before the 1992 CITES meeting in Kyoto, Japan. The Zimbabwe National Conservation Trust, an umbrella group of Zimbabwe wildlife conservationist professionals and wildlife enthusiasts, backed resumption of ivory trade based on Zimbabwe's philosophy of sustainably utilising the elephant, and ploughing the proceeds back into rural areas and anti-poaching activities ('Conservation Trust Backs', 1991). The wars of words, however, resurfaced in the months preceding the Kyoto meeting to reconsider the ivory trade ban. The Environmental Investigation Agency and the International Wildlife Coalition, on the eve of the 1992 CITES meeting, claimed that Zimbabwe's Department of National Parks and Wildlife Management was demoralised, inefficient, and weakened by corruption. Further, Zimbabwean military personnel were supposedly involved in a massive ivory smuggling scheme through South Africa, and that top government officials in both countries were cooperatively engaged in an official cover-up of the matter (Orenstein, 1992). It is revealing of the moral/economic side of this whole debate how skilfully Zimbabwe is vilified by being lumped officially with South Africa, a country with whom it still has no diplomatic relations, and whom South Africa accused at the time of still harbouring ANC guerrillas. The UK Elephant Group, an umbrella organisation of British conservation groups, urged the British Overseas Development Agency to withdraw its funding for the post of Botswana's Director of Wildlife, as punishment for that country having joined Zimbabwe's crusade for a limited resumption of the southern African ivory trade, based on sustainable utilisation of the species ('Botswana Wildlife Job', 1991).

Switzerland was the only country outside of southern Africa to openly support the Zimbabwean-Botswanan argument that favoured a controlled trade in southern African ivory as an effective means of elephant conservation. The head of the Swiss delegation said 'many delegations took positions dictated by their home politics more than by scientific considerations' (Zingg, 1992, 3). He also used the term eco-colonialism to refer to the character of the whole debate on the southern African proposal, and how the North was ignoring southern Africa's history of wildlife conservation (Zingg, 1992). Similar comments were made by conservation professionals from other countries. The 1992 CITES meeting, normally made up of conservation and wildlife management professionals from mid level government bureaucracies, was in 1992 attended by an extraordinary number of government ministers who sat at the conference tables in front of their wildlife managers.

In the aftermath of the 1992 Kyoto meeting, in what was apparently a reaction to the events of the meeting, at which the southern African nations were rebuffed in their attempt to reopen a controlled trade in elephant products, new rules adopted by the body call for formal consultations with affected states before CITES trade bans can go into effect. The southern African nations, particularly Zimbabwe, had complained of 'eco-colonialism', in that they saw outsiders telling them how to utilise their natural resources. Further, the theory of sustainable utilisation of species was positively acknowledged by many present, which may be an indication that CITES is questioning the wisdom of total trade bans as a means of protecting species ('Four Southern African Nations', 1992). Undaunted, Namibia, Malawi, Botswana, and Zimbabwe announced they would make preparations to set up a southern African ivory trade, but did not outright commit themselves to an immediate resumption of the elephant products trade.

Further, Zimbabwe announced in July 1992 that, due to serious drought and the imperilled living conditions of both humans and wildlife, 2000 elephants in southeastern Zimbabwe would be shot, and the meat distributed free of charge among those in need of drought relief. Even in the face of serious human suffering, Western governments and conservation organisations have refused to provide funds for this culling operation. Instead, they have committed $1900 per elephant to tranquillise and relocate 1000 of these elephants to local private ranch lands, to set up new 'eco-tourism' industries ('U.S. to Help Zimbabwe', 1992).

The Consequences of Ignoring Environmental Historical Context

This paper has addressed the same question in different ways—how and why are international environmental agreements reached and implemented? First, the essay has had a broader interest in theory-building: international environmental policies are increasingly the results of an interaction of moral, regulatory, and economic attempts at large scale transnational persuasion. This has been an attempt to move forward important pioneering work by Oran Young and John Dryzek, by critically examining the interaction between these forms of policy persuasion, and by extending international environmental policy analysis to include the possibility of acrimonious conflict over ecological concerns. As environmental consciousness (however defined) moves people for various reasons in various parts of the world to form strong opinions about the global environment, and as economic development issues in the South potentially clash with this consciousness, such a theoretical rubric is needed by analysts concerned with global ecological policymaking. When combined with the traditional concerns of nation-states over sovereignty, this mix of variously-defined morality and economic development has a truly explosive potential, especially when a large percentage of the outside world ignores the constraints that 100 years of racist environmental policy has imposed on Zimbabwe's current attempts to change its citizens' attitudes toward elephant preservation. Further, future research should address any emerging North-South conflicts over the environment.

Second, this study has sought to put the specific question of elephant conservation into a framework which addresses the conflicts outlined above. Clearly, important ecological issues such as the survival of Earth's largest land mammal are not solely scientific, but are clouded by both moral concerns over the species' right to survive, and by the economic and safety concerns of those who must live near these potentially destructive creatures. As the above case study has shown, neither scientific nor economic arguments over how to best protect the species can remain untouched by appeals to morality and attempts by international interest groups to elevate elephant survival to this new level. Clearly, interest group politics is at work in this debate over how to best save the African elephant, and the question of the animal's survival is surely a larger issue. Indeed, the 1989–1992 (and continuing) debate over the international ivory trade is likely a harbinger of other international environmental debates, some of which will undoubtedly be more acrimonious than this one. The study of international ecological politics surely must seriously address this interaction of historical context, moral persuasion, administrative regulation, and economic development further, particularly when elements North and South take opposing sides, and the autonomy and power of developing states is influenced by foreign interest groups, no matter how well meaning.

NOTES

1. Unlike the case with almost all other threatened species, which are at risk because of habitat loss, the elephant and the black rhino are directly threatened by poaching. Further, as mentioned above, the concentrations of elephants in southern Africa are actually a threat to themselves, since the elephant, owing to its size and eating habits, will destroy a finite environment if populations grow unchecked. This is precisely what happened in Kenya's Amboseli National Park in the early 1970s, when, instead of prosecuting controlled culls of elephants, parks officials and ecologists let the herds grow unchecked. The result was that savanna land was turned into near desert, and thousands of elephants starved.

2. A paleontologist by training, and the son of the famous archaeological team of Louis and Mary Leakey.

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The Power of Environmental Knowledge

*Ethnoecology and Environmental Conflicts in
Mexican Conservation*

Nora Haenn

Introduction

In his summary of political ecology theories, Grossman described this diverse body of research as tending to emphasize how "agriculture and environmental change are influenced by state policy, regional trading blocks …, investments by transnational capital, penetration of the market, and the social relations of production" (Grossman, 1998, p. 18). Other researchers also suggest that the effects of power systems on environmental outcomes stem from the outcome of competing interests among various parties (Blaikie & Brookfield, 1987; Peluso, 1991; Schmink & Wood, 1987; Stonich, 1993; Stonich & DeWalt, 1996). While supportive of these approaches, this article also draws on recent work describing the importance of the meanings assigned to ecological systems (Escobar, 1999; Rocheleau *et al.*, 1996) to question how epistemological differences contribute to environmental conflicts. Following calls to examine the interface between environmental knowledge and action (Nazarea, 1999b, p. 7), consideration is given to ethnoecological constructs of forests in Campeche state on Mexico's southern Yucatán peninsula to explore how these constructs frame opposition to conservation activities.

Southeast Campeche is home to the Calakmul Biosphere Reserve, Mexico's largest protected area for tropical ecosystems. Declared in 1989, the Reserve's existence was communicated a year later to the 25,000 migrant, swidden farmers or *campesinos*, who now live in its buffer zone.[1] After an initial period of intense local opposition to the Reserve and newly imposed restrictions on subsistence activities (hunting, and burning and felling forests), government agents and farm leaders brokered a settlement in which farmers would receive increased economic aid in the form of sustainable development projects. Government aid calmed public expression of anticonservationist sentiment, while farmers privately continued to resist the application of conservation measures outside Reserve limits. In this resistance, farmers describe tensions

surrounding conservation as centering on competing class interests in resource control and on conflicting ideas regarding the government's appropriate role in land stewardship.

Farmers, urban dwelling environmentalists, foreign researchers, and local and national government agents all participate in ongoing negotiations regarding land use in and around the Reserve. In addition to the offices of government agencies, these negotiations take place in everyday places such as the restaurants of the region's administrative center and farmers' fields and homes where many sustainable development projects are carried out. Participants in these negotiations employ different meanings and definitions of Calakmul's environment. Often, these definitions are tangential to negotiations that otherwise focus on land use. Nevertheless, these categories frame environmental conflicts at Calakmul, and the following discussion explains how that is the case. In the conclusion of this article, the possibilities for alternative environmentalisms at Calakmul based on local ethnoecologies are explored.

The Setting

The Calakmul Biosphere Reserve encompasses 1,787,000 acres of seasonal tropical forests. Located near Mexico's borders with Guatemala and Belize, the Reserve connects with protected areas in these countries as part of a 5-million-acre extension of lowland forest (Mansour, 1995).

Researchers generally characterize southern Yucatán forests according to height and amount of leaf loss in the dry season (Table 21.1). As a seasonal tropical ecosystem, the Reserve and its 608,000-acre buffer zone experience markedly different dry and wet seasons.[2] Data show that on the average, rainfall in 1 of 4 years falls below 800 mm, creating drought conditions (Folan, 1991). Water shortages create particular difficulties for Calakmul's residents, who rely on rainfed agriculture and standing water sources.[3] During times of water scarcity, communities use water delivered from some of the region's larger lagoons. The author's 14 months of participant observation in Calakmul began in the fall of 1994, at the end of a drought year when many families required food aid to subsist. The following year, two hurricanes buffeted the region, flooding crops and forcing farmers to turn again to government relief for survival.

Although scientific descriptions provide an overview of Calkamul's ecology, much remains to be learned about the specifics of forest growth and regeneration at

TABLE 21.1
Tropical Forests of Calakmul Region

Type	Description
High evergreen	Canopy greater than 30 m
Medium semievergreen	25–50% leaf loss in dry season; canopy 15–30 m
Medium subdeciduous	50–75% leaf loss in dry season; canopy 15–30 m
Low semievergreen	25–50% leaf loss in dry season; canopy less than 15 m
Low subdeciduous	50–75% leaf loss in dry season; canopy less than 15 m

SOURCES: Boege, 1995; Ericson, 1996; Gates, 1993.

Calakmul. Throughout this century, the forests of southeast Campeche have been heavily exploited for forest products. During the 1980s, regional sawmills ceased operation because of a lack of harvestable timber. Botanical investigations of the region began in the early 1990s, at which time researchers encountered a forest lacking older trees. Photographs from the 1950s show taller trees of greater diameter than can be found today (Beltrán, 1958).

Current scientific understandings of Calakmul's environment are rarely communicated to the region's people. Instead, the governmental and non-governmental administrators of regional conservation and development projects tend to speak in generalities about the need to protect forests and prevent animal extinctions. These generalities are part of a larger picture in which competing, sometimes conflicting, ideas of the regional environment coexist.

Ethnoecologies at Calakmul

Because southeast Campeche is home to migrants from all regions of Mexico (Haenn, 1999), farmers use a variety of constructs to understand their new environment. However, despite their many differences, Campeche's farmers generally agree that the physical environment is a powerful entity, and a place of work.

The notion that the environment is a powerful entity is an analytical construct based on Milton's suggestions for reconsidering the way anthropologists understand how people conceptualize the environment. "As well as giving environments," she writes, "we might be able to identify passive environments, vindictive environments and so on" (Milton, 1996, p. 119). In accordance with this, Milton points to the existence of "non-industrial societies which do not recognize a human responsibility to protect the environment" (Milton, 1996, p. 133) because the environment as a force in itself lies outside the human domain. In these cases, the environment may be understood as powerful or having an independent vitality which challenges human ability to create a social order within it.

Spirits, known as *duendes* or *aluxes*, may live anywhere, but farmers associate them most commonly with forests and Mayan ruins. *Duendes* are tricksters said to carry away children lost in the forest. Farmers in one village described how a 3-year-old child became inexplicably lost for 2 days in the small woods immediately adjacent to her house. When the search party finally found her, she said her "brother" had cared for her during that time. Villagers believed this "brother" was a spirit.

Evangelical faiths have taken up the *duendes* as part of their proselytizing efforts. To counter syncretic Roman Catholic beliefs, evangelicals demonized *duendes* and, not coincidentally, reinforced the notion of forests as dangerous, asocial space. In their reconstruction of Genesis, evangelicals explained that when Satan was driven out of Heaven, he came to the Earth, and now lives in forests in the form of *duendes*. By accepting evangelical teachings, converts become immune to the power of *duendes*, although the spirits continue to lurk in the forests. Forest spirits are part of a larger depiction of forests as "ugly," untamed wilderness. Calakmul's farmers regularly

describe people who live in the forest as "dangerous." Forests are thus not only powerful, but can be essentially threatening to social order.

For many farmers, the power of forests lies in the way they "always grow back." Felling forests and farming are actions that bring land under social control, thereby limiting the forest's power. Attitudes toward this aspect of environmental power fall into two general areas. In the first area, people tend to see cultivated and wild plants as different ends of a continuum. Where cultivated plants now exist, weeds will take over, and eventually taller, secondary growth will emerge. Within this configuration, creating agricultural fields brings forests under human control only temporarily. Forest regeneration remains desirable because it enriches land for future farming.

In the second area, farmers view forests in direct opposition to cultivation and wealth. For them, the existence of forests marks the absence of productive activities, and they describe a need to permanently fell forest: "When I fell forests, it's for good." Before migrating, farmers in this group often had occupied positions in industrial agriculture. They came from areas in the states of Veracruz and Tabasco where large-scale deforestation in the 1950s and 1960s created landscapes with little more than patchy remnants of once extensive forests. For these farmers, a natural landscape is one that has been markedly modified by human activities. They tend to view the forest's power as predominantly negative.

In addition to the concept of a powerful environment, interviews conducted with 10 men of distinct state and ethnic origin elicited common themes of how the environment is a place of work. Fields are "where we work" (Murphy, 1998). Forests are future farmlands "where we're going to work." Interestingly, a separate category consisted of those places "where we cannot work," including protected areas and archaeological ruins (which Mexican law prohibits people from altering in any way).

Within this general framework, the men evaluated specific landscape features according to what kinds of work took place there in the past, and what possibilities that place offered for future work. Using forest height and tree diameter to measure length of time since a felling, they described the forest as being in one of three categories. *Acahuales*, or forest felled within the last 5 to 10 years, with immature trees having narrow trunks, require less work to clear and are preferred sites for future farming. The second category, *monte*,[4] is forest felled within approximately the last 10 years. The labor demands in felling *monte* obviously are greater, and in addition to the ubiquitous machete, farmers may need to use one of the few functioning chain saws locally available in order to clear land covered in *monte*, which is a secondary preference for future farming sites. The final category, *montaña*, is forest that farmers recognize as never having been felled. Without access to a chain saw, farmers must exert considerable labor in axing *montaña*, which makes it the least preferred site for farming.

Although a variety of local ethnoecologies has been distilled into two generalizations, in Calakmul's political arena this variety underwent further narrowing. Farmers and government agents translated the notion of environment as a place of work into an argument for sustainable resource use. This argument is explored in greater detail later. Here the focus is on the salience of an ethnoecology based on work in a region that is home to a diverse, sometimes divided, farm community.

Nearly all of Calakmul's current population have migrated to southeast Campeche in the last 30 years. Although most people moved from neighboring tropical states, at least 23 of Mexico's 32 states are represented. State of origin is an important identifier among farmers, as is affiliation with an indigenous group. However, despite this diversity, farmers are able to rally around their common identity as *campesinos*. Although *campesinos* are people who farm, the word also indicates a class identity. *Campesinos* are people who do not receive a regular salary. Their poverty makes them vulnerable to powerful outsiders. Farmers use this common identity, especially when dealing with government agents and urban and international environmentalists. As *campesinos*, they present a united front in pressing for access to various resources. Common understandings of the environment as a place of work coincide with a common identity based on subsistence farming. As farmers struggle to negotiate differences among themselves and between themselves and outsiders, this shared identity and ethnoecology are powerful tools for organizing messy social fields.

Contrasting Ecologies

Campesino land classifications are not that distinct from the scientific categories underpinning the Calakmul Biosphere Reserve. Both systems use forest height as a focal point for organization. At the same time, the systems exhibit two basic differences. Campeche's farmers understand forests as asocial places where people's proper role is to carry out subsistence work, and forest height marks past human activities. This contradicts the botanical categories circulated in policy and research papers on Calakmul, which generally depict forest growth from the perspective of an absence of human activity. In conservation settings, the notion that ecology is best understood without consideration of human activities often is translated into the concept that an ideal environment is one devoid of human presence (Hunter, 1996).

The second difference centers on the way the two systems conceptualize change over time. The idea that a healthy forest is one that achieves full growth potential with little disturbance tends to carry an additional understanding of short-term, engineered change as detrimental to ecosystem health. For Campeche's farmers, ideas of environmental quality vary with changing economies. Short-term changes in forest composition that meet current market trends make the most sense. In the long run, flexibility in access to a variety of resources is the most desirable strategy.

Because of the contrasts between these two environmental models, one might expect conflict in the application of conservationist ideas to land use in southeast Campeche. Indeed, farmers bristle against regulations that restrict hunting, swidden burns, and the felling of older growth forest. At the same time, they publically espouse environmentalism in order to cultivate financial aid in governmental and international circles. The following sections explore how this contradiction developed and, in particular, how farmers and certain government agents have promoted forest use under the mantle of sustainable development.

Environmental Conflicts at the Regional Council

Calakmul's first Reserve Director, Deocundo Acopa, described a broad division in the conservation community between those who support the sustainable use of resources and those who believe environmental protection requires a strict separation of people from protected areas. He characterized this latter position as the *no tocar* or "do not touch" approach. The debate between resource use and resource preservation in Mexico has documented connections with similar disagreements over the wise use of natural resources in U.S. conservation history (Simonian, 1996). As described by Acopa and members of Calakmul's farm community, this debate resonates with the knowledge systems outlined earlier. At the same time, advocates of the two positions occupy different positions of power, and, in general, those who promote preservation tend to have greater education and financial means than Calakmul's farmers (Deocundo Acopa, pers. comm., July 3, 1995). In this way, Acopa saw environmental knowledge as implicated in power systems. He was very interested in power structures and viewed his principal work as Reserve Director as managing competing interests to the benefit of both Calakmul's forests and its people.

Acopa's was the most influential government office in southeast Campeche, and he sponsored regular meetings in which representatives of regional farm organizations, nongovernmental environmental groups, and various government offices met to communicate (and, to a lesser extent, coordinate) their actions. In these meetings, Acopa usually was partisan to the positions held by regional farmers. Acopa was a nationalist and sympathetic to the *campesinos*' poverty. He saw farmer control of resources as part of a larger struggle for *campesino* self-determination. At the same time, on receiving his appointment to the Reserve directorship, Acopa was given the mandate to win Calakmul's inhabitants over to Mexico's ruling PRI party. In the words of one government agent, Acopa's job was to "get the politics in the palm of his hands." His partisanship in conservation was part of a larger goal of strengthening Partido Revolucionario Institucional (PRI) support in Calakmul.

Acopa had ample resources to use in addressing the dual agendas of conservation and electoral politicking. Soon after the Reserve's declaration, government agents representing the PRI quieted antienvironmentalist sentiment by offering a deal. In return for votes in a gubernatorial election, Calakmul's residents would receive increased development aid. Farmers agreed to this votes-for-development deal in 1991. Both the agreement and the subsequent development programs were couched in neopopulist rhetoric of self-help and personal empowerment. In a personal visit to the region, former Mexican President Carlos de Salinas charged farmers with "caring for the Reserve." In the following years, *campesinos* received programs aimed at both protecting standing forests and encouraging self-sufficiency in the farm sector. These programs included agroforestry, sustainable timber harvesting, organic agriculture, intensive cattle ranching, and wildlife management, among others (Acopa & Boege, 1998).

Although paid for with federal funds, the programs were administered by the Xpujil Regional Council, a farmers' organization supervised by Reserve Director Acopa. At the time of the author's field work, the Regional Council was a powerful player in southeast Campeche's political scene. The Council's budget rivaled that of

any government agency working in the region, and its programs reached into more than 40 of the 72 villages then located in the Reserve's buffer zone.

Council assemblies were a meeting ground of conflicting ideas about environmental management. During assemblies, village representatives met to oversee the work of the Council's board of directors. As many as 300 men and women attended the monthly meetings, making the Regional Council a natural place for disseminating government directives (e.g., on fire control during the burning season) or for cultivating support within the broader farm community.

At Council assemblies, Acopa encouraged farmers to take advantage of funding for environmental programs while elaborating his notion of conservation. Acopa described biodiversity as "diversity in use." He believed that if *campesinos* received financial gain by exploiting an array of forest resources, then they would be motivated to protect those diverse resources. Acopa simplified this idea into repeated admonitions that Council programs aimed to protect the environment so that people might use it.

Acopa pressured researchers and nongovernmental staff to request from the Council assembly permission to work in the region. He also demanded that researchers present their findings to the assembly. These presentations often occasioned responses meant to align research and development aid with local interpretations of the environment. For example, one foreign researcher presented his proposal to study jaguars through the use of radio collars. A number of farmers voiced an acceptance of this project based on the need to eliminate jaguars living threateningly close to community water supplies. Both the investigator and Reserve Director Acopa quickly explained that the research might have another use, specifically tracking jaguars for ecotourists who might photograph the animals.

Continued Resistance

Despite these [development] programs, farmers in southeast Campeche continued to resist conservation. Although their resistance had many sources, two points were particularly striking. One area of resistance was based in local ethnoecologies. If land is a place of work, then outsiders must have some kind of use in mind for the Calakmul Biosphere Reserve. Thinking along these lines, farmers viewed the goal of setting aside land that nobody would touch as a tactical manuever on the part of government agents and urban environmentalists who aimed to control forests for their own ends.

The second source of resistance lay in local ideas of government-farmer relationships. Mexico's federal government has depended on a social contract with peasant farmers to create the perception of legitimate federal rule (Hart, 1987; Nugent, 1993). This contract includes providing farmers access to land and support in the form of technological inputs and development projects. When Salinas charged farmers with "caring for the Reserve," he invoked this contract by offering symbolic ownership over the Calakmul Biosphere Reserve. Still, farmers recognized the difference between symbolic and actual ownership. They opposed programs that took land out of the agricultural base on grounds that such actions constituted a breach in their social contract with government authorities.

Although the ideal government-farmer relationship enables farmer livelihoods, Calakmul's farmers have learned that many government practices undermine subsistence. Consequently, farmers link conservation to endemic corruption among Mexico's ruling authorities. In 1995, government agents monitoring older-growth forest were ambushed on leaving a community under surveillance for illegal felling. The farmers involved murdered one of the agents. Although this event was reported in the urban press as an act of poachers, locally people viewed the murder as retribution, because the agents were rumored to be extorting bribes from peasants.

Basing their conclusions on such rumors of corruption, farmers surmise that environmental regulations contribute to more than competing interests in natural resource control. Such regulations also open a new field for illicit government activity. Therefore, when talking about the Reserve with one man, the author asked if he saw that animals were becoming extinct. The man replied, "No, the President invents these things, or he's taking advantage of something." Saying *somos tan desconfiados*, "we are so mistrustful," farmers repeatedly asserted a lack of confidence in government actions. At the same time, because conservationism opened new economic and political avenues, farmers were willing to use environmental issues to engage government agents (see also Haenn, 1998).

Rather than change local ideas of the environment, conservation projects provided farmers with new rhetorical tools for appealing to people interested in environmental protection. Astute farmers soon learned to mimic conservationist rhetoric publicly while privately continuing to operate within their previously held constructs. For example, Jerónimo explained to me that his village had distributed land to its members in such a way as to promote forest conservation. When asked just how the village's land distribution pattern (no different from any other in the region) encouraged conservation, Jerónimo could not answer. He had given the answer he thought I, who had arrived through the introduction of the Regional Council, wanted to hear.

Jerónimo participated in every sustainable development project offered in his community. He also sat on nearly every village committee overseeing these projects. Later I learned that although Jerónimo signed on for all projects, he followed through only on those he thought useful. For example, one year Jerónimo planted reforestation trees provided by the Council. The following year, on another Council project, he was able to plow his land with a tractor, a project that he was convinced would increase his harvest. With the Council tractor, Jerónimo plowed under the reforestation trees.

Jerónimo is one example of how farmers are wary of both environmental regulations and the benefits brought about by integration into conservation development programs. In this setting, farmers' notions of environment as a place of work take on political implications in the overall struggle to defend access to land. As farmers deal with the vagaries of an undependable government and marketplace, maintaining access to an environment in which they can work remains crucial to their livelihoods.

Conclusions

In calling for an ethnoecology that bridges knowledge and action, Nazarea (1999a) noted the importance of ethnoecologies as situated knowledge within overlapping power structures. The ethnoecology popularized and politicized by Reserve Director Acopa self-consciously mediated a division in knowledge and power between Calakmul's *campesinos* and urban and international elites.

Through the Regional Council and their alliance with Reserve Director Acopa, *campesinos* have promoted their notion of the environment as a place of work to counter preservationist ideas associated with the park model. Throughout my research, these two constructs had a symbiotic relationship such that one would hardly be mentioned without reference to the other. I came to question the interdependence of these two constructs. Could their pairing serve some purpose?

Since this research, much has changed in Calakmul. At the end of his tenure, Reserve Director Acopa moved to another site in Mexico's tropics. When its federal funding ended, the Regional Council received support from international donors for conservation development projects. These funds were not renewed, and the pervasive conservation development activities studied have ceased. Even at the height of conservation activities in 1995, policy makers had doubts about the programs' durability. They were unsure whether the programs, even if fully implemented, would actually result in continued forest cover and an increased standard of living for the region's families.

Given the tenuousness of conservation at Calakmul, I believe the connection between use and preservation served a variety of purposes. The opposing ideas provided latitude in which *campesinos*, government agents, and environmentalists could test both conservation programs and their respective strengths in shifting political fields. The opposition allowed farmers to take advantage of new subsidies while protecting their economic foundation in subsistence agriculture. In espousing both use and preservation, federal authorities appealed to conflicting interests among divergent constituencies. Finally, as scientific knowledge about Calakmul continued to accumulate, the opposition allowed policy makers to experiment with various conservation measures without forsaking any future path for protection.

Antienvironmentalism remains a powerful sentiment at Calakmul. In addition to their class critique of conservation, Calakmul's *campesinos* are aware that the tension surrounding resource management stems from the different ways in which people see the world. The material from Calakmul suggests that part of the political ecology of resource management lies in this intersection of power and knowledge. Calakmul's *campesinos* may have a more detailed awareness of divergent knowledge systems because environmental regulations and sustainable development projects force farmers to reckon with alien environmental categories. At the same time, the fact that a diverse body of local ethnoecologies has become distilled into the notion of environment as a place of work means that other possible areas for land use negotiation (such as aesthetic or cosmological considerations) are obscured. This distillation is not unusual. As Wolf (1999) has written: "ideas and idea-systems are often monopolized by power groups and rendered self-enclosed and self-referential" (p. 7).

The Regional Council's program raises questions about possibilities for a more localized environmentalism. Does an environmental ethic exist in the political strategizing and anticonservation sentiment with which Calakmul's residents approach conservation development? Johnson (1999) cited the need to examine antienvironmentalism as part of the overall project of environmental protection. His research into the formation of a U.S.-protected area at the turn of the century questions the extent to which positions labeled as antienvironmentalist may contain wilderness ethics at odds with those favored by professional environmental managers. Johnson describes a situation similar to Calakmul in which subsistence users came into conflict with local and urban elites who intended the park for tourism and sport hunting. According to Johnson's documentation, the latter environmental ideas won out over the former.

In my research, I met farmers opposed to conservation as described by government agents. They especially opposed government appropriation of land for parks, but nevertheless maintained part of their farm parcels as forest for hunting or for collecting some other forest product. It is possible that with continued funding, small-scale sustainable development projects would have provided a format for greater elaboration of a localized environmentalism at Calakmul. Given the economic insecurity of subsistence agriculture and the wariness with which farmers approach government agents, it would not be surprising if this environmentalism built on notions of work to stress political autonomy and secure access to natural resources.

N O T E S

1. In 1996, Mexican authorities created the *municipio* of Calakmul composed of the Reserve and its buffer zone. A *municipio* is roughly equal to a U.S. county. In the following, the word "Calakmul" is used to refer to the area now within the *municipio's* limits, whereas "Reserve" signifies the Biosphere Reserve.

2. See Whitmore, 1990, on distinctions between tropical and seasonal tropical forests.

3. No permanent streams or rivers exist in the Calakmul region. The area's limestone base, typical of the entire peninsula, quickly absorbs rainfall.

4. *Monte* is the general term applied to any growth that is not directly cultivated by humans. Here I draw on one of the word's meanings as it relates to forest growth.

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Holding Ground

Kent Redford, Katrina Brandon, and Steven Sanderson

Conservation Clichés

"*The parks frontier is closed.*" According to the logic that produced this cliché, empty spaces are gone, so there can be no more parks created. But, increasingly, we realize that there was very little empty space to start with, and that parks and other types of protected areas have almost always been created on top of existing populations or areas used by someone. When this cliché is used, it is often in a hopeful sense—hopeful that the political will does not exist to generate new parks in areas occupied or claimed by people. Yet recent statistics show that the number and extent of protected areas created in 1990–94 exceeded that of any previous five-year period (WCMC, cited in *Oryx* 1997).

"*Empowerment of local communities will save more biodiversity than will parks.*" This cliché is based on the assumption that there is such a thing as local people who operate in a cohesive community fashion. All too often this is not the case (Agarwal, in press). As Borrini-Feyerabend (1996) states, "Communities are complex entities, within which differences of ethnic origin, class, caste, age, gender, religion, profession, and economic and social status can create profound differences in interests, capacities and willingness to invest in the management of natural resources." It is clearly not that communities are "bad" but rather that they must not be stereotyped. Some will actively work to conserve some components of biodiversity; others will not, and have not.

"*People have created biodiversity, so they are essential to its survival.*" As with many of these clichés, this one contains a grain of truth. Biodiversity is a social invention; people are its inventors as a meaningful concept. However, that does not mean that manipulation of biodiversity leads to its conservation. Furthermore, this cliché erroneously assumes that human influence in the selection of certain species and the structure of certain ecosystems has resulted in changes that would not be maintained in the absence of humans. It further incorrectly assumes that the sort of selection practiced by earlier human generations continues to be practiced by contemporary peoples.

"*Biodiversity per se can be both used and conserved.*" The term *biodiversity* has very frequently been appropriated from its biological roots by political actors less interested in conserving the biosphere than in who gets to use the biosphere, under what property rules, and with what allocation of the losses and gains from use (Sanderson and Redford 1997). As a result, it is used as a monolithic term in phrases such as this one, which ignore the fact that biodiversity has different components (genetic, population-species, community-ecosystem) and different attributes (structure, function, composition). Each one of these components and attributes is differentially affected by different types and intensities of human use (Redford and Richter 1998). Ignoring the complexity of the term allows the politically expedient conclusion that humans can both use and save "biodiversity." The power (and danger) of this cliché in the parks arena is demonstrated in a document produced from a meeting of representatives of the park systems of fifteen Latin American and Caribbean countries, which contains the statement, "Little by little it is being recognized that biological diversity must be simultaneously protected and used" (FAO 1994). This logic, from park authorities themselves, belongs in a looking-glass world, where use and conservation are the same. Its simplicity is betrayed by its evident denial of the need not to consume.

"*Parks must be viewed as resources.*" The previous cliché is echoed in this closely related one that directly addresses parks. This expression comes from a belief that the social value of protecting nature is not important in and of itself, and that parks must justify their existence in strictly economic terms. As Reid (1996) states, "The very name 'protected area' is a throwback to early conservation philosophy that viewed conservation as an alternative to development, not a component of development.... The term conveys the message that barriers exist between the resource and society." But it is exactly these barriers that were created by the society to maintain parks and their socially derived "non-resource" values.

"*Local people hate parks,*" or "*You have to choose between local people and parks.*" Ghimire and Pimbert (1997) state that "a growing body of empirical evidence now indicates that the transfer of 'Western' conservation approaches to the developing countries has had adverse effects on the food, security, and livelihoods of people living in and around protected areas." Despite this broad claim, the cases in this book and others (e.g., MacKinnon 1997) illustrate that parks and the organizations that support parks can bring strong benefits to local people, benefits that would not otherwise be made available to these people.

"*Because of use of the 'Yellowstone model,' parks are imperialistic impositions on third world countries.*" The argument can be made that land and the animals and plants it contains have been set aside from use by interested groups for many centuries in many parts of the world; from the Chinese and Persian hunting gardens to the sacred groves of India and West Africa. The New Forest in England has been a "protected area" since the twelfth century, although what it was designed to protect has changed from game through ship timber to wild nature (Heathcote 1994). The claim that national parks are a "rich-country institution" (Southgate and Clark 1993) is to deny inhabitants of other than rich countries the right to choose what options they would like to use in developing their own ways of life.

Conservation Generalizations

"*Parks may be ecological islands, but they are part of the social and political mainland.*" Parks are islands in some respects but clearly not in others. By generalizing their insular qualities, it is easier to use isolation as an excuse for economic integration. Acknowledging parks as part of a set of societal values allows them to be supported for what they are and not condemned for what they are not.

"*Ignore history at your own peril.*" Understanding the biological and social history of a given site, together with the political circumstances surrounding its creation, is essential in creating feasible conservation programs. As Brandon points out, the circumstances of origin create significant phylogenetic or design constraints that can strongly influence the success or failure of conservation actions at a given site. Standardized approaches must be used as the raw material from which to tailor locally appropriate, enduring conservation solutions.

"*Ignore scale at your peril.*" Each site is linked to regional, national, and international scales through agricultural, trade, and colonization policies and the politics of conservation, development, and local peoples. These connections can interact with one another and create conditions that impact threats, partnerships, and policies. Moreover, there is no "right scale," but a set of cross-scale dynamics important to biodiversity. When crafting local approaches, it is vital to understand the proximate and ultimate driving forces that have influenced and will continue to influence conservation actions.

"*Work at protected areas needs to concentrate on alleviating threats to the biodiversity components that the site is designed to protect.*" Much work has been done at sites that is not directed specifically at ensuring the long-term conservation of those things that the site was established to conserve. Much of the work at integrated conservation and development projects has not clearly linked development activities to specified conservation objectives and has therefore not guaranteed conservation outcomes (Wells and Brandon 1992). In fact, some inappropriately focused development activities have resulted in "death by friendly fire"—the destruction of that which they were designed to preserve. Without being precise about the purposes of a given conservation area, it is difficult to develop appropriate conservation actions (Weeks 1997).

"*NGOs can be effective agents for conservation.*" NGOs can navigate the constantly shifting terrain between nature, local people, nonlocal people, national governments, multilateral organizations, and other NGOs. They can bring attention and resources to help protect a given site and to help ensure that people living near the site receive government services. Though the terrain is slippery, they can fulfill functions of national governments in ensuring the long-term survival of national patrimony.

"*Parks cannot be conserved without national governments.*" All too often the role of national government is neglected, yet it is within the network of national policy and politics that parks must exist. Neglecting this fact can only risk failure. All too frequently the rhetoric surrounding parks has focused on local people and international actors, failing to focus on the vital role, good and bad, played by national governments.

"*Be prepared for creative partnerships,*" and "*Look for the charismatic leader.*" Common goals can make for uncommon partnerships. The Parks in Peril program has

created a means for different constituencies with sometimes conflicting agendas to find common ground. This common ground and the desire to locate it has frequently been catalyzed by self-selecting individuals who can emerge to play vital roles in crafting enduring solutions.

"*Conflicts are not constant, but parks must be.*" Conflict concerning a given protected area shifts over time, involving different threats, different interest groups, and different social values. When developing ways of resolving these conflicts, it is vital to understand these shifting contexts and not compromise the long-term viability of the park itself under the belief that resolving a given conflict will provide an eternal solution.

"*Stereotypes are fatal to new solutions.*" Nonconformity and the possibility of unexpected solutions are frequent surprises. These may arise from unexpected people, unexpected coalitions, unexpected agencies, and novel circumstances. The case studies have in common the unexpected solution and the openness to explore the unexpected. Stereotypes and clichés serve only to prevent recognition of novelty.

Conclusion

The biodiversity that parks are designed to protect is a social good. Many of the parks in Latin America and the Caribbean were created in the 1980s, before the decade of biodiversity—the 1990s. The anomalous nature of the term *biodiversity* has contributed to the criticism that parks are not achieving their mission, and its increasing adoption worldwide has led to an expectation that parks were designed to save "biodiversity." Yet this term is essentially a political one whose appropriation by politically interested actors has led to a significant critique of national parks (Sanderson and Redford 1997).

Yet the pressure remains inexorable on parks, a meager 5–10 percent of the earth's surface. Parks have become the stage on which many demand action to redress rural poverty, social justice, gender inequity, and the plight of indigenous peoples. Parks are also supposed to be the testing ground for sustainable development and compatible resource use. The strident voices of critics the world over condemn parks for not solving many of the ills accumulated over centuries of capitalist excesses. Why are these critics focusing on parks and not on the 90–95 percent of the rest of Earth's land surface? Is it because they are unable or unwilling to make demands of the powerful groups that control the destiny of this vast majority of the earth?

The Parks in Peril program is a feisty, creative middle ground. It is true that parks may have been created by "top-down" forces, but that is the only way they could have been created. "Bottom-up" in situ efforts have created systems of sacred groves and sacred forests but nothing of a scale sufficient to preserve large portions of ecosystems. But top-down efforts will never ensure the conservation of a place that they have succeeded in creating. For this, the good will and enthusiasm of local forces are essential.

We stress that parks are necessary, but not sufficient, for biodiversity conservation. They must be seen as part of a national, regional, or ecoregional scheme that will

comprehensively and effectively address biodiversity conservation issues in parks as well as outside of parks. Park-based conservation must be integrated with conservation efforts focused on agriculture, forestry, grazing, pollution, water diversion, and urban areas. Parks may be jewels in the crown, but they will not survive in isolation. Parks aren't a failure any more than they are a success. They are a hope, a hope to be realized at single sites where a scientific understanding of biodiversity is married to the management of human progress and dignity. They are a reflection of the human desire to not completely destroy that which sustains us. Park advocates and park managers must work in close alliance with others trying to ensure a compatible future for humans and their societies, along with the myriad other species and systems inhabiting the earth.

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Does Biodiversity Exist?

Arturo Escobar

Does "biodiversity" exist? Is there a discrete reality of "biodiversity" different from the infinity of living beings, including plants, animals, microorganisms, homo sapiens, and their interactions, attraction and repulsion, co-creations and destructions? Foucault (1980) suggested that "sex" does not exist, but that it is an artificial construct required for the deployment of sexuality as an historical discourse. Is biodiversity similarly the construct around which a complex discourse of nature is being deployed? If this is so, then, as in the case of sexuality, the biodiversity discourse would anchor an entire apparatus for the dispersion of new truths throughout vast social domains.

From a biological standpoint, one could say that biodiversity is the effect of all this natural complexity, and that it could thus be specified in functional and structural terms. In fact, the current scientific approach to biodiversity is geared not toward "theorizing biodiversity" per se but towards assessing the significance of biodiversity loss to ecosystem functioning, and to ascertaining the relation between biodiversity and the "services" ecosystems provide.[1] Established definitions of biodiversity do not create a new object of study that is outside of the existing definitions in biology and ecology.[2] Rather, "biodiversity" is the response given to a concrete situation that is certainly preoccupying but which goes well beyond the scientific domain. As critical studies of science have shown, the act of naming a new reality is never innocent. What views of the world does this naming shelter and propagate? Why has this new way of naming been invented at the end of a century that has seen untold levels of ecological destruction?

From a discursive perspective, then, biodiversity does not exist in an absolute sense. Rather, it anchors a discourse that articulates a new relation between nature and society in global contexts of science, cultures, and economies. As a scientific discourse, biodiversity can be seen as a prime instance of the coproduction of technoscience and society that STS scholars analyze in terms of networks.[3] Technoscientific networks are seen as chains of sites characterized by a set of heterogeneous parameters, practices and actors. Each actor's identity is affected by, and affects, the network. Intervention in the network is done by means of models (e.g., of ecosystems,

conservation strategies); theories (e.g., of development, restoration); objects (from plants and genes to various technologies); actors (prospectors, taxonomists, planners, experts); strategies (resource management, intellectual property rights); etc. These interventions effect and motivate translations, transfers, travels, mediations, appropriations and subversions throughout the network. Although local practices might have extra-local origins and consequences, each site can be the basis of its own network.

The biodiversity network initially originated in the late 1980s and early 1990s out of conservation biology, where "the idea of biodiversity" (Takacs 1996) first flourished. It soon articulated a master narrative of biological crisis ("if you want to save the planet, this is what you must do, and here are the knowledge and resources to do it") launched globally at what has been called the first rite of passage to the "transnation state," the 1992 Rio Summit (Ribeiro 1997). According to actor-network theory, the biodiversity narrative created obligatory passage points for the construction of particular discourses. This process translates the complexity of the world into simple narratives of threats and possible solutions. The aim was to create a stable network for the movement of objects, resources, knowledge, and materials. This simplified construction was perhaps most effectively summarized in Janzen's moto about biodiversity: "you've got to know it to use it, and you've got to use it to save it" (Janzen and Hallwachs 1993). In a few years, an entire network was established that amounted to what Brush (1998) has aptly called a tremendous "invasion into the public domain." Yet the biodiversity network has not resulted in a hegemonic and stable construction as in other instances of technoscience. Countersimplifications and alternative discourses produced by subaltern actors also circulate actively in the network with important effects.

The biodiversity discourse has thus resulted in an increasingly vast institutional apparatus that systematically organizes the production of forms of knowledge and types of power, linking one to the other through concrete strategies and programs. International institutions, Northern NGOs, botanical gardens, universities and research institutes in the first and third worlds, pharmaceutical companies, and the great variety of experts located in each of these sites occupy dominant sites in the network. As they circulate through the network, truths are transformed and re-inscribed into other knowledge-power constellations. They are alternatively resisted, subverted, or recreated to serve other ends, for instance, by social movements, that become, themselves, the sites of important counterdiscourses. The network is continuously transformed in light of the translations, transfers, and mediations that occur among and across sites. Such sites are more than "local" places strictly speaking, and are defined by processes that take place within the network, where the boundaries of technoscience and other domains are never stable.

NOTES

1. The SCOPE (Scientific Committee on Problems of the Environment) Program on Ecosystem Functioning of Biodiversity, and the United Nations Environment Program's Global Biodiversity Assessment Program follow this approach. See SCOPE's technical volumes and the useful review of the project in Baskin (1997).

2. Article 2 of the Convention on Biological Diversity, for instance, provides the following definition: "'*Biological diversity*' means the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems." This definition has been further refined by the World Resources Institute (WRI) as comprising genetic diversity, the variation between individuals and populations within a species, and species and ecosystems diversity, to which some also add functional diversity.

3. In its "classical" formulation, the actor network theory was proposed by Callon and Latour as a methodology to study the coproduction of technoscience and society. It has been refined and transformed since by anthropologists of science and technology such as Rayna Rapp, Emily Martin, Deborah Heath and Donna Haraway.

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Road Kill in Cameroon

Michael McRae

Red dust coated everything in Otoumoukad: the thatch-roofed huts, the drying laundry, the neatly tended plots of cassava and maize, the jungle greenery crowding in on all sides. The little roadside settlement lay deep in the tropical forest of southeastern Cameroon, near the frontier with the Central African Republic. By 9:00 A.M., the air was already heavy with humidity. Each time another logging truck rumbled past, clouds of dust as fine as talcum boiled up from the road and drifted over the village.

Swiss photographer Karl Ammann and I had driven to Otoumoukad that morning after hearing rumors that someone in the village had a baby gorilla. Along with us were Reinhard Behrend, of the German rain forest group Rettet den Regenwald (Save the Rain Forest); our translator, Celestin Bitongolo Nkou; and Alfred, our lead-footed driver, who sped off in search of the car's grill, which had shaken loose on the rough roads.

The rumors proved correct. We found the infant gorilla cowering in the corner of a dark, one-room mud hut, grinding its teeth and straining against its tether. The owner explained in French that its parents had been shot two weeks earlier by a village hunter. The male had been wounded as it charged in self-defense but had managed to flee. The female died clutching her baby. She was then field dressed, packed out of the bush, cooked, and eaten. Her baby was being kept as a pet or possibly for sale to a passing trucker.

Ammann and I had arrived in Cameroon a week earlier to attend an upcoming conference on the growing commerce in "bushmeat," as game meat is called, and the role that the logging industry plays in facilitating the trade. The conference was to be held in a week's time in Bertoua, the capital of Cameroon's eastern province. With time on our hands, we had planned a foray to the frontline of the bushmeat business. After meeting Behrend in Yaoundé, the country's capital, we had taken the night train to Bertoua and the next day hired Alfred to take us south and east to Yokadouma to visit a logging concession. It was there we had heard about the orphan in Otoumoukad.

The traumatized eighteen-month-old baby was obviously close to death. "*Il est meéchant*," the owner cautioned us: "He's mean." Not surprisingly, the baby had nipped him several times. Behrend and I took a step back, leery that gorillas, like

chimpanzees, might harbor the Ebola virus. Two months earlier, thirteen villagers in Gabon had succumbed to Ebola after feasting on a dead chimp they had discovered in the forest. Investigators later found two dead gorillas near the village and were warning people in Gabon not to touch any dead animals or to shoot any game animal that was behaving strangely. The isolated outbreak had occurred less than 200 miles from where we were.

Ammann reached down to stroke the terrified infant, uttering a series of throaty pacifying vocalizations—"eh, eh, eh." The baby bared its teeth but instead of attacking hid its face behind upraised arms.

"That is one of the most distressing sights," said Ammann, emerging from the windowless hut into the blinding equatorial sun. The scene was all too familiar to him but still profoundly disturbing. In eight years of documenting the bushmeat trade in central and West Africa, he had encountered scores of orphan apes in similar straits: the unfortunates who had survived a hunter's shotgun blast and hadn't ended up in the pot themselves. Some he had managed to deliver to animal orphanages; most were doomed to live as pets—at least until they perished from malnourishment, disease, or depression. Freeing an animal into the wild is not an option, as an orphan cannot fend for itself.

"This one will live only a few more days," Ammann said, wiping the sweat and dust from his face. "Chimpanzees have the will to live if they're separated from their family, but gorillas fall into a depressive state and just give up on life." The baby's only chance of survival lay in transporting it to an animal sanctuary.

Next to chimpanzees, gorillas are our closest relatives. But the kinship of apes and humans did not, by itself, explain the depth of Ammann's anguish. In 1988, he and his wife, who live in the Kenyan highlands, had acquired a chimpanzee from a riverboat trader in Zaïre. The once sickly bushmeat orphan had blossomed into a robust, animated, playful adolescent, and Ammann dotes on him as he would an only child. As a surrogate parent, Ammann has gained insights into the nature of apes—and a compassion for them—that only someone who lives with animals can.

Adopting a chimpanzee changed the course of Ammann's life. A photographer whose work has resulted in three books on African predators and one on great apes, he undertook a crusade "to get the public riled up" about the growing commerce in bushmeat—specifically the meat of western lowland gorillas and chimpanzees, but also of such protected species as elephants, giant pangolins, and mandrills, rare baboons with vivid scarlet-and-blue facial markings. After eight years of trekking through West and central Africa, often enduring miserable conditions, he considers himself to be the world authority on bushmeat. "There are people who are experts in their own countries," he asserts, "but as far as range, no one has done the kind of investigating that I have."

He is utterly consumed by his cause. Blunt, impatient, and obstinate, he confesses to being a "loose cannon" among wildlife conservationists.

"Maybe I've become too extreme," confesses Ammann. "But let me take my message to the public: we are treating our closest relatives like pieces of protein."

Gorilla and chimpanzee meats have long been esteemed in many central and West African cultures for their flavor and spiritual and nutritional value. But in remote

forests where indigenous people used to hunt and trap sustainably, market hunters are now snaring and shooting every creature that walks, crawls, or flies.

"I have seen them selling fish eagles, bats, palm grubs, turtles, crocodiles, monitor lizards—anything that is protein," says Ammann. "In a hunting camp, I was once offered grilled African gray parrots to eat."

The demand for bushmeat is driven by numerous economic and cultural forces, but the supply, according to Ammann and other investigators, depends on one key factor: logging. Were it not for the expanding network of logging roads, hunters would not have such easy access to virgin hunting grounds or a convenient way to get their meat to market. Game that they preserve by smoking is picked up regularly by traders, or it moves on the steady stream of trucks hauling timber for export. Some of this meat is sold locally to loggers and villagers, but the engine of the bushmeat business is the urban consumer. Indeed, supply lines are so well established that in Yaoundé, Cameroon's capital, people can dine out on gorilla or elephant or, according to Ammann, order it for special occasions and receive home delivery, just like Christmas turkey. Notwithstanding his obsession with the subject, I found—after three weeks of traveling among Cameroon's major cities, villages, hunting camps, and jungle outposts like Otoumoukad—that very little of what Ammann told me was overstated.

For his part, Behrend had joined us to get a firsthand look at the bushmeat trade. But he was also looking for an issue to ignite public opinion against unsustainable logging—the "Chernobyl of the tropical timber trade," as Ammann put it. Behrend thought that bushmeat—or more precisely the plight of orphan apes—might be just the issue. After seeing the baby gorilla in the hut, I had little doubt that he was right.

When we met Behrend in Yaoundé, he had struck me as a character straight out of a Joseph Conrad novel. He was wearing a food-stained shirt, trousers with ragged cuffs, and a three-day stubble. But he was warm and articulate—and as passionate an advocate for the rain forest as Ammann was for apes. The three of us rolled out of the Yaoundé train depot at 5:00 P.M. in a first-class club car so thick with cigarette smoke that you could almost carve your initials in the air.

It was after midnight when we arrived in the town of Bélabo, which was pitch black except for the lights of the police station. We went straight there to report being robbed. A washed-out bridge halfway to Bélabo had forced us to disembark from the train and walk a mile to the opposite side of the break, where a second train awaited us. It was on this trek—swept along by a tide of jostling, shoving, yelling passengers—that light-fingered thieves had lifted a Nikon F4 from Ammann's camera case and our train tickets from my shoulder bag. It looked as though our trip was going to be a rough one, which was just Ammann's style.

The duty officer at the station was brusque and irritated. His pistol and a scattering of bullets lay conspicuously atop his desk. As Ammann explained about needing a copy of the robbery report for an insurance claim, you could hear the wheels turning in the policeman's head. Rather than taking a statement, he announced that he was fining us 5,000 francs, or about $10, for traveling without tickets.

Ammann was not about to submit. Sometime around 1:00 A.M., the constable saw that it was hopeless. He suddenly remembered some urgent business and swept out of the station, directing his assistant to take a statement.

This gutsy, aggressive style has served Ammann well, but it has also resulted in tense moments. In Cameroon last year, with two television crews in tow (from the BBC and Britain's Channel 4), he asked the Ministry of Environment and Forests to seize an orphaned chimpanzee pet and deliver it to the Limbe Zoo and Wildlife Reserve Center on Cameroon's coast. Ammann and armed rangers from the ministry descended on an amusement park near Yaoundé to confiscate the chimp. But the influential park owner alerted a highly placed—and armed—friend that a foreigner had stolen his chimp and was trying to smuggle it out of the country.

Ammann was sitting alone in back of a car with the chimpanzee when the armed man accosted him. When Ammann refused to release the animal, the man drew his pistol and threatened to shoot them both. The day was saved when the rangers, cocking their rifles, came charging out of the ministry building and chased the man off.

"That was something I don't want to go through again," says Ammann. "But the incident gave us credibility as people of action, rather than some guys sitting in their office making promises that are never kept." It also persuaded the amusement park owner that WSPA was well intentioned. He has since offered to donate land for an ape sanctuary provided that WSPA builds the facilities, which it is considering.

Ammann's main purpose for traveling to Bertoua and beyond was to speak at the bushmeat conference, which WSPA was cosponsoring with a Cameroonian group called Enviro-Protect. Every major logging operator had been invited to the conference, along with national and provincial officials, conservationists, nongovernmental organizations, and law enforcement authorities. The conference was a milestone, for it marked the first time that the connections between the bushmeat trade and the logging industry would be addressed in such a public forum in Africa.

For Ammann and WSPA, the seminar was evidence of their campaign's effectiveness. At a presentation to a European Parliament committee in December 1995, he and WSPA's directors distributed a graphic sixteen-page brochure entitled "Slaughter of the Apes: How the Tropical Timber Industry Is Devouring Africa's Great Apes." Illustrated by some of Ammann's most disturbing photographs, it depicted severed gorilla heads on the forest floor, chimpanzee arms blackened and contorted from smoking, and one heart-rending image of a half-dead orphan gorilla lying in a filthy suitcase for transport.

At a subsequent meeting of Afro-Caribbean-Pacific nations and the European Union, 140 delegates passed a resolution urging action, a move that reportedly embarrassed Cameroon's highest leadership. The Bertoua conference was approved not long afterward. But whether the government was genuinely concerned or just paying lip service remained to be seen.

The region we were entering was once among the largest expanses of rain forest in central and west Africa. To the south and east of Bertoua lay a great basin of forest and swamp drained by the Sangha and Ubangui Rivers, which feed the mighty Zaïre. My well-worn Michelin map indicated that the area abutting the Sangha was mostly

wilderness. It appeared as a broad field of green uncluttered by roads and place names and was enticingly labeled *Pygmées*.

But the map was dated. In the eighteen years since its publication, the contiguous forests of Cameroon, Congo, Gabon, and the Central African Republic have increasingly come under siege by battalions of *chasseurs*, or "hunters," and chainsaw-wielding *abatteurs*, a word that translates as either "tree fellers" or "slaughterers." Hundreds of tiny settlements have sprouted up since 1978, established villages have doubled or tripled in size, and a network of bulldozer tracks had penetrated the green void on my map.

Still, the region's extreme isolation has afforded it some protection. The expense of building roads and transporting logs to market dictates that only the most valuable hardwoods can be profitably exploited, species with such lyrical names as *ayous, moabi, sapelli*, and *wengwe*. Such selective logging of the most desirable trees is not automatically detrimental to wildlife. Research in Zaïre and the Central African Republic suggests that gorillas may actually find more of their favored foods in moderately disturbed forests than in virgin ones. Similarly, in Uganda, blue monkeys and black-and-white colobuses thrive in selectively logged forests, because the fruiting trees that they prefer tend to colonize a regenerating habitat.

Where logging is heavy, animal populations fall into steep decline. But in the remotest jungles of West Africa, habitat loss is less of a concern than is hunting pressure. That is the conclusion of a 1991 report on the Sangha region of Congo, just across the border from where we were heading. There researchers discovered that the population of primates in one selectively logged concession was "exceedingly low."

"We believe this is not a direct consequence of canopy reduction," wrote principal author David S. Wilkie, of Tufts University, "but results from the extremely intensive market hunting that coincides with timber surveying and extraction." The study predicted that the combined effect of logging, market hunting, and an ever-growing demand for bushmeat by urban dwellers would have "grave consequences" for the region's wildlife.

Large animals affect the forest's structure as well. "Gorillas are the gardeners of the rain forest," says Purdue University anthropologist Melissa Remis, who has studied gorilla ecology in the Central African Republic. "They actively prune trees when they're foraging, which shapes the habitat in ways that aren't fully known." Belgian agroforester Pauwel De Wachter, who studies hunting and shifting agriculture in Cameroon's Dja Faunal Reserve, explains that elephants play a similar role. Because of the amount of food they eat and the distances they range, their removal, says De Wachter, "would have a huge impact on biodiversity."

The Dja reserve contains an estimated 2,000 gorillas and 1,000 elephants. Those and other endangered populations could crash within the decade, De Wachter believes, unless income-producing alternatives to market hunting are introduced. These might include initiating agricultural and ecotourism projects, paying the villagers to survey animal populations, and giving the hunters jobs as antipoaching game wardens.

"Hunting need not be a negative force," says De Wachter. "Subsistence hunting will always exist, but if it is done sustainably it is not harmful."

Gauging the impact of market hunting on particular species is an imprecise science, a matter of comparing estimates of population size to estimates of the numbers of animals killed. Consider the western lowland gorilla, a species so cryptic that Remis went three years without ever getting closer than sixty-five feet to her study group when they were on the ground. An extrapolation of a 1985 census in Gabon puts the total western lowland gorilla population at 100,000 (outnumbering the mountain gorilla by a factor of 100). But Remis challenges the figure. "Many of us think it's too high because of deforestation and agriculture," she says. "I think 50,000 is a safer figure."

If gorilla population statistics are open to debate, those on hunting pressure are downright vague. Ammann believes that the number of lowland gorillas killed "must be measured in the thousands." After his 1995 reconnaissance of southeastern Cameroon's Kika–Moulundu–Mabelele triangle, he estimated that 800 gorillas were being killed annually in the 6,000-square-mile area. But his calculations involve much guesswork and extrapolation; they're based on hearsay about hunting success rates and on shotguns in use.

To trace the flow of meat leaving one concession in the Sangha region. David Wilkie's team went to a tract being logged by the Société Forestière Algéro-Congolaise. The daily routine began at dawn. Leaving for work, the loggers picked up a BaNgombe hunter and gave him a shotgun and three cartridges. The arrangement was that if the hunter bagged three animals, he could keep one. The man hunted all day and in the evening was driven to a village where his kills were smoked for shipment. A Société truck making the rounds to villages collected the meat, which was taken by pirogue across the river to Cameroon or downstream to Ouesso, the commercial nexus of northern Congo. From there, bags of bushmeat were loaded on commercial flights to Brazzaville or, in Cameroon, transported on logging trucks. In addition, loggers returning home to cities would bring bushmeat to families and friends nostalgic for the country life and the evocative flavor of game.

Two years ago in Ouesso, an observer for the Wildlife Conservation Society documented an average of 12,500 pounds of bushmeat moving through the city's markets each week. Duiker was the most prevalent, but also on sale were seven species of monkeys, eight other species of antelope, chimpanzees, elephants, and gorillas (an average of 1.6 per week). A market survey in Gabon put urban consumption of bushmeat at four million pounds a year and about the same in rural areas. Two gorillas and three chimps were openly displayed that year in one of the markets monitored, but more meat was likely being sold under the counter, as both species are technically contraband.

The notion of finding gorilla or chimpanzee on sale was macabre but fascinating to me, and I had resolved to conduct my own informal market surveys as we moved across Cameroon. In Yaoundé, with the train service interrupted, the pickings had been slim at the bushmeat market near the depot: only a few smoked monkeys, a live baby crocodile, a turtle, and a primate of some sort, charred black and cut lengthwise, with half its face frozen in a hideous grimace.

Not until Bertoua did I find what I was looking for. Strolling the aisles of the bushmeat section in the city's sprawling bazaar one morning. I came across a vendor

selling smoked gorilla meat and doing a brisk business. "The animal came from around Yokadouma," she explained, whisking away the flies. The meat was butchered and unrecognizable as gorilla, but it smelled appetizing, something like smoked lamb or beef, and was very lean. A mound of chunks weighing five ounces cost 250 francs (about 50 cents).

The price was the same as for porcupine, python, giant pangolin, and monkey available in nearby stalls. I found that puzzling. If gorilla was such a delicacy, why wasn't it priced accordingly? (In Yaoundé, Ammann had told me, it was twice the price of beef.)

"My customers don't express a preference for gorilla," the woman explained. "They buy whatever I have to offer. To them it's all just meat."

We had not slowed down since arriving in Cameroon. Ammann's pace and stamina were superhuman. He led us on a fifteen-mile forced march through the jungle to see an orphan chimp in a village just outside the logging tract, only to find that the animal had died the week before. And until we learned about the orphan gorilla of Otoumoukad from Pierre's men, he had been insistent about going off on another trek to find a band of hunters who had recently speared an elephant.

"Karl," Behrend told him in a steady voice, "you have to set your priorities. You can't do everything in one life."

When we reached Otoumoukad and saw the pathetic baby gorilla in the dark hut, Ammann quickly put aside his own distress. He ran outside, loaded his cameras, and plunged into the hut again. The infant was still grinding its teeth and hiding its face, but it was now slumped on its side. It appeared to have suffered a dislocated hip or broken leg. The only hope was to try to get it to the Limbe Zoo, which was 400 miles away.

Alfred, our driver, returned just then, beaming about having located the car's missing grill undamaged. We all jammed into the car, with Behrend in the back seat cradling the gorilla, and drove off in a swirl of dust. Back at our camp, we fed the baby condensed milk and bananas, zipped him into the hammock, and with all the village children following us, repaired to the nearby river for a swim. It was the first time we had relaxed in two weeks.

That night, the villagers staged a joyous celebration of song and dance. The revelry went on until 2:00 A.M. In the morning we trekked back to the stockyard with the gorilla, whom we had named Boumba after the river. Pierre agreed to keep him until someone could fly out from the Limbe Zoo.

Boumba seemed much improved, and the villagers were treating him with tender solicitousness. That was a remarkable change for them. "If I had seen that animal a week ago," our guide confessed sheepishly, "I would have killed and eaten it." Now he was handfeeding Boumba like his own baby, carefully blowing on bits of boiled cassava to cool it. We left Boumba zipped in his hammock, bright-eyed and gnawing on a baguette and a banana amid the pandemonium of rumbling skidders and screaming chain saws.

During our three days in the logging concession, we had seen little evidence of commercial hunting—no hunting camps and only one hunter carrying four white-nosed

guenons that he hoped to sell to a bush restaurant. Even the locals were not having much luck finding prey because of the racket caused by the logging operation.

The situation at our next stop, the market hunters' camp, was markedly different. It had taken another ten torturous hours of driving to get there. Ammann and I parted company with Behrend at the camp, sending him on to Yaoundé with Alfred, who would return for us in two days.

We were now about three hours south of Bertoua, deep in a logging concession run by the giant French concern Société d'Exploitation des Bois du Caméroun. Eight mud-and-wattle shacks flanked an abandoned logging track, chickens scratched in the dust, and dogs sniffed piles of garbage. Twenty people lived there. The chief hunter was a thirty-seven-year-old named Joseph Melloh, who spoke English so rapidly I could barely understand him. He had tried to earn a living as a storekeeper and a gasoline smuggler, but poverty had forced him back to the bush to hunt.

"In school I read the diaries of Mungo Park and *The Adventures of Huckleberry Finn*," he explained. "I thought if these men can have their adventures, I can have mine too, so I came here." Hunting was a pure life (he neither smoked nor drank) but not an easy livelihood. When he first came to the concession in 1984, he was the only hunter; a dozen years later, more than 200 men were competing for his turf. In a good week, hunting hard, he might earn 50,000 francs, or about $100.

"Today we will go to the forest for our adventure!" he said brightly in the morning. We set out with an apprentice hunter, Jean-Riche, who carried a handsome, French-made 12-gauge shotgun, one of two that Joseph leased for about $5 a week. Joseph carried just three cartridges, two of them chevrotines. "Today we will find gorilla," he said.

Gorillas are by far the preferred prey because of their weight. Smoked, each is worth about $40, whereas a chimp might earn $20, and a monkey, about $5. "People like gorilla very much," Joseph explained. "It tastes sweet like elephant and monkey. At Christmas, my customers want gorilla so much."

Apart from its festiveness, gorilla meat is reputed to have potent spiritual qualities. "If you and your wife eat it from the time that she becomes pregnant," Joseph continued, "the baby will be smart enough to go to university. Some people will dry the gorilla's hand, grind it up into powder, and put it in the baby's bathwater. Then the child will grow up to be strong."

We followed a path for two miles, three, four. Jean-Riche stopped at one point and made a popping sound by clapping his palm over his pursed lips to lure a gorilla. Again no luck. Trooping deeper into the forest, I gave up any thought of seeing gorillas. There were no signs of them anywhere.

Suddenly, Joseph froze. A commotion of chattering drew his attention. He motioned for us to stay put. He and Jean-Riche slipped off their shoes and waded into the bush. Moments later, another boom, then silence. When the pair returned, Jean-Riche proudly showed his kill: a gray-cheeked mangabey, shot dead between the eyes.

I kept my distance as we trekked back to camp, watching the blood drip from the monkey's wounds onto Jean-Riche's badly scratched legs. Sooty mangabeys are a reservoir of a retrovirus called SIV sm, which is related to HIV-2 and which was probably transmitted to humans through blood exposures of the sort that occur when hunters butcher meat—or carry dead mangabeys. (A strain of HIV-1 called Type O,

first seen in Cameroon, may have emerged in a similar fashion but from chimpanzees.)

Joseph's ankles were badly swollen when we reached camp. Some days he walks thirty miles, then hunts by night as well, spotlighting prey with an improvised headlamp. Ammann estimates that the camp has claimed 200 gorillas in the past three years. It also runs three traplines that catch everything from pangolin to duiker to leopard. One leased shotgun reportedly was used by several hunters to kill eleven elephants. But on this day, Joseph's and Jean-Riche's return for six hours of walking was one mangabey, worth perhaps $5.

I was greatly relieved to leave the desperate atmosphere of camp and return to Bertoua for the bushmeat conference. The meeting was well attended, except by loggers, who boycotted it. Ammann and the WSPA came under fire for the "Slaughter of the Apes" brochure. "When Europeans read this, I would not be surprised if Cameroon's timber is banned," said Dieudonne Nguele, the provincial representative of the Ministry of Environment and Forests. "The timber industry is a key source of income at this stage in our development. If there is a ban, what will replace this industry?"

"If we ban bushmeat, we will help the animals but harm people who have no alternative," said Nguele, voicing a prevalent opinion. "Sometimes a government must close one eye." He had showed the WSPA brochure to his father, who responded, "What the hell am I going to eat? What about the people?"

That was Joseph Melloh's question, too. Ammann had invited him to Bertoua to discuss "Project Joseph," a plan to start a gorilla ecotourism outfit, with him as head tracker. Joseph was interested. "As soon as I have another way to make a living," he said, "I will forget about bushmeat and hunting. I have no future now."

After mulling over the plan, however, Joseph turned cynical. His worry was for eating today, not conserving wildlife for tomorrow. "People tell me, 'Don't hunt gorilla, chimpanzee, pangolin,'" he said. "Why should I not shoot these animals? They're meat. They're plentiful. In Cameroon, there are a million gorillas. Three weeks ago, I saw sixty in one day. I shot three and then stopped. When I wound a gorilla and he runs away, I feel very sad—sad for me. Why should I feel bad for a gorilla? He is just a stupid animal."

We phoned from our hotel in Bertoua to try to arrange Boumba's transfer to the Limbe Zoo. The telephone lines to Limbe and Yokadouma were down. Ammann left messages for the zoo director, but he could not reach Pierre, who was to have met us at the conference. By the final day, Pierre still had not arrived.

As we were checking out of our hotel, Ammann's call to Yokadouma went through. Remarkably, Pierre was at home. He had skipped work to care for Boumba, who had stopped eating, developed severe diarrhea, and grown listless. Pierre had summoned his personal physician, but it was too late. Boumba had died that morning, an hour before our call.

Managing the Environment

This section takes a closer look at the social institutions involved in public and private ecological initiatives. Following Escobar's recommendation (Section 4), this section considers the growing controversies surrounding the rights and competencies of particular groups to manage environmental resources. These groups include government agencies, local and international nongovernmental groups, local and multinational businesses, environmental activists, and the scientific community. This section, thus, considers the intersection of global and local from an institutional perspective.

What is globalization? Does it affect everyone equally? What is globalization's relationship to notions of governance? This section begins to answer these questions, first, with Luke's application of Michel Foucault's writing on the links among power and knowledge and language. Luke applies Foucault's ideas to the work of a global environmental watchdog organization, the Worldwatch Institute. The selections that follow look at environmental management from different levels and logics of governance. Environmental historian Libby Robin, in an Australian example, describes the history of tensions between professional ecologists and activist greens. These conflicts center on who will influence Australian environmental policies and reveal different interpretations of environmental problems. Then, Susan Stonich and Billie Dewalt use a "political ecology" approach to consider how the hierarchy of institutions surrounding Honduran natural resources affects environmental degradation. In Stonich and DeWalt's writing, political ecology examines how the actions of people in powerful institutions, such as government agencies, affect local environments.

Anthropologists increasingly investigate local organizations, contrasting their work with that of global institutions like the World Bank, the International Monetary Fund, and the World Trade Organization. In his contribution, Akhil Gupta describes how Indian farmers respond to global hierarchies that place local groups at a disadvantage. Gupta frames global organizations by emphasizing the divide between wealthy countries located in the northern hemisphere (the North) and developing countries in the southern hemisphere (the South).

Discussions about environmental management are overtly based in politics and the economy, so in this section's polemical pieces, advisors to Al Gore's presidential campaign argue for continued U.S. involvement in global institutions, partly because they believe global environmental degradation now poses a security threat to the United States. The authors offer specific policy prescriptions for how that involvement might

take place. Finally, environmental philosopher Kristin Shrader-Frechette argues against both the individualism of capitalist economics and the ecological holism proffered by sustainable development theorists. Shrader-Frechette promotes a third path she believes is both feasible and ethically defensible.

On Environmentality

*Geo-Power and Eco-Knowledge in the Discourses of
Contemporary Environmentalism*

Timothy W. Luke

This study examines how discourses of nature, ecology, or the environment, as disciplinary articulations of "eco-knowledge," might be reinterpreted as efforts to generate systems of "geo-power" over, but also within and through, Nature for the governance of modern economies and societies. The thinking of Michel Foucault, particularly his notions of sexuality and bio-power as mediations for discursively formed discipline, provides a basis for this reinterpretation, because many of the terms associated with "the environment" are perplexing until one puts them under a genealogical lens. These dynamics have been at play for nearly a hundred and thirty years—or at least since self-consciously ecological discourses were formulated by George Marsh (1885) or Ernst Haeckel (1866) in the nineteenth century—but their operations are particularly apparent today.

While many examples of such tendencies might be mobilized here, this examination of geo-power systems as a mediation of environmentality will center upon only one—the work of the Worldwatch Institute. The continuous attempt to reinvent the forces of Nature in the economic exploitation of advanced technologies, linking structures in Nature to the rational management of its energies as geo-power, is an ongoing supplement to the disciplinary construction of various modes of bio-power in promoting the growth of human populations (Foucault, *History of Sexuality* I 140–41). Directed at generating geo-power from the more rational insertion of natural and artificial bodies into the machinery of production, discourses of environmentality can be seen fabricating disciplinary environments where power/knowledge operate as ensembles of geo-power and eco-knowledge.

In and of itself, Nature arguably is meaningless until humans assign meanings to it by interpreting some of its many signs as meaningful (Bramwell, Eckersley). The outcomes of this activity, however, are inescapably indeterminate. Because different human beings will observe its patterns, choosing to accentuate some while deciding at the same time to ignore others, Nature's meanings always will be multiple and unfixed. Only these interpretive acts can construct contestable textual fields, which

can then be read on various levels of expression for their many manifest or latent meanings. Before technologies turn its matter and energy into products, Nature already is transformed discursively into "natural resources." And, once it is rendered intelligible through these discursive processes, it can be used to legitimize almost anything. Therefore, this analysis will look into the discursive uses and conceptual definitions of some common theoretical notions, like "the environment," "environmentalism," and "environmentalist," to reconsider how many contemporary environmentalists are giving a new look to "the environment," as a concept, by transforming its identity in the practices of "environmentality." Finally, as these preliminary navigational bearings indicate, doubts are raised here about the apparently benign intentions of environmental actions, given the disciplinary propensities of the practices embedded in this new regime of environmentality.

For more concrete evidence to justify such caution, this study of geo-power and eco-knowledge will look at the work of the Worldwatch Institute. Established in 1974 amidst the economic and political panic sparked by the OPEC oil crisis of 1973, the Worldwatch Institute might be dismissed as just another nest of D.C. policy wonks, turning out position papers on water scarcity, reforestation, windmill economics, and overpopulation. This image of the Worldwatchers is accurate, but incomplete. And, given this incompleteness, worldwatching ought not to be quickly ignored or easily dismissed. Such activities can be the essence of power/knowledge formation, because much of what policy wonks do basically boils down to defining, creating, and enforcing discursive regimes of disciplinary truth. Consequently, this analysis carefully re-reads one recent Worldwatch Institute publication, *Saving the Planet: How to Shape an Environmentally Sustainable Global Economy* (1991) by Lester Brown, Christopher Flavin, and Sandra Postel, to illustrate how the eco-knowledge generated by the Worldwatch Institute might be seen as a mediation of environmentality in a new regime of geo-power.

Eco-Diction: Making Nature Speak as "Environment"

Many individuals who are intent upon turning the world into "a better place to live" often turn today to "the environment" in order to make their improvements. Believing that they must do anything and everything to protect "the environment," they transform this undertaking into a moral crusade. Their struggles, however, are often hobbled by a fundamental lack of clarity about what "the environment" actually *is*. This lack of certainty or centeredness in the meaning of environments is intriguing, because so many contemporary ecological discourses articulate their visions of moral value, political organization, and social control by stressing the salience of solving "environmental problems" for contemporary society.

"Environment," "environmentalism," and "environmentalist" are words used and accepted so broadly now that it is difficult to remember how recently they came into such wide currency. Before 1965, their use in ordinary discussions actually was quite rare in most policy discourses. More suggestive terms, like "Nature," "conservation," or "ecology," typically were deployed in making references about the characteristics of

the environmental. Now, a generation later, in the 1990s, Nature in these discourses occasionally will speak as "Nature," but increasingly its presence is marked as "the environment." This twist is interesting inasmuch as the various meanings of Nature, while remaining fully contestable, are somewhat clearer than a generation ago. At the same time, the meanings of the "environment," which are essentially uncontested, remain very unclear. Documenting this shift in usage is not an exact practice, but to start, one might look briefly through newspaper indices or expert discourses to develop a sense of the shift.

In 1960, or the year Rachel Carson's *New Yorker* essays on how pesticides were despoiling wildlife first drew broad public attention, there is only one story in *The New York Index* about environmental science, and it ties the topic to "astronautics." Five years earlier, in 1955, the word is not even registered in the index, but by 1965 there are four entries about "the environment," one of them about a speech by President Johnson on the need for greater efforts at conservation and beautification in preserving the environment. By 1970, there are almost two and a half entire pages of citations. And, more importantly, the concept remains a significant feature in the index during every year after 1970: one and two-thirds pages in 1975, one and a third in 1980, two pages in 1985, and three and a third in 1990. Even though increasing attention is being allotted in *The New York Times* to concerns that are broadly labeled as "environmental" or "environmentalistic," what "the environment" means to the press is much less clear. It encompasses Nature, conservation, and ecology as well as pollution, deforestation, and contamination.

Despite all of the talk about its central importance, "the environment" constantly escapes exacting definition, even in expert "environmentalist" discourses. For almost any given ecological writer, the significance of the environment and environmentalism is now apparently assumed to be so obvious that precise definitions are superfluous. ReVelle and ReVelle in their text *The Environment: Issues and Choices for Society* (1988), for example, name their book after the environment, but they fail to include any definition of what it means in their book's glossary or analysis. Buchholz in *Principles of Environmental Management: The Greening of Business* (1993) does not define the environment as a vital concept in ecology, even though he recounts standard dictionary definitions, presenting it as the surroundings that are natural organisms' ecological settings (29–30). When the environment is defined by experts, it basically encompasses everything.

Interestingly, this tendency also marks the work of explicitly political analyses of the environment (Paehlke). Even Barry Commoner, whose political thinking on environmental problems from the 1960s through the 1990s has won wide respect, takes this analytical path. Commoner does not directly confront the concept of the environment; instead, he divides Nature into "two worlds: the natural ecosphere, the thin skin of air, water, and soil and the plants and animals that live in it, and the man-made technosphere," which now has become

> sufficiently large and intense to alter the natural processes that govern the ecosphere. And in turn, the altered ecosphere threatens to flood our great cities, dry up our bountiful farms, contaminate our food and water, and poison our bodies—catastrophically diminishing our ability to provide for basic human needs. (*Commoner* 7)

Ultimately, Commoner depicts these two worlds as being "at war." As humans in the technosphere disrupt the ecosphere, the ecosphere responds with equally or more disruptive secondary effects in the technosphere. In some sense, the environment is "Nature" for Commoner, but it is also "Society," or, more accurately, Nature-as-transformed-by-Society. The prospect of something like "geo-power," in turn, is foreshadowed by expert intellectual interventions typified by his critiques. In fact, geo-power might be seen as the means of productively fusing the technosphere with the biosphere through the right codes of eco-knowledge.

This curious absence of clear definition can be tracked back beyond Commoner to Carson's original call for greater environmental awareness. *Silent Spring*, as it appeared in *The New Yorker* in 1960, and as a book in 1962, largely directed its analysis at "the web of life" rather than "the environment." Still, in reexamining how unregulated application of chemical pesticides adversely affected biotic communities in the world's overlapping and interconnecting food chains, Carson constructed a provisional reading of "the environment." That is, some substances from the technosphere (chemical pesticides) were invented to kill something in the biosphere (animal pests). While their application was intended to control only those animals that ate crops, carried disease, and infested dwellings, their impact was much broader. Pesticides soon spread through everything in the ecosphere—both human technosphere and nonhuman biosphere—returning from the "out there" of natural environments back into plant, animal, and human bodies situated at the "in here" of artificial environments with unintended, unanticipated, and unwanted effects. By using zoological, toxicological, epidemiological, and ecological insights, Carson generated a new sense of how "the environment" might be seen. However, she never based her analysis directly upon a formalized notion of "the environment" or "environmental damage."

Of course, any concept, like "the environment," "environmentalism," or "environmentalist," can be deployed as indistinctly as all of these patterns of use indicate. In noting how the words are used, one sees what we might ordinarily expect: namely, that they tend to mean various things to many people in several different contexts. Another approach to the problem would be to develop a provisional genealogy of the term's early origins to reveal other more embedded understandings of "the environment" that could be more suggestive than the sense of "environment" which encompasses *all* surroundings, *every* factor that affects organisms, the *totality* of circumstances, or the *sum* complex of conditions. A return to the semantic origins of environment, then, might illuminate some of these ambiguities and clarify how environmentalistic concepts actually work in the present.

On Environing

Perhaps the early origins of "the environment" as a concept—its historical emergence and original applications—might prove more helpful. In its original sense, which is borrowed by English from Old French, an environment is an action resulting from, or the state of being produced by a verb: "to environ." And environing as a verb is, in fact, a type of strategic action. To environ is to encircle, encompass, envelop, or enclose. It

is the physical activity of surrounding, circumscribing, or ringing around something. Its uses even suggest stationing guards around, thronging with hostile intent, or standing watch over some person or place. To environ a site or a subject is to beset, beleaguer, or besiege that place or person.

An environment, as either the means of such activity or the product of these actions, now might be read in a more suggestive manner. It is the encirclement, circumscription, or beleaguerment of places and persons in a strategic disciplinary policing of space. An environmental act, in turn, is already a disciplining move, aimed at constructing some expanse of space—a locale, a biome, a planet as biospherical space, or, on the other hand, some city, any region, the global economy in technospherical territory—in a discursive envelope. Within these enclosures, environmental expertise can arm environmentalists who stand watch over these surroundings, guarding the rings that include or exclude forces, agents, and ideas.

If one thinks about it, this original use of "the environment" is an accurate account of what is, in fact, happening in many environmental practices today. Environmentalized places become sites of supervision, where environmentalists see from above and from without through the enveloping designs of administratively delimited systems. Encircled by enclosures of alarm, environments can be disassembled, recombined, and subjected to the disciplinary designs of expert management. Enveloped in these interpretive frames, environments can be redirected to fulfill the ends of other economic scripts, managerial directives, and administrative writs. Environing, then, engenders "environmentality," which embeds instrumental rationalities in the policing of ecological spaces.

Environmentality and Governmentality

These reflections on "the environment" reframe its meanings in terms of the practices of power, allowing us to turn to Michel Foucault for additional insight. The bio-power formation described by Foucault was not historically closely focused upon the role of Nature in the equations of biopolitics (Foucault, *History of Sexuality* I 138–42). For Foucault, the whole point of the controlled tactics of inserting human bodies into the machineries of industrial and agricultural production as part and parcel of strategically adjusting the growth of human populations to the development of industrial capitalism was to bring "life and its mechanisms into the realm of explicit calculations," making the disciplines of knowledge and discourses of power into many agencies as part of the "transformation of human life" (143). Once this threshold of bio-power was crossed, human economics, politics, and technologies continually placed all human beings' existence into question.

Foucault notes that these industrial transformations implicitly raised ecological issues as they disrupted and redistributed the understandings provided by the classical episteme of defining human interactions with Nature. Living became "environmentalized," as humans related to their history and biological life in new ways from within growing artificial cities and mechanical modes of production, which positioned this new form of human being "at the same time outside history, in its biological

environment, and inside human historicity, penetrated by the latter's techniques of knowledge and power" (143). Here we can begin to locate the emergence of "the environment" as a nexus for knowledge formation and as a cluster of power tactics. As human beings began to consciously wager their life as a species on the outcomes of these biopolitical strategies and technological systems, it became clear that they also were wagering the lives of other (or all) species as well. While Foucault regards this shift as one of many lacunae in his analysis, it is clear there is much more going on here than he realizes. Once human power/knowledge formations become the foundation of industrial society's economic development, they also become the basis for the physical survival of all terrestrial life forms. Here, ecological analysis emerges as a productive power formation that reinvests human bodies—their means of health, modes of subsistence, and styles of habitation integrating the whole space of existence—with bio-historical significance by framing them within their various bio-physical environments filled with various animal and plant bodies.

Foucault can be read as dividing the environment into two separate, but interpenetrating spheres of action: the biological and the historical. For most of human history, the biological dimension, or forces of Nature working in the forms of disease and famine, dominated human existence with the ever-present menace of death. Developments in agricultural technologies as well as in hygiene and health techniques, however, gradually provided some relief from starvation and plague by the end of the eighteenth century. As a result, the historical dimension began to grow in importance as "the development of the different fields of knowledge concerned with life in general, the improvement of agricultural techniques, and the observations and measures relative to man's life and survival" averted some of the imminent risks of death (142). In other words, "the historical" starts to envelop, circumscribe, and surround "the biological." Hence, environmentalized settings emerged "in the space of movement thus conquered, and broadening and organizing that space, methods of power and knowledge assumed responsibility for the life processes and undertook to control and modify them" (142). While he does not explicitly define these spaces, methods, and knowledges as such as being "environmental," it appears that such maneuvers were crucial to the emergence of environmentalization. As biological existence was refracted through economic, political, and technological existence, "the facts of life" passed into fields of control for eco-knowledge and spheres of intervention for geo-power.

Environments then emerged with bio-power as part and parcel of the regulation of life via biopolitics, and, for nearly a century, ecology apparently remained another ancillary correlate of bio-power, inhabiting discourses about species extinction, resource conservation, and overpopulation. Until the productive regime of biopolitics became fully globalized (because Nature itself is not entirely encircled), ecology was a fairly minor voice in the disciplinary chorus organizing development and growth. Things changed, however, once the extensive expansionist strategies of development and growth employed in the eighteenth and nineteenth centuries collapsed around 1914, promoting conservationist ethics in Europe and North America that fretted over conserving resources for resource-driven intensive modes of production. And, as new mediations of development and growth were constructed after 1945, the geo-power/

eco-knowledge nexus of environmentalization came to comfortably supplement the high technology, capital intensive development strategies that have since been implemented.

Thus, the environment, if one follows Foucault's line of reasoning (105–06), must not be understood as the naturally given sphere of ecological processes which human powers try to keep under control, nor should it be viewed as a mysterious domain of obscure terrestrial events which human knowledge works to explain. Instead, it emerges as a historical artifact that is openly constructed, not an occluded reality that is difficult to comprehend. In this great network, the simulation of spaces, the intensification of resources, the incitement of discoveries, the formation of special knowledges, the strengthening of controls, and the provocation of resistances can all be linked to one another.

The immanent designs of Nature, when and where they are "discovered" in environments, closely parallel the arts of government. One might ask if the two are not inseparable in geo-power/eco-knowledge systems. As Foucault sees the arts of government, they essentially are concerned with how to introduce economy into the political practices of the state. Government becomes in the eighteenth century the designation of a "level of reality, a field of intervention, through a series of complex processes" in which "government is the right disposition of things" ("Governmentality" 93). Governmentality applies techniques of instrumental rationality to the arts of everyday management. It evolves as an elaborate social formation, or "a triangle, sovereignty-discipline-government, which has as its primary target the population and as its essential mechanism the apparatuses of security" (102).

Most significantly, Foucault sees rulers and authorities mobilizing governmentality to bring about "the emergence of population as a datum, as a field of intervention and as an objective of governmental techniques" (102) so that now "the population is the object that government must take into account in all its observations and *savoir*, in order to be able to govern effectively in a rational and conscious manner" (100). The networks of continuous, multiple, and complex interaction between populations (their increase, longevity, health), territory (its expanse, resources, control), and wealth (its creation, productivity, distribution) are sites of governmentalizing rationality to manage the productive interaction of these forces.

Foucault invites social theorists not to reduce all ensembles of modernizing development to the "statalization" of society wherein "the state" becomes an expansive set of managerial functions, discharging its effects in the development of productive forces, the reproduction of relations of production, or the organization of ideological superstructures. Instead he argues in favor of investigating the "governmentalization" of the economy and society whereby individuals and groups are enmeshed within the tactics and strategies of a complex form of power whose institutions, procedures, analyses, and techniques loosely manage mass populations and their surroundings in a highly politicized symbolic and material economy (103). Because governmental techniques are the central focus of political struggle and contestation, the interactions of populations with their natural surroundings in highly politicized economies compel states constantly to redefine what is within their competence throughout the modernizing process. To survive after the 1960s in a world marked by decolonization,

global industrialization, and nuclear military confrontation, it is not enough for states merely to maintain legal jurisdiction over their allegedly sovereign territories. As ecological limits to growth are either discovered or defined, states are forced to guarantee their populations' fecundity and productivity in the total setting of the global political economy by becoming "environmental protection agencies."

Governmental discourses methodically mobilize particular assumptions, codes, and procedures in enforcing specific understandings about the economy and society. As a result, they generate "truths" or "knowledges" that also constitute forms of power with significant reserves of legitimacy and effectiveness. Inasmuch as they classify, organize, and vet larger understandings of reality, such discourses can authorize or invalidate the possibilities for constructing particular institutions, practices, or concepts in society at large. They simultaneously frame the emergence of collective subjectivities (nations as dynamic populations) and collections of subjects (individuals) as units in such nations. Individual subjects as well as collective subjects can be reevaluated as "the element in which are articulated the effects of a certain type of power and the reference of a certain type of knowledge, the machinery by which the power relations give rise to a possible corpus of knowledge, and knowledge extends and reinforces the effects of this power" (Foucault, *Discipline and Punish* 29). Therefore, an environmentalizing regime must advance eco-knowledges to activate its command over geo-power as well as to re-operationalize many of its notions of governmentality as environmentality. Like governmentality, the disciplinary articulations of environmentality must center upon establishing and enforcing "the right disposition of things."

New Power/Knowledge

The Worldwatch Institute provides a curious instantiation of how regimes of environmentality might be seen at work in the processes of developing a geo-power/eco-knowledge formation. Taking the world as one ecological site, the Worldwatch Institute aptly typifies a green power/knowledge center in the play of current-day environmental politics. Seeing the path of untrammeled industrial development as the cause of environmental crises, a recent Worldwatch Institute book by Brown, Flavin, and Postel attributes the prevailing popular faith in material growth to "a narrow economic view of the world" (21). Any sense of constraint on further growth is cast by economics "in terms of inadequate demand growth rather than limits imposed by the earth's resources" (22). Ecologists, however, study the allegedly complex changing relationships of organisms with their environments, and, for them, "growth is confined by the parameters of the biosphere" (22). For Brown, Flavin, and Postel, economists ironically regard ecologists' concerns as "a minor subdiscipline of economics—to be 'internalized' in economic models and dealt with at the margins of economic planning," while "to an ecologist, the economy is a narrow subset of the global ecosystem" (23). To end this schism, the Worldwatch Institute pushes for melding ecology with economics to infuse environmental studies with economic instrumental rationality and defuse economics with ecological systems reasoning. Once this is done, the roots of economic growth no longer can be divorced from "the natural systems and resources

from which they ultimately derive," and any economic process that "undermines the global ecosystem cannot continue indefinitely" (23).

With this rhetorical maneuver, the Worldwatch Institute articulates its vision of geo-power/eco-knowledge as the instrumental rationality of resource managerialism working on a global scale. Nature, now reinterpreted as a cybernetic system of bio-physical systems, reappears among nation-states in those "four biological systems—forests, grasslands, fisheries, and croplands—which supply all of our food and much of the raw materials for industry, with the notable exceptions of fossil fuels and minerals" (Brown, Flavin, and Postel 73). As a result, the performance of these systems might be monitored in analytical spreadsheets written in bioeconomic terms, and then judged in equations balancing increased human population and highly constrained base ecosystem outputs. When looking at these four systems, one must recognize that Nature is merely a system of energy-conversion systems:

> Each of these systems is fueled by photosynthesis, the process by which plants use solar energy to combine water and carbon dioxide to form carbohydrates. Indeed, this process for converting solar energy into biochemical energy supports all life on earth, including the 5.4 billion members of our species. Unless we manage these basic biological systems more intelligently than we now are, the earth will never meet the basic needs of 8 billion people.
>
> Photosynthesis is the common currency of biological systems, the yardstick by which their output can be aggregated and changes in their productivity measured. Although the estimated 41 percent of photosynthetic activity that takes place in the oceans supplies us with seafood, it is the 59 percent occurring on land that supports the world economy. And it is the loss of terrestrial photosynthesis as a result of environmental degradation that is undermining many national economies. (73–74)

Photosynthetic energy generation and accumulation, then, is to become the accounting standard for submitting such geo-power to environmentalizing discipline. It imposes upper limits on economic expansion; the earth is only so large. The 41 percent that is aquatic and marine as well as the 59 percent that is terrestrial are actually decreasing in magnitude and efficiency due to "environmental degradation." Partly localized within many national territories and partly globalized as transboundary pollution, the system of systems needs global management—a powerful, all-knowing world watch—to mind its environmental resources.

Such requirements arise from the convergence of dangerous trends identified by such bioeconomic accounting:

> 40 percent of the earth's annual net primary production on land now goes directly to meet human needs or is indirectly used or destroyed by human activity—leaving 60 percent for the millions of other land-based species with which humans share the planet. While it took all of human history to reach this point, the share could double to 80 percent by 2030 if current rates of population growth continue; rising per capita consumption could shorten the doubling time considerably. Along the way, with people usurping an ever larger share of the earth's life-sustaining energy, natural systems will unravel faster. (74)

To avoid this collapse, human beings must stop increasing their numbers so rapidly, halt increasingly resource-intensive modes of production, and limit increasing levels of material consumption. All of these ends require a measure of surveillance and degree of steering beyond the modern nation-state, but perhaps *not* beyond some postmodern worldwatch engaged in the disciplinary tasks of equilibrating the "net primary production" of solar energy fixed by photosynthesis in the four systems. Natural resources in the total solar economy of food stocks, fisheries, forest preserves, and grass lands are rhetorically ripped from Nature only to be returned as environmental resources, enveloped in accounting procedures and encircled by managerial programs.

The Worldwatch Institute writers here are engaged in a struggle "for truth" in economic and environmental discourse. By simultaneously framing economics with the bad rap of growth fetishism and twinning ecology with the high purpose of documenting environmental interconnectedness, the Worldwatchers are striving to transform fields of knowledge as bands of power. Inasmuch as today's decentered networks of power operate through relations of truth "linked in a circular relation with systems of power which produce and sustain it, and to effects of power it induces and which extend it" (Foucault, *History of Sexuality* I 144), these discursive alterations are the requisite moves for prevailing in a disciplinary struggle for discursive authority. By shifting the authorizing legitimacy of truth claims used in policy analysis away from *economic* terms to *ecological* terms (as they are cast in these thermodynamic allusions), the Worldwatch Institute's experts are working to reframe the power/knowledge systems of advanced capitalist societies.

The Environment as Disciplinary Space

Environmentality, then, would govern by restructuring today's ecologically unsound society through elaborate managerial designs to realize tomorrow's environmentally sustainable economy. The shape of an environmental economy would emerge from a reengineered economy of environmentalizing shapes vetted by worldwatching codes. The individual human subject of today, and all of his or her unsustainable practices, would be reshaped through this environmentality, redirected by practices, discourses, and ensembles of administration that more efficiently synchronize the bio-powers of populations with the geo-powers of environments. Traditional codes defining human identity and difference would be reframed by systems of environmentality in new equations for making comprehensive global sustainability calculations as the bio-power of populations merges with the ecopower of environments. To police global carrying capacity, in turn, this environmentalizing logic bids each human subject to assume the much less capacious carriage of disciplinary frugality instead of affluent suburban consumerism. All of the world will come under watch, and the global watch will police its human charges to dispose of their things and arrange their ends—in reengineered spaces using new energies at new jobs and leisures—around these environing agendas.

Sustainability, however, cuts both ways. On the one hand, it can articulate a rationale for preserving Nature's biotic diversity in order to maintain the sustainability of the

biosphere. But, on the other hand, it also can represent an effort to reinforce the prevailing order of capitalistic development by transforming sustainability into an economic project. To the degree that modern subjectivity is a two-sided power/knowledge relation, scientific-professional declarations about sustainability essentially describe a new mode of environmentalized subjectivity. In becoming enmeshed in a worldwatched environ, the individual subject of a sustainable society could become simultaneously "subject to someone else by control and dependence," where environmentalizing global and local state agencies enforce their codes of sustainability, and police a self-directed ecological subject "tied to his own identity by a conscience or self-knowledge" (Foucault, "Afterword" 212). In both manifestations, the truth regime of ecological sustainability draws up criteria for what sort of "selfness" will be privileged with political identity and social self-knowledge.

Sustainability, like sexuality, becomes a discourse about exerting power over life. How power might "invest life through and through" (Foucault, *History of Sexuality* I 139) becomes a new challenge, once biopolitical relations are established as environmentalized systems. Moreover, sustainability more or less presumes that some level of material and cultural existence has been attained that is indeed worth sustaining. This formation, then, constitutes "a new distribution of pleasures, discourses, truths, and powers; it has to be seen as the self-affirmation of one class rather than the enslavement of another: a defense, a protection, a strengthening, and an exaltation … as a means of social control and political subjugation" (123).

The global bio-accounting systems of the Worldwatch Institute conceptually and practically exemplify the project of environmentality with their rhetorics of scientific surveillance. How Nature should be governed is not a purely administrative question turning upon the technicalities of scientific "know-how." Rather, it is essentially and inescapably political. The discourses of Worldwatching that rhetorically construct Nature also assign powers to new global governors and governments, who are granted writs of authority and made centers of organization in the Worldwatchers' environmentalized specifications of managerial "who-can" and political "how-to."

Instituting a Worldwatch: The Eco-Panopticon

Not surprisingly, then, the various power/knowledge systems of instituting a Worldwatch environmentality appear to be a practical materialization of panoptic power. The Worldwatch Institute continually couches its narratives in visual terms, alluding to its mission as outlining "an ecologically defined vision" of "how an environmentally sustainable society would look" in a new "vision of a global economy." As Foucault claims, "whenever one is dealing with a multiplicity of individuals on whom a particular form of behavior must be imposed, the panoptic schema may be used" (*Discipline and Punish* 205) because it enables a knowing center to reorganize the disposition of things and redirect the convenient ends of individuals in environmentalized spaces. As organisms operating in the energy exchanges of photosynthesis, human beings can become environed on all sides by the cybernetic system of biophysical systems composing Nature.

Worldwatching, in turn, refixes the moral specification of human roles and responsibilities in the enclosed spaces and segmented places of ecosystemic niches. And, in generating this knowledge of environmental impact by applying such powers of ecological observation, the institutions of Worldwatch operate as a green panopticon, enclosing Nature in rings of centered normalizing super-vision where an eco-knowledge system identifies Nature as "the environment." The notational calculus of bioeconomic accounting not only can, but in fact must reequilibrate individuals and species, energy and matter, inefficiencies and inequities in an integrated panel of globalized observation. The supervisory gaze of normalizing control, embedded in the Worldwatch Institute's panoptic practices, adduces "the environmental," or enclosed, segmented spaces, "observed at every point, in which the individuals are inserted in a fixed place, in which the slightest movements are supervised, in which all events are recorded, in which an uninterrupted work of writing links the centre and periphery, in which power is exercised without division, according to a continuous hierarchical figure, in which each individual is constantly located, examined, and distributed among the living beings, the sick and the dead" (Foucault, *Discipline and Punish* 197). To save the planet, it becomes necessary to environmentalize it, enveloping its system of systems in new disciplinary discourses to regulate population growth, economic development, and resource exploitation on a global scale with continual managerial intervention.

Many contemporary environmental movements, particularly those inspired by the Worldwatch Institute's analyses, push governmentality to a global rather than a national level of control. The biosphere, atmosphere, and ecosphere are all reintegrated into the truth regime of political economy to serve more ecological ends, but they are also made to run along new economic tracks above and beyond the territorial spaces created by nation-states. By touting the necessity of recalibrating society's logics of governmentality in new spatial registers at the local and global level, the geo-power politics of environmentality aim to rewrite the geographies of national stratified space with new mappings of bioregional economies knitted into global ecologies—complete with environmentalized zones of "dying forests," "regional desertification," "endangered bays," or "depleted farmland."

If Foucault's representation of governmentality accounts for the practices of power mobilized by centered national sovereigns in the era of capitalist modernization and national state-building after 1648, the Worldwatch Institute's approach to environmentality perhaps foreshadows the practices of power being adduced by multicentric alliances of transnational capital or loose coalitions of highly fragmented local sovereignties, following the collapse of the old Cold War competitions in the early 1990s. New spatial domains are being created in the world today, on the one hand, by pollution, nuclear contamination, and widespread rapid deforestation, and, on the other, by telecommunications, jet transportation, and cheap accessible computerization. Nation-states are not answering effectively the challenges posed within their borders by these new spaces. But a variety of new organizations in the contemporary environmental movement, like the Worldwatch Institute, Earth First!, The World Wildlife Federation, or Greenpeace, at least are addressing, if not answering, how these spaces are developing, what impact they have in today's political economy, and who should act to respond to the challenge. In the bargain, they also are interposing their own

environmentalizing conceptual maps, technical disciplines, and organizational orders on these spaces as they urge local citizen's groups or global supranational agencies to move beyond the constraints imposed by national sovereignty to construct new sustainable spaces for human habitation.

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Radical Ecology and Conservation Science
An Australian Perspective

Libby Robin

The political difficulty of undertaking conservation is always greatest when the imperative for economic development is at its most jingoistic. In 1950s Australia, the post-war development boom was in full swing. The population was growing rapidly, both through post-war births and through immigration. Between 1945 and 1960 the population rose from 7.3 million to 10.4 million, and it was a young population, a population 'with a future'.[1] The demand for housing materials, for example, seriously exceeded supply. Governments were actively encouraging people to build their own homes because of the shortages of skilled builders to meet the demand, and were requiring that such houses be limited in size to reduce demand on such basics as nails and timber.[2] The rhetoric encouraged individuals to make personal sacrifices in the interests of 'nation building'.

At the centre of 'national reconstruction' was a project to build a massive hydro-electricity scheme in Australia's highest mountains. The Snowy Mountains are in the south-eastern corner of the continent, strategically located between Australia's largest cities, Sydney and Melbourne, and rather closer to Canberra, the seat of national government. The hydro-electricity scheme was devised and managed by the Snowy Mountains Authority, a massive government agency with a brief to build a system of hydro-electricity stations (through both private and public funding). The complexities of the scheme were considerable as it straddled two states (New South Wales and Victoria) and the Australian Capital Territory, and had implications for a third state, South Australia, down-stream of the works. The states' co-operation was at least partly gained through the offer of 'free irrigation to farmers downstream' as a by-product.[3] The hydro-electricity scheme was rhetorically linked to national pride. It was associated with building secondary industry, something very important to a nation with a predominantly agricultural economy at the time. The 'Snowy Scheme' was the subject of jingoistic films, was promoted as a tourist attraction, and was an important 'topic' in the curriculum of school children in the eastern states. Newly arrived immigrants from war-torn Europe provided the work force for the scheme and were told by William (later Sir William) Hudson, the scheme's first commissioner: 'You won't be

Balts or Slavs … you will be men of the Snowy'.[4] Hudson's nationalistic rhetoric was typical of the time. The scheme was so 'Australian', its imprimatur was capable of giving new immigrants quick status as 'real Australians'. The scheme's overwhelming contemporary popularity and the subsequent perception of its 'success' is attributable, at least in part, to the capacity of the Authority to take advice at critical times. The young science of soil conservation, which offered significant (but not always popular) advice to the Authority, was important to the perceived success of the scheme in both engineering and in politics.

Australia, like the United States of America, had suffered massive soil erosion in the 1930s resulting in enormous ecological damage and personal suffering. Country people, like the 'Okies' in John Steinbeck's *Grapes of Wrath*, left the land for the cities. There was often deep shame felt by these people, especially those farming the small allotments issued to soldiers returned from the first world war, who felt they had failed personally. Some left their properties in the middle of the night without farewelling neighbours.[5] Government agencies for soil conservation were established in New South Wales in 1938 and Victoria in 1940, and while they were never big, in the 1950s they were taken seriously, as the nation's response to the massive agricultural disaster which had touched so many people.

The central story in this paper is about the role of science in mediating the nationalism inherent in both the grand engineering scheme and in the management of soil conservation. The science in the cross-fire was ecology.

'Ecology' first came to popular notice in Australia through nature study in the 1940s, and was often associated with romantic views on the 'web of life'.[6] Most practising ecologists of the time were quite comfortable with this type of popularisation. In the 1950s, ecological scientists were glad of a public profile. But by the 1970s, when the word 'ecology' came increasingly to mean politics rather than science, many scientific ecologists became disconcerted. They sought to distance themselves from the popular images of the subject, in particular the anti-science and anti-technology rhetoric of parts of the environment movement, and to reassert the scientific status of the discipline.[7]

This paper explores the role of science in the management of the environment through conservation and ecology. It focuses on the 1950s, what (in an American context) Gregg Mitman has described as a 'lost decade in environmental history'.[8] It is a decade which has been lost perhaps because of a perception that it was a time of 'political contentment and acquiescence in the system'.[9] But while the 1950s were a time when scientific understandings themselves were less closely scrutinised, there is no doubt that scientists were far from acquiescent in the 'system'. It was a formative period for many senior ecologists, and may, in subtle ways, still be shaping Australia's environmental debates.

The Institutional Structure of Scientific Ecology in Australia

Ecologists in Australia are generally sponsored by universities or government agencies, but not by the corporate or private sectors. Australia's scientists traditionally have

been forced by isolation to work as all-rounders rather than narrow specialists, and even academic scientists have rarely had the privilege of being funded for 'pure research'.[10] This pattern is particularly apparent in a discipline as small as ecology. Ecology is not prestigious in Australian universities. Ecology is generally regarded as a subset of Botany, Zoology, Biology, Environmental Science or even Forestry. It seldom stands alone as a teaching or research discipline. Ecological scientists who work in universities therefore have to be actively concerned about their image within their wider scientific departments.[11] There are a number of chairs in environmental science and biological sciences that have been held by practising ecologists, but the lack of named ecological chairs is a reflection of the fact that ecology is low in the hierarchical stakes in Australian universities.

Raymond L. Specht, himself a distinguished ecologist and former Professor of Botany at the University of Queensland, surveyed forty of his contemporaries who undertook postgraduate ecological studies in the period from 1930 to 1955.[12] He described a drift of ecologists away from ecology towards other fields as they get older. He noted that half of these opted out of field work, seventeen moving to taxonomy and three to plant physiology. Only seven of the early plant ecologists were still active in plant ecology in 1981. Four died relatively young, and the remaining nine took early retirement from university employment to pursue careers as environmental consultants. These figures are reminiscent of the trends in (or rather out of!) ecology in America thirty years earlier noted by the American historian of science, Eugene Cittadino, who described ecology as 'a young man's specialty'.[13] In addition to the hard physical requirements of field work, there is the question of time. Most senior university-based positions carry a heavy administrative and teaching load, making it difficult to undertake field work in distant places at the ecologically appropriate time. Universities in Australia are mostly located in large cities well away from interesting ecosystems, so few field sites can be reached with less than several hours' travelling time. Only a full-time researcher can undertake year-round studies on remote ecosystems. The fact that time and physical fitness are less available to senior academics serves to reduce the prestige of ecology in universities further, and to reinforce its status as a junior sub-discipline of something else.

The pragmatic construction of academic ecology as a sub-set of something else sits uneasily with the popular perception of ecology as an over-arching world view in environmental politics. At the turn of the century, the founders of scientific ecology saw the potential for the subject to have a broad scope. For example, the British physiologist J.S. Burdon-Sanderson in his presidential address to the British Association for the Advancement of Science in 1893 told the audience 'that "oecology" was one of the three great divisions of biology, along with physiology and morphology'.[14] But the way power is organised in universities and research institutions is by discipline, administered through chairs or directors, not by 'great divisions in biology'. At the pragmatic level, ecology is regarded in Australia as either too specialised or too general to be the central organisational focus of a department. University ecologists fight for their space and their research dollar in hostile departments. They have therefore sought and found allies outside university structures.

The most important allies for Australian ecologists historically have been government agencies, especially those charged with responsibility for natural resource management and land use. More ecologists have been employed by government conservation agencies than by universities.[15] The conservation agency sector has contributed significantly to ecological research in many fields. Such agencies have the structural arrangements that make it possible for long, intensive field trips in remote places at the 'right' ecological time (for example, during the relevant flowering or breeding season). The majority of positions for ecologists still come up in the government sector—in land-use management, forestry, national parks and soil conservation agencies. Universities provide a significant number of salaries, but frequently the research funding for these ecologists also comes from the government sector, and work so funded often has an applied or management dimension.

From the 1920s, South Australian university ecologists worked with the Waite Institute for Agricultural Research on the ecology of arid lands.[16] In the early 1940s, Victorian botanists were conscripted into alpine ecology by the Soil Conservation Board.[17] In the 1950s, the Snowy Mountains Authority became interested in alpine ecology through the mediation of the Soil Conservation Service of New South Wales. Ecology and conservation became synonymous and interchangeable terms.

A.B. Costin and Alpine Ecology in the 1950s

Alec Costin is arguably Australia's leading Alpine ecologist, but he is not an 'academic'. Costin's distinction in his field has been recognised by the prestigious Australian Academy of Science, of which he is a Fellow. But his career has been constructed almost entirely outside the university system: he worked for the Soil Conservation Service of New South Wales for eight years, the Soil Conservation Authority of Victoria for three years, and the Commonwealth Scientific and Industrial Research Organisation (CSIRO) for nineteen years.[18] His university affiliations were brief: two years as a scholar affiliated with Sydney University in the early 1950s and a visiting fellow at the Australian National University when in semi-retirement. The support for his fine basic and strategic research came almost exclusively from organisations with utilitarian management obligations. But it was only such organisations that could make ongoing structural allowances for the difficulty of travelling to and from the remote alpine regions where Costin often spent many weeks on field trips.

Costin's eminence in alpine science began with work in the 1940s and 1950s that provided much of the primary descriptions of vegetation communities and soil types of the Australian Alps, especially in the Mt Kosciuszko[19] area. His later analyses built on his descriptive ecology and included catchment hydrology, glaciology and Carbon-14 dating. His most important environmental management papers dealt with the key issue of grazing in the alpine areas. In the mid-1950s Costin was the leader in the move to end 'snow leases', the leases that privilege certain families to graze sheep and cattle in the country above the snow line. Some bushwalking groups had expressed concerns about overgrazing in the fragile alpine country, but the political campaign to remove hard-hooved animals from its delicate soil structures was spearheaded by

ecologists, especially those working for soil conservation agencies in Victoria and New South Wales. In Victoria, the pioneering ecologist Maisie Fawcett also succeeded in drawing political attention to the destruction of alpine ecosystems in the 1940s.[20] Fawcett's collaborator, John Turner, Professor of Botany and Plant Physiology at the University of Melbourne, who co-authored publications associated with the Victorian high-plains research, was also a great supporter of Costin and the environmental campaign for the Kosciuszko 'Tops' in the 1950s.

Costin was able to tackle snow leases more directly in New South Wales than Fawcett was in Victoria because he received strong support from the Snowy Mountains Authority. An enterprising Soil Conservation Service chief convinced the Authority that it had an interest in ensuring that soil drift did not threaten hydro-electric works.[21] Initially, in Costin's words, the Authority 'buggered up the country pretty well everywhere they went'.[22] But once the Snowy Mountains Authority decided that good soil conservation practices were in its interests, it not only softened its own approach to the environment, but it funded the CSIRO to establish an Alpine Ecology Unit at Island Bend, in the middle of its works. Costin was appointed as Senior Research Officer in CSIRO's Alpine Ecology Unit because of his experience in the analysis of alpine ecosystems, including those near the Authority's works, which he had studied for his postgraduate work, sponsored by the New South Wales Department of Agriculture. His credentials as an outspoken opponent of grazing in the high country may well have enhanced his attractiveness to the Authority.[23] The Authority wanted the snow leases ended ostensibly for the sake of water-catchments critical to its hydro-electric works.[24]

It was probably one of the best public relations exercises ever undertaken by such an authority. Not only did it take attention away from its own mistakes, it also served to point the finger at the local farmers as the 'poor land-users' who created environmental havoc by grazing hard-hooved animals on country that could not tolerate such treatment. 'Snow leases' have been central to environmental protests in Australia on and off ever since, especially in Victoria where the mountain cattlemen and cattlewomen (as they call themselves) still have limited use of the high country.[25] Yet, until recently, very few activists or scholars criticised the destruction of alpine environments caused by the Snowy Mountains Authority itself, which is on a much grander scale.[26]

The CSIRO 'Kosciuszko School', as the Alpine Ecology Unit is often called, has earned its right to the title 'School' because alongside its applied research brief, it has also provided leadership and support to many postgraduate students tackling ecological tasks in the high country.[27] Costin's first research focused on the Snowy Mountains Authority's needs, considering vegetation and soil management in relation to water yield in the alpine area.[28] The experimental plots he established in the 1950s are still monitored and are used for considering the effects of the latest problem land-users, the tourists, who now flock to Mt Kosciuszko and surrounding areas in thousands.[29] The soundly analysed plots have also provided longitudinal information which has backgrounded a range of other recent scientific investigations, including the effects of 'greenhouse' and cloud-seeding experiments.[30]

Ecology and Environmental Activism

The Snowy Mountains Authority's 'public relations exercise'—the Alpine Ecology Unit—was not, however, without its problems. A crisis came in the late 1950s when it proposed a dam on Spencers Creek, near the summit of Mt Kosciuszko. This was not an essential dam, but a minor independent project which could bring hydro-electricity into the New South Wales grid relatively quickly, whilst other works were in progress. It was important to the Authority as a way of convincing New South Wales sceptics of the value of the main scheme, but not essential to its success.[31] Spencers Creek did not have sufficient water in its own catchment for hydro-electric purposes, so the Authority proposed the building of aqueducts on both sides of the main range. Costin saw this proposal as a threat to continuing glaciological studies of the Mt Kosciuszko area.[32]

The building of aqueducts was also a violation of National Parks values set out in the *Kosciusko State Park Act* of 1944 and later amendments. This was in the days before a National Parks Authority existed, when each park was managed by a separate small committee. The Kosciusko State Park Trust, which had official control over the area, was simply a small band of nominees and never a strong organisation. Its power had been further eroded by its changing membership during the 1930s and 1940s.[33] Costin and a number of other senior scientists put pressure on the Kosciusko State Park Trust to declare up to ten percent of the land in its care a 'primitive area'. Such a decla-ration would legislatively preclude intrusions like aqueducts. Without the pressure from the scientists, the Trust would never have attempted to oppose the giant Snowy Mountains Authority, the 'great development' leader in Australia at the time.

A formal submission to the Kosciusko State Park Trust was prepared early in 1958. It was entitled 'Proposed Kosciusko Primitive Area' and was signed by fifty scientists, including thirty-six from CSIRO, eight from universities and six from other govern-ment authorities including the Australian Museum. The majority of these scientists were biologists with at least some ecological interests. The submission was quite explicit. The declaration of a primitive area was a scientific matter: 'the views of scien-tists should be presented on the location and management requirements'.[34] The docu-ment also proclaimed that:

> successful management of the primitive area must be based upon sound ecological prin-ciples. To ensure this the scientists who have given their support to this submission are prepared to co-operate fully with park authorities in future management.[35]

The ecologists here represented the 'radical' view, taking on the biggest development scheme in Australia's history. Conservation in the 1950s *was* ecology, not just for the scientists, but also for the wider community. Organisations such as the Wild Life Preservation Society of Australia in its popular magazine *Australian Wild Life* in 1958 and 1959 strongly endorsed the right of scientists to take a leading role in matters of environmental management.

Although Costin and other activists appreciated the aesthetic values of the high country, these values were not used in the appeal for the preservation of the Kosciuszko Tops. The campaign was for the preservation of sites suitable for scientific

study because of their 'naturalness'. Geological and vegetational sites were foremost in the appeal, not the scenic beauty of the area. In 1950s Australia an 'objective argument' based on science was seen to be the way to apply radical political pressure.

The conservative Australian Academy of Science supported the campaign to preserve the 'primitive' aspects of Australia's highest mountains, though it distanced itself from the strongly worded 1958 proposal, preferring to make separate statements on the subject. The Academy had already published a general report on the High Mountain Catchments of New South Wales and Victoria, edited by John Turner, who was one of its Fellows.[36] This publication was followed by articles in the *Australian Journal of Science*.[37]

The scientists' campaign was successful: the Spencers Creek dam was never built. Their 'victory' was also couched in scientific language: the 'important glaciological sites' around David Moraine and Mt Twynham were spared inundation. The fact that aqueducts are very unsightly was almost certainly the key to the hearts of the campaigners, but this was not mentioned. The parameters of the debate were scientific, ensuring scientific hegemony over the discussion. Perhaps, too, the scientists were aware of their political credibility within the Snowy Mountains Authority itself. The Authority's 'conservation conscious' image, bought at some expense through the funding of the Alpine Ecology Unit would have been seriously tarnished by an open rift with the senior scientific community.

Although it was a grand victory for science and the mountains, the 'primitive area' decision was not advantageous to Costin personally. He was a signatory of the 1958 report, and his Snowy Mountains Authority–sponsored work informed the Turner report. As he put it: 'The SMA [had] plugged in quite a bit of money until that primitive area thing came out and they promptly scrubbed the money [for the Alpine Ecology Unit]'.[38] Costin thought he was going to lose his job but at the last minute CSIRO found the money to continue his appointment. Costin was grateful to stay in Canberra as a major move would have been very difficult for him at that time with six children under five—including triplets and twins. The federal government, by underwriting the Alpine Ecology Unit through CSIRO, also indirectly 'bailed out' the conservation conscious image of the Snowy Mountains Authority. The rift between conservation scientists and the Authority never reached headlines.

Conservation as Applied Ecology

The campaigns of the 1950s established the right of scientists to speak on behalf of nature. The science of ecology emerged throughout the western world in the late 1960s and early 1970s as the 'voice of nature'. But the 'age of ecology' and the ecological movement were part of a wider counterculture, rather than something which emerged directly from the science. Nonetheless, some scientific ecologists welcomed the new popularity and sought to embrace it as a new phase of the 1950s conservation movement. In 1965, the Oxford ecologist H.N. Southern expressed concern about the 'dangerous' increase in population and the corresponding diminution of resources, and sought a 'wise principle of coexistence between man and nature', mediated by scientific

ecologists. Southern argued that this principle was 'conservation' and conservation was 'applied ecology'. The definition of the population/resource problem as 'ecology' translated directly for Southern into a justification of more funds for (scientific) ecological research.[39] The massively well-funded International Biological Program's (IBP) effort in ecology was justified by a similar logic.

The treating of conservation and ecology as synonymous was common throughout the western world. It was particularly strong in Australia because it reflected the fact that scientific ecology had strong continuing links with agencies of natural resource management. The conflation of the terms was often politically convenient for practitioners of both. The CSIRO ecologist Francis Ratcliffe, for example, who was a prime mover in the establishment of the ACF in 1965, firmly believed that conservation was science, and that the science of ecology was central to all conservation decisions. He was puzzled when he sought scientific advice on the question of whether Lake Pedder in Tasmania should be flooded, and discovered that none of the Executive of the Tasmanian Conservation Trust were scientists. He was so convinced of the identity of conservation and science that he sought to keep the ACF at arm's length from the Lake Pedder debate until he could get advice from a reputable scientist on the subject.[40]

Radical ecology brought with it the need to consider cultural and aesthetic arguments, as well as democratic participation in conservation debates. The forestry professionals felt this change most acutely and struggled to justify their place in a debate where all the parameters seemed to change overnight. In Australia, Richard and Val Routley's book of 1974, *The Fight for the Forests*, was the catalyst for admitting values other than scientific and economic to debates about forestry practice. Foresters were appalled by the book which criticised clear-felling on both scientific and aesthetic grounds and questioned the extensive planting of *Pinus radiata* sponsored by the Commonwealth government. The book was very unpopular with the forestry establishment. The Routleys claimed they were subjected to intellectual suppression (through limited library rights) by the Australian National University's School of Forestry.[41] This new 'war' with foresters, seemingly on the 'wrong side', was a source of particular tension for many ecologists. Foresters and ecologists often worked together. Some, like Peter Attiwill, belonged in a sense to both groups. Attiwill trained as a forester and paid back a bond to the Victorian Forests Commission in order to pursue a doctorate in ecology in the United States of America. The perceived oppression of foresters by radical environmentalists has angered and politicised some practising ecologists to take backlash positions.

Other ecologists feel flat, de-politicised and disempowered. The networks of the new environmentalists do not privilege them as senior scientific ecologists in the way the utilitarian conservation networks did. It was not the fact that ecology was being directed towards 'quality of life' concerns that disturbed them. Many of them had always understood it in those broad terms, even if they used scientific jargon to mount their political arguments.

In the late 1980s, the Australian Academy of Science sought to weigh into the debates about the environment through a series of conferences sponsored by the distinguished international virologist Professor Sir Frank Fenner and his wife, Mrs Bobbie Fenner. Fenner is not an ecologist, but his interest in ecological matters dates back to

the 1950s and earlier.[42] He has a direct lineage with the 1950s scientific activists, as he was Secretary, Biological Sciences in the Academy of Science in 1958 when the Kosciuszko Tops debate was at its peak. Fenner's recent involvement has tended to emphasise 'science' as opposed to professional ecology, and suggests another route by which scientists can assert hegemony in environmental discussions. Under the auspices of the Academy, the environment becomes a subject for the generalist scientist rather than the ecologist *per se.*[43]

Some ecologists, too, saw their environmental activism as part of their role as scientist in general, rather than ecologist in particular. They were comfortable with the notion of science as an important cultural activity, and their visions of its role in society were informed by this. Eminent Melbourne ecologist David Ashton, for example, commented:

> I think that the science of ecology is so fundamental that we have to, in our urban environments anyway, take in not only the economics but the sociology, all the interactions in the human level (which) have been mirrored in the animal and plant level. … We need things to support us. We need open spaces. We can't just have a concrete jungle or you get people going nuts … we've got to take cognisance of our human ecology—our relation to our environment, and this is a man-made environment, so we have to think about how we react to it.[44]

Ashton, however, has serious reservations about radical ecology and the green political movement. The shift in the definition of 'experts' and the revised power relations has left him concerned that the decisions are now out of the hands of science, something he regards as undesirable. His views mirror those of his mentor, John Turner, whose own scientific activities were inextricably linked with concerns about the social fabric and education. But Turner was 'too busy' to spend the time attending flat-hierarchy committees which shared power in a 'democratic' way and this led him to join the spate of resignations from the ACF in 1973.[45] Fundamentally, Turner and Ashton assumed that their scientific authority gave them a cultural status that should be trusted. Their difficulties were not with the political and cultural resonances of science, but with a new environmental movement that demanded popular participation in framing the activist agenda.

The science of ecology in Australia has been nurtured in a strongly utilitarian context, and many practising scientists have taken for granted its domination by conservation science professionals. The culture of bureaucracy contrasted sharply with the 'public participation' demanded by the green political movement, and this contrast has contributed significantly to the discomfort of practitioners who saw the media identifying the term 'ecology' with new environmental politics. Australian ecologists have seen profound structural changes in a short time. They were the radical reformers in the 1940s and 1950s and the central experts in control of the government's conservation agenda in the 1960s and 1970s. Many, however, feel only marginality and frustration in the 1980s and 1990s.

The deep suspicion of science and technology that is associated with 'radical ecology' makes rapprochement between 'utilitarian scientists' and 'environmental activists' difficult in the 1990s context. The caricature of the 'greenie' as 'anti-science' does

harm to both parties. One retired forester put it heatedly '[greenies] are just bloody ratbags … but they're the ones the governments are listening to'.[46] The polarised and oppositional relations between greenies and foresters that emerged in the 1980s mask their shared heritage and this is regretted deeply by those with sympathy for both. Since the green revolution, many ecological scientists have felt reduced to mere 'informants', or worse, unconsulted, witnessing rather than shaping and participating in debates. Environmental historians can ensure that the historically deep links between scientific conservation and radical ecology are not forgotten. Identifying a common heritage may lead to a more thoughtful and precise analysis of what aspects of the 'system' are problematic for the Earth.

<div style="text-align:center">N O T E S</div>

1. Statistics from the *Year Book of the Commonwealth of Australia*, 1944–1945 (no. 36), and 1961 (no. 47), pp. 455 and 290, respectively. Australian population growth has continued, though with significantly less jingoism since the 1970s. The 1997 population is about eighteen million.

2. Dingle and O'Hanlon (1996).

3. Collis (1990), pp. 35–38: also McHugh (1989). The 'official' Snowy Mountains Authority history of the scheme is Wigmore (1968). The federal government drove the scheme through against the wishes of the New South Wales government, in particular, but by the late 1950s, it had the blessing of all the States affected by it.

4. Collis (1990), p. 40.

5. Borthwick (1990) related this memory as part of what motivated him to set up Victoria's first Ministry of Conservation in 1973. See also Lake (1987).

6. (F.G. Elford), 'Ped' (1945), p. 351.

7. This phenomenon is well documented for both the United States (Nelkin 1971, 1975, 1977, 1987) and the United Kingdom (Sheail 1987, esp. pp. 224–262).

8. Mitman (1995).

9. Gottlieb (1993), p. 79.

10. For more on the structure of the discipline of ecology in an earlier period, see Robin (1997). There is an established literature about the effects of isolation on Australian science, especially physics. Examples include Home (1984); Jenkin (1985); Chambers (1991).

11. General Source: *The Commonwealth Universities Yearbook, 1993*. Further details were ascertained (in August 1994) by a brief survey of relevant university departments. Only Monash University in Australia has a department of 'ecology' (created by a merger of Botany and Zoology in 1990, and entitled 'Ecology and Evolutionary Biology'). [Professor J. Warren, Chairman of Ecology and Evolutionary Biology, letter to L. Robin, 23 August 1994]. Only two professorial chairs (at other universities) are earmarked 'ecology'. At the University of Sydney there is a Chair of Experimental Ecology established in 1992 as a personal chair for A.J. Underwood, and named by him. [Professor R.G. Hewitt, Dean, Faculty of Science, letter to L. Robin, 28 August 1994]. In the same year, a Chair of Ecology was established at Griffith University in Queensland (occupied by Professor Roger Kitching). [D. Smith, Faculty of Environmental Sciences, letter to I. Robin, 26 August 1994].

12. Specht (1981), esp. p. 410.

13. Cittadino (1980), p. 191.

14. Cited by Bowler (1992), p. 365. Another example was Moore (1920).

15. In the 1950s, State-funded soil conservation agencies and also CSIRO Wildlife Survey branch (later the Division of Wildlife and Ecology) and the Alpine Ecology Unit were all important supporters of ecological research. Departments of agriculture and forestry were also important. While conservation is not the 'primary mission' of CSIRO, the rabbit research of Wildlife Survey and the soil conservation work of the Alpine Ecology Unit were central to those particular branches. In the period since the 1950s, the (state and federally funded) national parks services have also become important employers of ecologists.

16. Osborn (1925); Osborn et al. (1932); Robertson (1986), pp. 116–119.

17. Gillbank (1991, 1993); Robin (1993b), pp. 229–240.

18. This information is based on A.B. Costin's *curriculum vitae*, supplied to Libby Robin at the time of interview (19 April 1994).

19. Gillbank (1991; 1993).

20. Formerly Mt Kosciusko.

21. Breckwoldt (1988), pp. 100–105; Griffiths and Robin (1994), p. 7.

22. Costin (1994), Tape 1, side B.

23. In 1955 he prepared a major report to Victoria's Land Utilization Advisory Council on the detrimental effects of cattle grazing in the Bogong High Plains. (See Gillbank, 1991, pp. 32, 38).

24. Costin (1954): Breckwoldt (1988).

25. Griffiths (1996).

26. One recent critic is Lawrence (1990, 1992, 1994).

27. The term 'Kosciusko School' was used by Williams (1985) in the acknowledgements for his thesis. Many other students have received informal support from Costin and his associates. (Roger Good, personal communication, April 1994).

28. This resulted in a series of papers on the catchment hydrology of the area: Costin et al. (1959, 1960, 1961a, 1961b, 1964).

29. Griffiths and Robin (1994).

30. Harasymiw (1991); Costin (1994); Griffiths and Robin (1994).

31. Wigmore (1968), pp. 61–62.

32. Glaciological work had been undertaken in this area by Edgeworth David and others since the first decade of the twentieth century. (Browne 1914, 1943; Jennings and Costin 1977).

33. Breckwoldt (1988), pp. 95–99.

34. 'Proposed Kosciusko Primitive Area', roneoed typescript, Australian Academy of Science Archives, Canberra [File No. 1002, National Parks Committee], p. 3.

35. Ibid., p. 2.

36. Turner (1957).

37. Australian Academy of Science (1961); Browne et al. (1965).

38. Costin (1994).

39. Southern (1965), pp. 6–7.

40. Robin (1994a).

41. Routley and Plumwood (1986). Val Routley now writes as Val Plumwood. Richard Routley later changed his name to Richard Sylvan.

42. Fenner (1989) comments that his interest in the environment began when he accompanied his father, Charles Fenner, on geomorphological trips in his childhood from 1928 onwards. In the same paper, however, he comments that his concern with the role of science in the management of the environment began in the Academy of Science, and continued through his involvement in the establishment of the Centre for Resource and Environmental Studies (CRES) in Canberra (p. 3). Also discussion with Libby Robin, 21 April 1994.

43. The Fenner conferences have considered the Australian Alps National Parks in 1988 (Good 1989), Protection of Marine and Estuarine Areas in 1991 (Ivanovici et al. 1991), the Conservation of Biological Diversity in Australia in 1992 (Australian Academy of Science 1993) and a Conservation Strategy for the Australian Antarctic in 1993 (Handmer and Wilder 1993).

44. Ashton (1991), p. 23; Also discussion, 10 March 1994.

45. Robin (1994b).

46. Middleton (1990), p. 16.

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The Political Ecology of Deforestation in Honduras

Susan C. Stonich and Billie R. DeWalt

> I can only expect destruction for my family because I am provoking it with my own hands. This is what happens when the peasant doesn't receive help from the government and the banks—he looks for the obvious way out which is to farm the mountain slopes and cut down the mountain vegetation. Otherwise how are we going to survive? We're not in a financial position to say, "Here I am!—I would like a loan to plant so many hectares!" I put in my request but the banks don't want to give me credit because I cannot guarantee to cover the loan. I know what I am doing—as a person I know. I am destroying the land.
>
> —*Honduran peasant, 1990*

Ameliorating global resource abuse will require what we term a *political ecology* of development.[1] Political economic perspectives traditionally have focused on understanding the tension between the government and the market, or on the interaction of the pursuit of wealth and the pursuit of power, as means of organizing human society (e.g., Gilpin 1987:11). In these conceptions the ecological effects of these processes have not been of much concern (Redclift 1984, 1987). In contrast, the political ecology approach looks at how the government and market interact to transform the environment and pursues questions of how political means may be applied to ensure that humans develop symbiotic, rather than destructive, relationships with the natural environment. By assuming that natural environments or ecosystems are in large part social constructs, political ecology also significantly expands much ecological analysis.

This essay uses a political ecology approach to examine the problem of deforestation and other abuses of natural resources in Honduras. The political ecological analysis includes an examination of the interconnections among the dominant export-led development model, the ongoing economic crisis, the policies and actions of

the state, the competition among various classes and interest groups, and the survival strategies of an increasingly impoverished rural population. An examination of the Honduran case indicates that deforestation cannot be understood apart from the associated social processes and suggests that what is happening in Honduras is representative of processes occurring throughout the Central American isthmus. Analysis begins with southern Honduras, one of the most densely populated regions of the country and an area in which natural resources are most threatened.

We will show that

1. Although deforestation in Honduras has many immediate causes, the roots lie in misdirected development strategies that have emphasized export-led growth.
2. Development in the region has in fact exacerbated structural inequalities and extremes of wealth and poverty that have intensified resource abuse throughout the country.
3. Governments (especially the United States in collaboration with the government of Honduras) and bilateral and multilateral aid and lending organizations are exacerbating resource destruction by focusing solely on short-term needs to generate foreign exchange and so-called development, defined only in terms of economic growth.
4. Reversing deforestation and other resource abuse will require an altered development agenda that directly addresses extremes of wealth and poverty and other issues of social and environmental justice.

Development Trends in Honduras

Except for the banana industry established at the turn of the century along the relatively isolated north coast, extensive agrarian capitalism in Honduras did not arise until after World War II during a period of temporarily high prices on the world market for primary commodities like cotton, coffee, and cattle. At that time the industrialized countries promoted capitalist enterprises through increased foreign investment, and national security interests prompted the U.S. government to expand programs of economic and military assistance. The Honduran government became an active agent of development, creating a variety of institutions and agencies to expand government services, modernizing the country's financial system, and undertaking a number of infrastructural projects (Stonich 1993). With the infrastructural improvement, landowners and investors in the southern part of the country found it profitable to expand production for the global market, and southern Honduras was firmly integrated into national and international markets for the first time. Since then diversification and growth of agricultural production for export have characterized the southern Honduran economy. With financial assistance from multilateral and bilateral development and lending institutions (most important: the United States Agency for International Development [USAID], the World Bank, and the International Monetary Fund [IMF]), cotton, then sugar and livestock were the primary commodities first promoted in the south. By the mid-1970s these products were supplemented by

sesame and melons and later by a wider variety of so-called nontraditionals, especially cultivated shrimp (Stonich 1991a, 1992, 1993).[2]

The Honduran government's continued efforts to expand export agriculture are more understandable, given Honduras's extreme economic dependence on agriculture and its continued economic crisis. Honduras remains predominantly an agricultural country; in 1990 agriculture generated about 30% of its gross domestic product, 75% of export earnings, and 55% of employment (Comisión Nacional 1992:67). Indications of the international economic crisis emerged in Honduras in 1981 and intensified through the end of the decade. Productive activity declined drastically, unemployment intensified, and inflation deepened. The balance of payments and the national treasury suffered imbalances, and the real income of a large proportion of the population declined. Honduras was significantly constrained in supplying imported materials, and private investment dropped as a result of the region's political and social problems and disturbances in exchange and monetary systems. This situation was aggravated by the economy's vulnerability to external fluctuations, which affected the demand and price of its most important traditional export products such as bananas and coffee (Stonich 1993).

By 1989 the Honduran external debt of U.S.$3.3 billion was 120% of the annual gross domestic product—larger than the per capita debt of either Brazil or Argentina (Daniels 1990). By late 1989 all the major financial lending institutions (the World Bank, International Monetary Fund, and Inter-American Development Bank) had placed Honduras on the list of countries that were ineligible for new loans because of overdue payments on earlier credits, as well as because of the Liberal government's reluctance to continue its economic adjustment program. Also in 1989, for lack of what it perceived as a sound economic reform program, USAID did not release U.S.$70 million that had been approved to support Honduras's balance of payments.[3]

Economic liberalization was a central component of the platform of the National party, which came to power in early 1990. One of President Rafael Callejas's first actions was to declare the nation bankrupt. Barely a month after taking office Callejas, with the support of his new legislative majority, passed a major reform of the Honduran economy that was both in line with the demands of major creditors and designed to make Honduras more attractive for investors and hence promote exports: the national currency (the lempira) was devalued by 100%, and a crawling peg rate of exchange was adopted; protective import tariffs were slashed from 135% to 20%, and investment regulations—both for foreigners and national entrepreneurs—were simplified.

Fiscal deficit reduction actions included decreased public spending (achieved in part by laying off approximately ten thousand government workers, about 20% of the government's employees, in January 1991), elimination of subsidies, increased water and energy tariffs, and modification of prices to actual market values. The exchange rate of the lempira (per U.S. dollar) rose from 2.0 before the devaluation to 3.5 immediately afterward, to 4.9 by July 1990, and to 5.5 by July 1991. Inflation during the twelve-month period of May 1990 to May 1991 was 38.7%. The ensuing rise in the cost of living further hurt the economic circumstances of the most vulnerable sectors of Honduran society, whose minimum wages remained unchanged and who were also

most affected by the sharp rise in unemployment. Despite the apparent effects of the severe structural adjustment program on the poor and the presidential election of 1993, which returned control to the Liberal party, the ongoing economic crisis makes it highly unlikely that the national government will direct its policies away from attempting to expand export production (Stonich 1993).

In this critical time the natural resource base of the country has come under severe pressure. Honduras is highly dependent upon renewable natural resources to generate income from agriculture, forestry, and fisheries. Natural resource-based commodities were the principal means of earning foreign exchange, providing more than 80% of export earnings throughout the 1980s (World Bank 1984–94). During the fiscal crisis grappling with the repayment of growing external debt has been more important to the Honduran government than conserving natural resources. Raising cotton, cattle, melons, and shrimp draws international financial assistance and helps meet foreign exchange requirements—whatever their social and environmental costs.

The Status of Honduran Forests

During the 1980s Latin America's average annual rate of deforestation was the highest in the world (approximately 1.3% of existing forests were lost annually). This overall rate was exceeded within Central America, which underwent estimated annual losses of 1.6% during the period (World Resources Institute [WRI] 1990:42). During the same period average forest loss in Honduras was appraised at 2.3% annually (WRI 1990:42). Table 27.1 compares the results of an inventory of Honduran forests compiled by the Food and Agriculture Organization of the United Nations in 1964 with a similar inventory completed in 1986 by the parastatal Honduran Forestry Corporation (Corporación Hondureña de Desarrollo Forestal (COHDEFOR) in charge of forest management. It reveals a total loss of forests of 26% (approximately 1.76 million hectares) from 1964 to 1986 and shows that the greatest loss was in broadleaf forests (34.8%) compared to pine forests (12.5%).

In general, rapid rates of deforestation of broadleaf forests first occurred in the southern part of the country in what were primarily tropical dry deciduous forests but more recently have accelerated in the tropical humid forests located in northeasterly portions of the country. The recent *Environmental Profile of Honduras—1989* identifies the principal causes of deforestation (in upland and noncoastal zones) as

TABLE 27.1
Forest Loss in Honduras, 1964–86 (in Thousands of Hectares)

Type of forest	FAO in 1964	COHDEFORE in 1986	Forest loss	Percentage in 22 years	Annual deforestation
Pine forest	2,739	2,397	(342)	12.5%	16
Broadleaf forest	4,072	2,654	(1,418)	34.8%	64
Totals	6,811	5,051	(1,760)	47.3%	80

SOURCE: Corporatión Hondureña de Desarollo Forestal (COHDEFOR 1988), FAO is the Food and Agriculture Organization of the United Nations.

1. Rapid population growth, which led to cultivation of increased marginal land and to an expansion of the agricultural frontier
2. Inefficient and wasteful lumbering practices
3. Lack of supervision and control by COHDEFOR
4. No local incentives for protecting and conserving forests, which translates into indifference on the part of the population
5. Unequal and insecure land tenure
6. No clear national forestry policy
7. Entrepreneurs unaware of the need to manage forest resources in an orderly and sustainable manner
8. Failure by the government to implement a systematic and persuasive education campaign to create public awareness of the necessity to protect and use the forest resources rationally
9. Instability in the group of public administrators that decides forestry policy
10. Lack of an agrarian reform law that takes into account forest management and the rational use of forest resources (Secretaría de Planificación [SECPLAN] and USAID 1989).

There also has been increasing concern about degradation of coastal zones, especially the significant loss of ecologically vital mangrove forests and associated ecosystems in areas surrounding the Gulf of Fonseca (SECPLAN and USAID 1989; Stonich 1991a, 1992, 1993; Foer and Olsen 1992; International Union [IUCN] 1992; Vergne, Hardin, and DeWalt 1993). According to the recent *Environmental Study of the Gulf of Fonseca* (Vergne, Hardin, and DeWalt 1993), the area in high-quality mangrove stands declined by about 6,760 hectares (22%) since 1973. Of this total, approximately 2,132 hectares (32% of the total area lost) was the direct result of the construction of shrimp farms. An undetermined amount of loss can also be indirectly attributed to the expansion of the shrimp industry because road building and pond construction lead to changes in hydrology.

The remaining mangroves are lost to a combination of factors, including the construction of salt-making ponds, the cutting of trees for fuelwood and construction materials, and the gathering of bark from red mangroves for the tanning industry (SECPLAN and USAID 1989; IUCN 1992). For example, approximately 46,300 cubic meters of mangrove fuelwood, equivalent to the loss of 250 to 350 hectares of forest, are used annually (Flores and Reiche 1990). An undetermined but probably significant amount of mangrove destruction can also be attributed to the increased sediment loads carried by freshwater runoff from mountainous watersheds and deposited in coastal zones. Highland deforestation and intensive agriculture on steep hillsides have produced extremely high rates of soil erosion and excessive sedimentation.[4] The destruction of mangrove areas, along with the disappearance of seasonal lagoons, deteriorating water quality, and a declining gulf fishery have precipitated widespread social conflict and placed southern Honduras in the center of increasingly violent confrontations between opposing interest groups (Stonich 1991a, 1993; Vergne, Hardin, and DeWalt 1993; Stonich, Murray, and Rosset 1994).

Government Policy Regarding Forestry Management

In part because of increased concern over the clear-cutting of upland forests by foreign lumber companies, the Honduran government began to assume a greater role in forestry resource management in the early 1970s. The principal laws governing forest management were enacted: Decree 85, the Forest Law, which outlined national forest conservation and management requirements, and Decree 103, which created COHDEFOR as manager of the nation's forests (USAID 1982). The specific mandate of COHDEFOR was to halt clear-cutting by foreign companies and to regulate the extraction and marketing of forest products in order to generate income to finance various government development programs. To accomplish this the Honduran government in effect nationalized the forests.

Although the government was given exclusive ownership of Honduran forests, new or existing groups of farmers living in the forest were considered (at least on paper) the chief means of executing programs to conserve and regenerate the forests. Established within COHDEFOR was the national Social Forestry System (Sistema Social Forestal), the goal of which was to promote the formation of farmer cooperatives or other groups to protect forests by preventing fires, overgrazing, illegal cutting, and the expansion of pasture and shifting agriculture. In addition to supporting cooperatives, COHDEFOR created government-sponsored forest-management zones (areas of integrated management—AMIs) on large forest tracts that were allocated to specific community level groups. The government provided technical advice, materials, and markets, and rural people were to supply the labor. Although by 1987 fifty AMIs had been established, in reality neither the forestry cooperatives nor the AMIs ever received much financial or technical assistance from COHDEFOR (SECPLAN and USAID 1989).

In the wake of passage of laws 85 and 103 a number of serious problems arose, especially regarding enforcement. Among the most crucial were lack of clearly defined forestry policies, regulations, and guidelines, lack of coordination and communication both within COHDEFOR and between COHDEFOR and the many other institutions that affect the management of forestry resources (including several government agencies and ministries as well as organizations of farmers and ranchers), and inadequate execution of plans and decisions. These difficulties resulted in making COHDEFOR a vast, unwieldy, and indecisive bureaucracy and contributed to the uncontrolled and ecologically unsound exploitation of Honduran forests (USAID 1982; SECPLAN and USAID 1989).

SECPLAN and USAID (1989) identified the failures of the national Social Forestry System, as well as the far-reaching powers and inadequate management of COHDEFOR, as among the principal causes of deforestation. In response, the government of Rafael Callejas significantly revised its natural resource policy (Johnston et al. 1990). Preliminary measures included ending COHDEFOR's monopoly on wood exports and doubling stumpage fees in order to discourage overexploitation of forests. Although the government maintained that it was committed to conserving Honduras forests, in 1992 it attempted to enter into a preliminary forty-year contract with the Stone Container Corporation of Chicago to establish a pine plantation and chip mill in La

Mosquitia, the last remaining large area of tropical humid forest in the country (Honduran Popular Action Group 1992). Only widespread public resistance by national and international environmental groups thwarted that effort.

Later the same year, however, Honduras passed the Law for the Modernization and Development of the Agricultural Sector (Decree 31–92), which included controversial forestry provisions (passed in 1993). The law stripped COHDEFOR of all authority except its supervisory and enforcement powers (which remain important) and gave the right to cutting and commercial forest production only to private persons or entities. In addition, companies engaged in various facets of commercial forestry could include foreign owners, partners, and investors and could use foreign capital without limitation (Fandell 1994). Thus shortly after rejecting Stone Container's proposal in response to national and international environmental protests, the government enacted legislation that opened Honduran forests to forestry corporations all over the world. Nor were Stone Container Corporation's efforts to establish a new plantation and mill in Central America blocked. After failing to reach agreement with the Hondurans, the company began negotiations to transfer the operation to the Punta Estrella rain forest in Costa Rica (Scanlan 1994).

Protection and management of mangrove ecosystems received legal status in Honduras through the articles of the Fisheries Law of 1959, which prohibit clearing of mangroves on shorelines, and the Forestry Law of 1958, which declared mangroves protected forestry zones. Although modified by subsequent forestry laws (most important was the creation of COHDEFOR in 1974), the effectiveness of national forestry legislation has suffered from the lack of clear operational directives and shortages of trained staff (Vega 1989). With regard to aquaculture development and mangrove areas, the Honduran government has administrative authority over lands that lie between high tide and a point 2 kilometers inland. Until recently the government exercised this mandate through the Honduran Institute of Tourism, but it has been assumed by the Ministry of Natural Resources. Despite this chance to directly influence the effects of shrimp-farm expansion on mangrove zones, the agency has established no direct link between the granting of concessions for farm construction and requirements for mangrove protection (in part because of the lack of clear procedures governing concessions) (Vergne, Hardin, and DeWalt 1993:22–23).

Southern Honduras: Environment and Demography

Southern Honduras is located in tropical dry and subtropical moist forest zones between the borders of El Salvador and Nicaragua (Holdridge 1962). The zone includes the departments of Choluteca and Valle and has a total surface area of about 5,757 square kilometers, about 5.2% of the national territory. Three major geomorphic areas can be defined within the region: the coastal zone, the plains, and the highland (mountains). The coastal area of the south that lies adjacent to the Gulf of Fonseca provides Honduras with its only access to the Pacific Ocean. This is an area rich in biodiversity—extensive stands of mangroves, seasonal lagoons, estuaries, mud flats, and enclaves of dry tropical forests. The coastal mangrove forests, estuarine waters,

and wetlands generally have a high biological productivity and serve as nursery areas for many species of finfish, shellfish, and crustaceans.

Beyond the mangrove forests lies one of the few extensive plains on the Pacific coast of Central America. The plains can be divided into two zones, an alluvial sedimentary shelf that stretches from the coastal area to 15 meters above the mean high-tide mark and a higher shelf that continues as much as 200 meters above the high-tide mark. This savanna gives way to steep foothills, which quickly become the jagged mountain ranges that form a broad base to the northeast and comprise the majority of the region. Although these volcanic mountains rarely reach altitudes of more than 1,600 meters, they are exceedingly rugged and form myriad isolated valleys.

Remnants of tropical dry forest occur inland from the coastal zone. Such tropical deciduous forests are found in areas where marked seasonality of precipitation predominates and were once prevalent along the entire Pacific coastal plain of Central America. Although deciduous forest once represented the dominant vegetation type in the lowlands of the Pacific coastal region of southern Honduras as well, agriculture (crops and cattle) has almost completely eliminated it. Only a few fragments remain, mostly as scattered gallery forests along streams and rivers.

Pine and oak associations, corresponding to Leslie R. Holdridge's sub-tropical moist forest (1962), occur at altitudes of 600 to 1,800 meters. Predominant species are oak (*Quercus*) and pine (*Pinus oocarpa*) at lower elevations and pine (*Pinus psuedostrobus*) at higher elevations of the zone. Understory varies from grassy cover to low shrubs and tall grasses. Slash-and-burn agriculture, cattle grazing, cutting of trees for fuelwood and construction, and commercial logging of pine for export have greatly modified this habitat.

Islands of cloud (montane rain) forest are found at elevations of 1,350 to 2,300 meters; the almost daily cloud build-up and the lower evaporation rates on mountain peaks provide moisture for the lush plant growth. These highland broadleaf forests generally are surrounded at lower elevations by pine and oak forest. Cloud forests are important in the regulation of surface and groundwater supplies for drinking, irrigation, and hydroelectric power production. Because of their rugged terrain many of these cloud forests remained fairly intact until the 1980s. However, they are being seriously degraded as increasing populations of desperately poor farmers expand slash-and-burn cultivation to these formerly remote areas.

Adding to these environmental concerns has been the considerable climatic instability of the last few decades (Stonich 1993:36). In a region characterized by erratic precipitation the 1980s were marked by the worst drought in fifty years and accompanied by an increase in median ambient temperature of 7.5 degrees centigrade (Almendares et al. 1993). The growing ecological crisis in the region has not only increased the agricultural risk, especially for small farmers, but has also altered the distribution of vector-borne diseases affecting people, crops, and other crucial species. (Comprehensive Resource 1984; Stonich 1986, 1989, 1993; secplan and usaid 1989; and iucn 1992 contain more complete discussions of the environmental context and the natural and agricultural potential of the area.)

Demographic Considerations

The rate of population growth in Honduras has been among the highest in the world, averaging 3.1% per year from 1950 to 1974 and rising to 3.4% from 1974 to 1988 (Stonich 1993:40). In 1990 the population of Honduras was estimated at 5.1 million, nearly double the 1970 population of 2.63 million (World Bank 1992:268). Although the total fertility rate for Honduras dropped from 7.4 births per woman in 1970 to 5.4 in 1989, and the annual growth rate declined to 2.96% by 1990, the country's population continues to grow rapidly, and the population is expected to reach 6.2 million by the year 2000 (SECPLAN 1991:206).

Persistently high rates of population growth have been accompanied by escalating population densities nationally: from 12.2 people per square kilometer in 1950 to 39.1 in 1988 (Stonich 1993:41). Southern Honduras is the most densely settled region of the country, comprising only 5.2% of the total national land area but approximately 9.3% of the population (Stonich 1989:277). Population density remains well above the national average, climbing from 29.8 persons per square kilometer in 1950 to 72 in 1988, with population densities near 150 people per square kilometer in some highland municipalities (Stonich 1993:41).

Although population densities continue to be significantly higher than that of the nation as a whole, since 1950 the rate of growth in the south has not been as high as in other areas of the country. This is primarily the result of extensive out-migration from the region and in part the result an infant mortality rate that is higher than the national average. Almost half of all people born in the region migrate to other parts of the country; the most popular destinations are the capital city of Tegucigalpa, the industrial center of San Pedro Sula, and the rural "agricultural frontier" areas in the northeastern part of the country. Considerable migration from rural to urban areas of the south (the cities of Choluteca and San Lorenzo) also is occurring. Despite migration to urban centers within the region, the south remains more rural than the country as a whole, with three-quarters of the population living in rural areas in contrast to 60% nationally (Stonich 1991b, 1993).

Agrarian Transformation and Ecological Consequences

The Cotton Boom

It was cotton cultivation that first transformed traditional social patterns of production in southern Honduras (Stares 1972:35; Durham 1979:119; Boyer 1982:91). Although cotton had been grown in the area since preconquest times, large-scale commercial cultivation of cotton was introduced in the late 1940s and 1950s by Salvadorans who brought seeds, chemicals, machinery, and their own labor force into the area. Salvadoran farmers secured Honduran bank loans, rented (or purchased) large tracts of land from Honduran owners, and began commercial production. They were joined by Honduran farmers who first began producing on a minor scale but who by 1960 expanded production and formed their own ginning and marketing cooperative. When the Salvadorans were expelled from the country after the Salvadoran-Honduran War

in 1969, their property was confiscated and became available to the Honduran growers (Stonich 1986:118).

As in El Salvador and Nicaragua commercial cotton cultivation in Honduras involved considerable mechanization in land preparation, planting, cultivation, and aerial spraying and was dependent on the heavy use of chemicals (especially insecticides and fertilizers).

The indiscriminate use of pesticides in the cotton-growing regions remains among the most pervasive environmental contamination and human health problems throughout Central America (Central American Institute [ICAITI] 1977; Weir and Shapiro 1981; Bull 1982; Botrell 1983; Boardman 1986; Williams 1986; Leonard 1987). Water from cotton-growing areas of southern Honduras shows heavy contamination from DDT, dieldrin, toxaphene, and parathion (USAID 1982). A 1981 study of the levels of pesticide poisoning in the area around the city of Choluteca, Honduras, revealed that approximately 10% of the inhabitants had pesticide levels sufficiently high to be considered cases of intoxification (Leonard 1987:149). A number of reports show that the land and water contamination from pesticides, as well as high levels of pesticide residues in food supplies, continue to have substantial effects on human health (Williams 1986; Leonard 1987; Murray 1991).

The major social effect of the cotton boom was to increase inequalities in access to land. Large landowners revoked peasant tenancy or sharecropping rights and raised rental rates exorbitantly so that peasants would leave the land. Landowners also laid claim to many wilderness areas and forcibly evicted peasants from national land or from land of undetermined tenure (Parsons 1975; Durham 1979; Boyer 1982:94). Increased cotton cultivation thus displaced many poor farmers from the more suitable agricultural lands in the south. At the same time, however, cotton provided many seasonal jobs during the harvest season, because the long-staple cotton grown in the region was largely picked by hand.

Production of cotton in the south fluctuated considerably before the cotton boom finally ended in the late 1980s. The build-up of pesticide-resistant insect populations and the increasingly high costs of pesticides, combined with low market prices, effectively ended cotton cultivation in southern Honduras. Although attempting to resurrect cotton cultivation using integrated pest management techniques has been discussed, virtually no cotton was planted in the south through 1992.

The Cattle Boom

The expansion of the cattle industry probably had the most extensive and devastating environmental effects in the south. During the 1960s the Alliance for Progress and the growing demand for inexpensive beef by the expanding U.S. fast-food industry helped to fuel a livestock boom throughout Central America.

Honduras increased its export quotas to the United States, implemented development initiatives that stimulated the beef trade and modernized beef production, and instituted credit programs to help expand beef production. From 1960 to 1983 57% of all loans allotted by the World Bank for agriculture and rural development in Central America financed the expansion of beef for export. During that same time Honduras

received 51% of all World Bank funds disbursed in Central America, of which 34% was used for livestock projects (Stonich 1992). This assistance was funneled into the country through institutions and projects controlled by national elites as well as foreign (especially U.S.) interests (Stonich and DeWalt 1989).

In a context of declining agricultural commodity prices, high labor costs, unreliable rainfall, and international and national support for livestock, landowners reallocated their land from cotton and/or grain cultivation to pasture for cattle (Stonich 1986; Stonich and DeWalt 1989). Cattle appealed to landowners in Honduras because cattle can be husbanded with little labor. With only two or three hired hands and extensive pasture a landowner can manage a herd of several hundred cattle. Ironically, land reform programs also encouraged the expansion of pasture for livestock. Landowners who feared expropriation of unused fallow and forest land fenced it and planted pasture to establish use of the land without substantially increasing their labor costs (Jarvis 1986:157; Stonich 1986, 1992).

Large landowners also exploit the growing inequalities in access to land with an inexpensive way to convert land from forest to pasture: by renting hillside land in forest to land-poor peasants (DeWalt 1983, 1985, 1986). These renters cut the forest down in order to plant maize and sorghum, their principal subsistence crops. During the second or third year of cultivation, when land fertility declined, landowners instructed the renters to sow pasture grasses among the maize and/or sorghum. This converted the land, usually permanently, into pasture for cattle. Renters recognize that they are destroying their potential source of livelihood as more fallow and forest land is converted into pasture. They are caught because they have to meet their short-term needs for survival, yet they jeopardize their long-term future by participating in the pasture conversion process. In the words of one small farmer, "Right now we have land available to rent, but each year you can see the forest disappearing. In a few years, it will all be pasture and there will be no land available to rent. How are we to produce for our families then? We see what is happening, but we have no choice because our families have to eat now."

The expansion of pasture caused extensive changes in land-use patterns in Honduras through the 1960s and 1970s. Growth took place in the lowlands and foothills, where cattle raising traditionally occurred, and in the highlands, where many of the wealthier peasant farmers augmented cattle production with income generated by agricultural production (Durham 1979; Boyer 1982; Stonich 1986). Increased livestock production in the lowlands and the highlands accelerated the expulsion of peasants from national and private lands (White 1977:126–156; Stonich 1986:139–143). From 1952 to 1974, for example, pasture in the southern region of the country increased from 41.9% of the land to 61.1% and was associated with the simultaneous and precipitous decline of land in fallow and in forest (Stonich 1989, 1993). Thus both deforestation and serious soil erosion accompanied the cattle boom. It has been estimated that Honduras is losing its forests at the rate of 10,000 hectares per year and, if current trends continue, "the forest resource will be exhausted in a generation" (USAID 1990:3). Most dry tropical forest in the south has already disappeared, and soil erosion rates are alarming.

Local and Regional Consequences of Development

The social consequences of the expansion of the cotton and cattle industries—of economic development—on rural areas of the south have been discussed in detail elsewhere (see White 1977; Durham 1979; Boyer 1982; Stonich 1986, 1989, 1993; Stonich and DeWalt 1989). Briefly, development led to ever greater socioeconomic inequalities of households in the region. Farmers with medium and large holdings sought to improve their competitive position in the world marketplace. Using the international foreign assistance that was channeled through government loans, they tried to cut their costs by investing in commodities and techniques that were labor displacing rather than labor absorbing; they tried to achieve economies of scale by acquiring more land and expanding their operations; and as material costs rose and prices fell for cotton, they increasingly switched their operations to cattle, a commodity that requires small amounts of labor and large amounts of land (DeWalt 1986; Stonich and DeWalt 1989).

The appropriation of land for commercial agriculture and for extensive livestock raising relegated resource-poor individuals to the most marginal areas of the south. Using shifting cultivation systems, peasants in the foothills and highland regions expanded production to steep slopes, interplanting maize and sorghum (their primary subsistence crops) for a few years before leaving the field in fallow to regain its fertility (Stonich 1993). The conversion of land to pasture, combined with the rapid growth of the human population, has increased the pressure on the remaining cropland. During the last several decades fallowing periods in the south have decreased. In some communities fallow periods have been eliminated entirely, whereas in others the fallowing interval has decreased, from fifteen to twenty years in the 1950s to just a few years (Stonich 1993:150–152). This trend toward permanent cultivation has led to depletion of the soil and has exacerbated the soil erosion problems on steep slopes (Stonich 1993:150–152). Thus the landscape of southern Honduras has been transformed in recent decades. The greatly disturbed regional ecology has been left vulnerable to the volatile weather patterns since the mid-1980s and has resulted in extensive flooding, landslides, and watershed destruction.

The concentration of agricultural land, combined with the lack of alternative economic options and growing environmental destruction, led many resource-poor families to seek opportunities elsewhere (Stonich 1991b). Between 1974 and the late 1980s out-migration from the southern region averaged 1.3% annually. Approximately half as many people left the region permanently each year as were added to the population by both its high birthrate and limited in-migration. Many poor families engaged in cyclical or permanent migration to the cities or came to depend on remittances from family members (Stonich 1991b). The urban population growth rate in Honduras was about 5.6% from 1974 to 1987, a rate much higher than the overall national population growth rate of about 3.4% for the same period (USAID 1989b). The expanding squatter settlements on the edges of Tegucigalpa and San Pedro Sula bear witness to the environmental problems caused by this rural to urban migration.

Migrants from environmentally degraded areas in the south also have extended the agricultural frontier by settling in the departments of Olancho and El Paraiso, which

border the relatively unpopulated tropical humid forest region of La Mosquitia in northeastern Honduras. According to the national population census of 1974, the adjacent departments of El Paraiso and Olancho rank behind only the largest cities (Tegucigalpa and San Pedro Sula) as the predominant extraregional destinations of migrants from the south (Stonich 1991b). Community-level research shows that by the 1980s these two departments accounted for more than 50% of the total destinations of male householders from rural highland communities in the south (Stonich 1991b).

The first organized migration of people from the south to La Mosquitia began in the early 1970s, and by the 1980s communities had settled along the entire upper reaches of the Rio Patuca. The colonization of this area of tropical humid forest has extended into the Rio Platano Biosphere Reserve. Replicating processes taking place throughout Latin America, deforestation has taken a heavy toll on ecosystems, as newly arriving colonizers (many using the illegal roads constructed by loggers) clear forest for crops, cattle, and fuelwood, thereby facilitating the expansion of ranching interests and encroaching on the lands inhabited by Honduras's small remaining indigenous population.

Another strategy for resource-poor households is to relocate within the southern region to the relatively sparsely populated coastal region of mangrove, mud flats, estuaries, and seasonal lagoons along the Gulf of Fonseca. Unsuitable for large-scale cultivation of crops, pasture, or most other commercial uses, this area has become populated by increasing numbers of migrants from other municipalities in the south. From 1974 to 1988, a period of substantial out-migration from the southern region as a whole, rural populations in the six municipalities that border the Gulf of Fonseca grew faster than the country as a whole. The families settling the coastal communities survive by exploiting the resources of the coast and the estuaries. They clear the wilderness to cultivate crops but have come to depend as well on fish, shrimp, shellfish, animals, and wood gathered from the surrounding common resource areas—lagoons, mangroves, estuaries, and the Gulf of Fonseca. Until the early 1980s the only major competition for these coastal resources was from commercial salt-making operations.

Since the end of World War II the landscape of Honduras has been transformed through deforestation, overgrazing, changes in agricultural systems, and other environmental stresses. Along with other seriously degraded areas of the world such as Haiti, the Philippines, southeastern Kenya, and Nepal's middle mountains, it has been designated a critically endangered region where basic life-sustaining systems, including water and soils, are threatened (Kasperson, Kasperson, and Turner in press). Environmental decline within the country has been most severe in the southern zone, where semidesertification and growing rural impoverishment have spurred extensive migration to other areas within and outside the zone.

The paradox is that environmental degradation is most serious in an area that has been an important target for a series of economic development initiatives. The political ecology of development in Honduras reveals the interconnections of the dominant development strategy, deforestation (and other forms of environmental destruction), and worsening rural poverty. As part of an overall strategy of export-led growth, a series of nontraditional agricultural commodities has been championed in southern

Honduras since the 1950s. This prevailing development strategy has altered the agrarian structure of the region, exacerbated existing social and economic inequities, and shaped the ways in which natural resources have been exploited.

By fostering economic growth at the expense of human populations and the environment, this strategy has encouraged environmental degradation as well as political instability and violence.

An analysis of the growth of the shrimp industry in Honduras is particularly useful in showing how the latest development trend has advanced the social and ecological processes established with the cotton and cattle booms, spatially as well as temporally, to coastal zones now having greatly enhanced economic value. Diminished access to common property resources, brought about by government-sponsored privatization efforts and encouraged by international agencies, is not a new occurrence in southern Honduras. Nor are enclosure movements, supported by force, that result in rural displacement, repression, and violence.

A political ecological perspective allows analysis of deforestation and other forms of environmental decline and human poverty to go beyond overly simplistic explanations that ascribe blame to particular commodities (e.g., the "hamburger connection"). According to measures of land scarcity, displacement, poverty, and environmental degradation, outcomes have been similar regardless of which commodities have been promoted. Although the specific commodities being promoted vary, the underlying social and economic relations remain the same.

The repetition of these processes through time and through space demonstrates the extent to which these dynamics are part of the structure of Honduran society and tied to the dominant development model.

Political ecological analysis also moves beyond a fixation on population growth as the only, or the most important, factor in explaining environmental degradation. The political ecological approach demonstrates that blaming the population increase for environmental degradation in the region is too facile and diverts attention from the complexity of issues facing the region and from a more comprehensive explanation.

Although the rapid increase in population growth in the region is a matter for serious concern, population growth per se cannot adequately explain the destructive land-use patterns that have emerged. Although population growth may be a part of the explanation for some environmental problems, the nature of agricultural development in the region is more responsible for most problems. Development in the region has been highly uneven, not only in terms of the distribution of economic costs and benefits but also in terms of its effects on the spatial distribution of people. Political economic factors related to the expansion of export-oriented agriculture constrain access to the most fertile lands of the region. This results in a highly unevenly distributed population in which the greatest population densities occur in the highlands—the areas most marginal for agriculture. The growing population in the highlands has few opportunities to earn a living and continues to distribute a diminishing amount of land among more and more people while intensifying agricultural production and expanding into areas more marginal for agriculture. Growing rural poverty also stimulates out-migration from the more densely packed south, thereby decreasing population pressure in highland areas and simultaneously augmenting urban populations

and escalating pressure on heretofore undamaged coastal zones in the south and tropical humid forests in other parts of the country.

Within the south, in urban centers throughout Honduras, and in frontier areas being settled, the mounting evidence of ecological and human decline may portend long-term and immutable threats to human, economic, and environmental sustainability. Moreover the government appears to be rushing into the new privatization scheme for its agricultural land and forests without ensuring that it has the capacity to enforce new regulations and ameliorate social and environmental consequences. Deforestation and other grave environmental abuses in Honduras will not improve unless the basic social structural inequalities in the region are confronted and alleviated.

Deforestation will continue so long as people do not have enough land, jobs, and food. Environmental catastrophe will likely ensue unless the predominant development agenda is transformed to remedy expanding social inequalities as well as environmental ills.

NOTES

1. Elsewhere, Susan Stonich (1989, 1993) has critiqued the dominant paradigms used to explain environmental degradation (including deforestation) in tropical areas of the developing world: neo-Malthusian, neoclassical economic/technological, and dependency. The argument is that although several of these major paradigms identify one or more factors relevant to a comprehensive explanation of social and environmental change, no single model adequately explains poverty and environmental deterioration in areas of the developing world such as southern Honduras. As an alternative, the overall approach here is a more comprehensive framework that integrates political, economic, and human ecological analysis. The political economic analysis examines the interacting roles that social institutions (international, national, regional, and local) play in providing constraints and possibilities that affect human decisions that in turn affect those institutions as well as the natural environment. Human ecological analysis allows the consideration of demographic trends, environmental concerns, and issues related to human health and nutrition. It expands the perspective of political economy to include an examination of the distribution and use of resources and the dynamic contradictions between society and natural resources. A more comprehensive discussion of political ecology appears in Stonich 1993, chapter 1.

2. Melons grown on irrigated land have also been an important nontraditional export promoted in southern Honduras in recent years. For discussions of the social, economic, and environmental effects of the melon industry see Murray 1991 and Stonich et al. 1994.

3. These funds were released to the new Honduran government that took office in January 1990. In July 1991 the Honduran Central Bank reached an agreement with the IMF that paved the way for an influx of American capital—$1.8 billion worth of external finance over a three-year period: U.S.$300 million in 1991, U.S.$70 million in 1992, and U.S.$750 million in 1993 (Honduras/International Monetary Fund [Honduras/IMF] 1991a:5). In August 1991 Honduras requested from Mexico and Venezuela the rescheduling of its U.S.$51.2 million bilateral debt and a new loan of U.S.$120 million (Honduras/IMF 1991b:6).

4. Erosion is estimated to occur at rates as great as 13 tons per hectare per year in the upper Choluteca watershed, and about 168 cubic meters of soil per second are transported in the river at the bridge on the outskirts of the city of Choluteca (Vega 1989).

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Peasants and Global Environmentalism

Akhil Gupta

"South" versus "North"

In contrast to the humanistic pronouncements of "sharing one world," made mostly by leaders and activists from the North, is the view of representatives of poor countries that the environment is a crucial arena where conflict between the haves and have-nots manifests itself. This is a perspective that is likely to increase in importance in the future. As Gus Speth, president of the World Resources Institute, put it after Rio, the United States "has totally missed the point that the axis of world affairs has shifted from East-West to North-South" (*Newsweek*, June 22, 1992, 46). Maurice Strong, the UNCED secretary general, emphasized the same point when he said, "If we fail at Rio, it will be one of the greatest breakdowns ever in international relations, especially concerning North and South" (*India Today*, June 15, 1992, 71).

The general outlines of the argument made by the South are the following: Most of the pollution in the world (CFC emissions, carbon dioxide emissions, toxic wastes, pollution of oceans) and the overwhelming proportion of resource depletion have been caused by rich countries in the North in the process of industrialization. For this use of common resources, the North did not pay anything. Now that poor countries in the South are industrializing, the North wants to put up barriers on the grounds that the commons cannot be allowed to deteriorate any further. As *Newsweek* pithily put it, "This is the global application of the well-known phenomenon that one's willingness to make 'sacrifices' for the environment goes up in proportion to the number of Volvos one already owns" (June 1, 1992, 22). The South wants to get equal access to the commons. Or, put another way, it wants compensation from the North for having used up common resources so that it can industrialize without using the same polluting, wasteful technologies employed by the North in its industrialization. However, the countries of the North are not willing to make such transfers, and because they control the few instruments of international governance that exist, they usually have their way.[1] I will illustrate this viewpoint by analyzing in greater detail some specific issues that came up at the Earth Summit.

The first point of contention at the Earth Summit had to do with its agenda.[2] Thus, greenhouse gases, biodiversity, and the preservation of forests were discussed on the grounds that they constituted global issues requiring global negotiations and treaties, whereas issues such as desertification, soil erosion, drinking water availability, and sanitation were ignored on the grounds that they were "local" issues best left for sovereign nations to deal with (Centre for Science and Environment [CSE] 1992:2; *India Today*, June 15, 1992, 90).[3] Environmental concerns were discussed in isolation from the economic processes in which they were embedded. So, for example, matters relating to protectionism practiced by northern countries or an end to tariff discrimination against goods manufactured in the South were avoided. Dawood Ghaznavi, head of the Worldwide Fund for Nature in Pakistan, said "GATT is crucial to saving the environment. The fact that trade was largely left out of the financing discussions is the most regrettable thing that happened at UNCED" (in Schwarz 1992:61). A major trade-related issue that has very significant implications for the environment is Third World debt. Indeed, it has been argued that the North could achieve more by debt forgiveness than any explicit policy aimed at ecological degradation and resource conservation. Although they have been much admired as creative solutions to tropical deforestation, debt-for-nature swaps end up supporting the current global debt regime rather than seeking to dismantle it. "Only desperately-indebted countries have their debt sufficiently discounted on the world's secondary debt market so that it can be purchased in debt-for-nature swaps. Debt stress, and the implicit threat of terminating the flow of loans and bridging funds, is typically in the background as environmental organizations and development agencies have worked to prompt developing countries to strengthen their environmental conservation policies" (Buttel 1992:20). Environmental organizations and development agencies thus rely on the presence of debt stress to provide leverage for their own interventions.[4]

Perhaps one way of understanding the divergence between North and South at the Earth Summit is to see that of the two themes that the conference was trying to bring together, environment and development, the North focused on the former while ignoring the latter, whereas the South focused on the interrelationship between the two.[5] Third World environmentalists point out that environmental problems in the North arise from different sources than do those in the South (Shanmugaratnam 1989). In rich countries, the chief problems have to do with the control of pollution and the disposal of wastes. In poor countries, by contrast, the chief problems arise from the overexploitation of the natural resource base (CSE 1992:1).[6] This overexploitation is not due to "population pressures" or "poor management," as northern experts would have it, but to economic linkages in which the raw materials from the South serve as essential inputs into goods manufactured, and largely consumed, in the North. Anil Agarwal, for example, points out that "despite the worldwide process of decolonisation, there is today many times more land being used in the developing world to meet the food needs of the Western countries than in the 1940s" (1985:5). In a World Bank paper, Piritta Sorsa acknowledges that "as a transmitter of many externalities, trade may contribute indirectly to environmental damage" (1992:3). He goes on to argue that only 1 percent of yearly destruction of tropical timber can be attributed to international trade, the rest being the result of "land clearance for agriculture, and

the poor's use of wood for fuel" (3). He neglects to ask if the clearing of forestlands or cutting of wood may be related to the use of the best agricultural land to grow crops for export or the use of wood in industrial products also employed for the same purpose. The counterfactual question should be, If the First World's consumption per capita were the same as that of the twenty most densely populated Third World countries, how much destruction of forests would there be?

The potentially more "open" agricultural trade regime that will result from GATT certainly does not bode well for the future of sustainable agriculture in the Third World. Those regions that use mechanisms to force prices of agricultural goods to reflect externalities such as nonrenewability or pollution would find their markets flooded with cheaper commodities from regions that do not adopt such measures (Harold and Runge 1993). The speed with which sustainability is exported to the rich countries of the North is likely to be accelerated, as highly indebted Third World countries set up efforts to increase agricultural exports to the West to meet their interest payments. Because increases in output with methods of industrial agriculture also involve increased outlays for petroleum-dependent inputs such as chemical fertilizers, the balance of payments consequences of agriculture-led export growth are unlikely to be highly favorable for poor countries and may even turn out to be only one bad harvest away from being negative (see also Buttel 1993). On the other hand, sustainable agriculture, presumably conducted with organic inputs, would have the effect of reducing expensive petrochemical inputs and hence reducing foreign debts for poor nation-states, but they would, as a result, make debt-for-nature swaps less attractive for banks, donors, and environmental organizations. It would thus undercut one of the key programs mounted by First World environmental organizations to promote sustainable growth.[7]

Transnational trade is one of the most effective ways to transmit the ecological costs of overconsumption on to others. One way to theorize the transfer of materials processed at enormous environmental costs in the South to the North through "free" trade is to see that such transfers represent a subsidy to northern consumers. A report by the Centre for Science and Environment (1992:2–3) makes this point very clearly: "Developing countries export sustainability while industrialized countries import it at the cost of the former. This discounts the future of the South and passes on the immediate costs of environmental degradation onto the world's poor living on the margins of their environment."[8] This transfer is exacerbated when the terms of trade turn against the raw materials that poor countries export to the North. And this is precisely what happened throughout the 1980s.[9] If the current effort to institute Trade-Related Intellectual Property rights is successful, it will further disadvantage many poor peasants in the Third World vis-à-vis powerful transnational corporations. Farmers, who now save, modify, and sell seeds of high-yielding varieties to one another will be prevented from doing so by the new arrangements. A sense of the importance of farmer-to-farmer transfer of seeds can be gauged from the fact that only approximately 38 percent of the seed requirement of Indian agriculture is sold by formal agencies.[10] Henceforth, this will be the exclusive right of the companies that hold the Plant-Breeders Rights to the seed in question (New York Times, May 16, 1989). Patent rights (Intellectual Property Rights) thus become a code to protect the "rights" of

multinationals to corner the surplus from the sale of seed varieties. Anyone who has the resources to alter seeds genetically and then, very important, has the ability to patent such an "invention" obtains the monopoly to market such seeds (Khoshoo 1993; *Economist*, May 30, 1992, 64; June 13, 1992, 93–94).[11] It is for this reason that the leader of the Karnataka farmers announced that their "one-point program" was to "drive out the multinationals" (Sahai 1993a, b; Shiva 1993).

The argument about the South's export of sustainability finds support in the fact that northern countries are willing to promote global environmentalism as long as it doesn't affect their consumption practices. The data here is compelling: "The haves form just 23 per cent of the population, occupy 50 per cent of the land area, account for 60 per cent of the energy consumed and earn 85 per cent of the world's income. … an average American consumes over two tonnes of steel every five years in the form of cars and eats 112 kg of meat, whether beef, lamb or pork, every year. And consumes 7,822 kg of oil equivalent annually. In contrast, an average Indian consumes 50 kg of steel in the form of a cycle and eats only 2 kg of meat annually. And consumes barely 231 kg of oil in the form of energy" (*India Today*, June 15, 1992, 96).[12] If, as a thought experiment, one were to multiply India's per capita consumption figures by four to compensate for its larger population, consumers in the United States would still end up using ten times as much steel and oil as Indians. This is entirely consistent with other studies of consumption (Bidwai 1992:853). That Western styles of consumption were not sustainable was evident a long time ago. In 1908, Gandhi asked, "If it took Britain the exploitation of half the globe to be what it is today, how many globes would India need?" (cited in CSE 1992:4). Southern leaders at Rio insisted that the real issue was overconsumption by the North; predictably, there was almost no acknowledgment of this fact except in Gro Harlem Brundtland's opening statement, in which she said, "We can't tell the Third World, 'The waste-basket is full because we filled it, now you have to help us empty it'" (*Facts on File*, June 18, 1992, 442).[13]

These positions were prominently displayed in the debates over the global warming treaty, which called on all industrial nations to return to their 1990 levels of emissions of hothouse gases. Developing countries would be permitted a ten-year grace period before restrictions were imposed on them. The twelve nations of the EC had made an earlier pledge to reduce their emissions to 1990 levels by the year 2000, and they repeated that pledge at the summit. Germany, which is responsible for 3.2 percent of global carbon emissions, unilaterally agreed to cut them by 25 percent by the year 2005. In the face of stiff U.S. opposition, however, the treaty was signed without specific deadlines. Together, the United States and the former Soviet Union account for over half the carbon dioxide emissions in the world, and as a group, the North is responsible for 90 percent of the carbon dioxide that has accumulated in the earth's atmosphere so far (*New York Times*, May 2, 1989; Tokar 1989; Bidwai 1992:854). Yet a plan to impose a carbon tax in industrialized nations was foiled owing to heavy lobbying by oil-producing countries.

Given the inbuilt inequalities in the treaty that favored industrial countries, the U.S. reluctance to sign was surprising.[14] Praful Bidwai offers the following example: "If U.S. per capita annual emissions (5.2 tons) were to be frozen and India's (0.22 tons) were to grow at recent rates, India would not reach one ton a year until 2024—a

level surpassed by the United States well before 1900" (1992:854). Although industrial countries are required under the treaty to assist developing nations financially and technologically to control their emissions of greenhouse gases, the financial commitments do not approach the true cost of atmospheric exhaustion. "If Northern emissions could be traded with the South at $15 per ton of carbon equivalent and damages were to be paid at $25 per ton, the top fifteen polluters would have to pay $110 billion to the South; the United States alone would have to pay $45 billion a year" (Bidwai 1992:854). When the UNCED secretariat pressed the industrialized countries to contribute $125 billion toward resolving *all* major environmental problems faced by the South (an effort that they estimate will cost $625 billion annually), they met with little success. Members of the EC and other industrial countries agreed to increase their aid levels to 0.7 percent of their GNP "as soon as possible" (but with no date specified). The United States refused to agree to the aid target that it, along with other industrial nations, had pledged to meet during the Stockholm Conference in 1972!

Many people in the First World, policymakers and environmentalists alike, held up the Montreal Protocol on Substances That Deplete the Ozone Layer (1987) as an example to be emulated in the design of international environmental treaties (Babbitt 1992:36; French 1992:12–14; *Economist*, June 13, 1992, 39). The Montreal Protocol had delayed deadlines for developing countries, a provision to transfer resources, and punitive trade measures for nonimplementation. The view from the South, however, saw the ozone layer treaty as a disastrous pact that would permanently institutionalize global inequalities. Bidwai offers this opinion: "Since no responsibility is attached to different countries for their varying contributions to the CFC burden, no rights and obligations follow. So the South, with its current emission of 12 percent of CFCs, is asked to make the same commitment, albeit over a longer period of time, as the North, which produces 88 percent of the total. The underlying assumption is that it would be a disaster if every Chinese or Indian (not American or Japanese) had a refrigerator, but that it is not necessary for the rest of the world to find substitutes for CFCs" (1992:854). What has gone unnoticed about the ozone layer agreement is that it was enthusiastically supported by the handful of multinational corporations who produce CFCs. The reason is that they are also the only companies that manufacture CFC substitutes, and "a world ban on CFCs was obviously an ideal way to lock up the largest possible market for substitutes" (Cairncross 1992:18). Countries in the North were also far more concerned about the consequences of the depletion of the ozone layer, as it had immediate effects on the health of their populations.

The struggles between North and South were sharpest, however, over the proposed forest convention, which was scaled back to a nonbinding statement of forest conservation principles in the teeth of stiff opposition from such countries as Malaysia, India, and Indonesia (*Far Eastern Economic Review*, June 25, 1992, 62; *Facts on File*, June 18, 1992, 442; Lakshman 1992). Northern countries, led by the United States, were very keen to push through a forest convention. Tropical forests in particular are excellent "sinks" that absorb carbon dioxide and thereby minimize or reverse global warming. They are also the sites where most of the world's genetic diversity is preserved.[15] The northern countries thus felt that they would benefit on two different fronts with one policy. Countries such as Malaysia and India argued that forests were a sovereign

resource.[16] Malaysian prime minister Mahathir bin Mohamed said that a forest convention made sense only after a worthwhile agreement on industrial emissions was reached. Like other developing countries, Malaysia felt that the United States had no justification for pushing for a forest convention while failing to agree to a timetable for halting global warming.[17] Mahathir bin Mohamed argued that timber sales were crucial to the economic development of his country. Once again, the deteriorating terms of trade of primary goods entered the picture in a central way. The Malaysian prime minister suggested that instead of poor countries' having to shoulder the responsibility to provide carbon sinks for the entire world, an aggressive worldwide program of *re*forestation be conducted in which northern countries would be responsible for shutting down their inefficient farms and their polluting industries and foresting the land on which they stood.[18]

So far, I have attempted to draw a contrast between "one world" versions of global environmentalism and "North-South conflict" views of the same phenomenon. Both these perspectives underplay the significant differences between states, environmental groups, and subaltern groups within the North and the South, suggesting a degree of homogeneity that does not in fact exist. In the next section, I argue that despite their sharply opposed viewpoints, "one world" and "North versus South" positions share a modernist discursive space shaped by common ideas about territoriality, sovereignty, and the nation-state.[19] What are the commitments entailed by such a view? Does this perspective obscure emergent processes of global regulation and control? Specifically, are there *postcolonial* forms of global discipline and global regulation that are elided by emphasis on national sovereignty? It is to these questions that I now turn.

Rethinking Environmentalism: Governmentality on a World Scale

Global environmental problems have brought about an interesting convergence between otherwise radically distinct political and theoretical positions. People who hold different perspectives on environmental issues all agree that they somehow bring into question the premise of national sovereignty on which the existing order of nation-states is based (Wallerstein 1991b:140; Young 1982, 1989).[20] What continues to differentiate people along lines of "one world" or "North-South conflict" is their understanding of exactly how national sovereignty has become problematic, what is to be done to deal with this new situation, and how one goes about theorizing the emerging world context (Walker and Mendlovitz 1990b:1). In this section I argue that one way to understand global environmental accords is to see them as part of a larger process that is weakening the intimate links between "nation" and "state." I see this as a fundamentally "postcolonial" moment in that it initiates a break with a spatial order of sovereign nation-states that was forged in the anvil of colonialism and fired in the furnace of national liberation.

Typical of nongovernmental North views is the one expressed by French.

National sovereignty—the power of a country to control events within its territory—has lost much of its meaning in today's world, where borders are routinely breached by

pollution, international trade, financial flows, and refugees. Increasingly, they may be eroded by such forces as climatic warming, migrations, and the depletion of the earth's ozone shield. Because all of these forces can affect environmental trends, international treaties and institutions are proving ever more critical to addressing ecological threats. Nations are in effect ceding portions of their sovereignty to the international community, and beginning to create a new system of international environmental governance as a means of solving otherwise-unmanageable problems. (1992:6)

Similarly, in the wake of the pessimism expressed by many at the failure of the Earth Summit to approve binding treaties, there were those who pointed out that the real gains of Rio should not be overlooked. One of the benefits of the Earth Summit was that "for the first time in history, nations vowed to take into account global environmental concerns when making *internal* economic decisions" (*Newsweek*, June 22, 1992, 46). Jessica Tuchman Mathews, vice president of the World Resources Institute, is quoted as saying, "[The global warming treaty] has the potential of forcing governments to change domestic policies to a greater degree than any international agreement I can think of" (*Newsweek*, June 15, 1992, 33). Maurice Strong brought together the ideology of markets with concerns about security in speaking of a "new global compact in which the industrialized nations understand that they cannot secure their future without a partnership with developing nations" (*Far Eastern Economic Review*, June 25, 1992, 61).

The view from the South also recognizes that discourses of environmental degradation pose a distinctive new kind of threat to national sovereignty because of their stress on northern control of remedial measures.[21] In southern interpretations, the emphasis has so far been either on northern dominance, sometimes glossed as "ecological imperialism," or on the necessity of seeking broader coalitions. In the former case, national sovereignty is at peril because control over national resources (forests, and flora and fauna embodying biological diversity) is threatened by powerful northern countries in the name of preserving the "world's heritage" (Chengappa 1992). This is clearly the view expressed by Malaysia's Mahathir bin Mohamed.[22] In the latter case, national sovereignty is rendered ambivalent because the only way to defend it is to merge one's own national interests with some other nation's. Traditional enemies, China and India, banded together, and the Group of 77 united in the face of strenuous northern attempts to split them up (*India Today*, June 15, 1992, 70).

Another way to see the growing recognition of the crisis of sovereignty is to look at opinions about the role of *international* organizations in dealing with environmental issues (Keohane and Ostrom 1995). The present system of international governance, organized largely in the immediate aftermath of the Second World War, is considered to be ill-equipped to deal with global environmental questions. Whereas the Brundtland Commission identifies the narrow mandates of existing institutions as the source of their inability to deal with global environmental problems, others believe that a more radical overhaul of the *system* of international institutions is necessary.[23] There is thus a recognition that environmental issues are raising questions about national sovereignty and *international* governance, about national order and the order of nations. But to understand precisely what this challenge means theoretically, I will first briefly trace the historical relations between sovereignty, territoriality, and the nation-state.

However odd it may appear from the perspective of the present, the notion that systems of rule should be, or need be, territorial is not at all self-evident.[24] It is a peculiarity of the particular history of modern Europe that a system of rule came to be institutionalized that had at its basis states that were *territorial*; that were, moreover, territorially *fixed*; and that entailed the *mutual exclusion* of others from the territory (Agnew and Corbridge 1995:79). In medieval Europe or precolonial India, for example, territorial exclusion was not an operative principle of political power.[25] "The distinctive feature of the modern—homonomous—variant of structuring territorial space is the familiar world of *territorially disjoint, mutually exclusive, functionally similar*, sovereign states" (Ruggie 1993:151, emphasis added).[26] A strong centralized administrative state is not found in Europe until the end of the fifteenth century (Foucault 1991:103), and it is another two centuries before a *system* of states comes into effect (Young 1988:29). Charles Tilly called the sixteenth century "a time of significantly rising stateness" and characterized the later seventeenth century as constituting "a frenzy of state-making" (1975a:34).[27] In other words, a long period of conflict over the *nature* of political units was followed by conflict over the *boundaries* of those units (Ruggie 1993; Tilly 1975a:28). Yet by the beginning of the eighteenth century, the practice of the mutual acknowledgment of sovereignty that it termed the "state system" was already in place.[28] That this was a highly contingent outcome was underlined by Tilly when he wrote: "The Europe of 1500 included some five hundred more or less independent political units, the Europe of 1900 about twenty-five. The German state did not exist in 1500, or even 1800. Comparing the histories of France, Germany, Spain, Belgium, and England (or, for that matter, any other set of West European countries) for illumination on the processes of state-making weights the whole inquiry toward a certain kind of outcome which was, in fact, quite rare" (1975a:15).[29] State sovereignty, which is today often elided with national sovereignty, actually emerges in a period historically prior to the consolidation of the nation (Wallerstein 1991b:143). That this curiously hyphenated entity, the nation-state, does not evoke constant surprise is a testimony to its complete ideological hegemony. Scholarly work has tended to underestimate seriously the importance of that hyphen, which simultaneously erases and naturalizes what is surely an incidental coupling (Kaviraj 1994; Nandy 1992). Tilly emphasized this when he said, "In Europe … [nation building] generally occurred after the formation of strong states, and by no means as a direct or automatic consequence of state-building alone." He summarized the contributions to a volume on state building in Europe by emphasizing that the authors "insist on the analytic separation of state-building from nation-building, and consider *the nation-state only one of several possible outcomes of state-building*" (1975a: 70–71; emphasis added).

Scholars of nationalism ask what holds such an imagined community together; what the mechanisms are that produce and reproduce the structure of feeling that is termed "nationalism"; what its exclusions and silences are; how it emerges; and where it is likely to lead. Scholars of states inquire into the circumstances that led to the centralized system of administrative rule that is called the state system; what conditions ensure its reproduction; the situations in which states are transformed, come into existence, die, or fall; what enables them to get things done, to defend their borders, and to secure their existence. When the concept of *national sovereignty* came to be

conjoined to the territorial basis of statehood, then the ideology of the modern order of nation-states, as it exists today, was firmly established (Ruggie 1993: 163; Walker and Mendlovitz 1990a:6).[30] Just as states need the interstate system to establish territorially based authority, so do nations need the international system to engender, regulate, and normalize the feelings that are dubbed "nationalism." In fact, neither statehood nor nationalism is possible or intelligible without the interstate and international systems.[31] What has to be understood about the nation-state is that it fuses these powerful forces in one entity. Not enough attention has been paid in the scholarly literature so far to the implications of this fusion, both for the study of nationalism and "the state" and, equally importantly, for the study of internationalism and the interstate system.[32]

Once the problem is laid out in this manner, it becomes clearer why the idea of sovereignty is so paradoxical. The claim of sovereignty is one that attempts to stabilize and fix territorial boundaries, specify identities, and establish unambiguous control over goods and people (Onuf 1991; Shapiro 1991: 448, 473; Walker 1993:161).[33] But insofar as the sovereignty of nation-states depends on the recognition of *other* nation-states, of other units that are different in their culture, history, and even "temperament" but alike in their constitutive modality, then the pretense to self-sufficiency is revealed for what it is (Malkki 1994). In other words, sovereignty is a *relation* that, to be exercised, must "misrecognize" itself as a self-sufficient identity. Starting from the premise of state sovereignty, therefore, already structures the analysis of "interdependence" or "world politics" in such a manner that alternative forms of alliance, community, spatialization, or identity are suppressed or erased (Agnew and Corbridge 1995; Shapiro 1994; Walker 1993; Walker and Mendlovitz 1990b).

The paradoxical nature of sovereignty as absolute individuation first became visible with problems of diplomacy. The question was how to recognize the sovereignty of some other state *within* your own territory through the person of the ambassador and the ambassador's staff and their offices and residences. The solution was to carve out a particular space (the embassy) that was recognized as "extraterritorial" in that the laws of some other nation-state operated on that particular territory.[34] Not just diplomats and common property resources challenge the ideology of sovereignty: flows of all kinds across the borders of territorial nation-states, most notably trade but also images, finances, and people, call the construction of stable identities into question.[35] Ruggie suggests the notion of the "unbundling" of territory as a way to come to grips with the means employed by nation-states to "attenuate the paradox of absolute individuation" (1993:165).[36]

Another way to theorize this growing phenomenon of the "unbundling" of territory is to think about its consequences for the hyphen between nation and state (Appadurai 1993). What I would like to suggest is that there is a growing tension between nation and state so that the particular enclosure that was conjured by their historically fortuitous conjunction may slowly be falling apart. The clearing does not hold in the hyperspace of late capitalism. The kinds of activities and meanings that were ideally brought together by nation-states—the regulation of industries, goods, and people; the control and surveillance of populations; the exercise of the monopoly on violence within the territory; the provision of "security" with respect to other nation-states

(Dalby 1992); the employment of laws; the feeling of belonging to "a people"; the belief in particular historical narratives of identity and difference—may be untangling (Comaroff forthcoming).[37] It is very likely that they will reconstitute themselves into different bundles. But it is highly *unlikely* that the reconstituted entities will simply be reproductions of nation-states, writ large or small. As Étienne Balibar has said of the European Community, "The state today in Europe is *neither national nor supranational*, and this ambiguity does not slacken but only grows deeper over time" (1991:16).[38]

This focus on the "unbundling" of territorially based sovereign nation-states may help us see that much of the discussion on whether nation-states are declining or increasing in importance may be missing the point. For one can often point to persuasive evidence that leads to *both* conclusions for the *same* cases. Rather than be cursed like the equivocator "that could swear in both the scales against either scale,"[39] I wish to argue that the "postcolonial" be employed to signify that the hyphen between nation and state be written "under erasure." Arjun Appadurai uses the term "postnational," arguing that it has three possible implications: that other forms of allegiance and identity are replacing the nation-state; that alternative forms of organizing the flow of resources, images, and ideas are contesting the nation-state or constituting peaceful alternatives to it; and that national identities are taking hold that have no foothold or basis in territorial states (1993:421).[40] To suggest that the particular historical conjuncture that brought "nation" and "state" together into a stable form of spatial organization may be coming to an end is not to argue that forms of "nation-ness" or forms of "state-ness" are in danger of disappearing altogether.[41] New, more menacing, racially exclusionary forms of national identity are emerging in Europe and the United States, for example, and statelike functions are being performed by organizations such as the European Union and transnational corporations. One way to understand the enthusiasm with which "big" government has been attacked in the North is to see that the Fordist project of regulating the national market through government intervention is no longer viable. Fordist mass production proved to be an unusually efficient engine of growth, particularly in the United States since the Second World War (Aglietta 1979; Brenner and Glick 1991; Davis 1984). However, late-capitalist forms of capital accumulation have been straining against the fetters of a national market, and so the national state now appears to be an overbearing presence.[42] National states are by no means obsolete, but their statelike functions are being increasingly "privatized" except insofar as they represent direct subsidies to transnational corporations. What is one to make of this retreat of "state-ness" in the very heart of the capitalist West? And how is the selective rollback of the functions of the state to be related to the virulence of an exclusionary, racially charged nationalism? Are these twin movements connected in any way to postcoloniality? What I wish to suggest is that if postcoloniality is the condition that registers the exhaustion of the promise of the modern nation in the former colonies, its other face is the superannuation of the Fordist nation in "the West." The two movements, one toward poststate forms of capitalist organization in "the West" and the other toward postcoloniality in the Third World, come to be linked at this historical juncture by new modalities of global discipline and regulation.[43]

Instead of the decline of the nation-state, I prefer to talk about the tension between "nation" and "state," arguing that a particular relationship that coalesced in the formation of nation-states may be unraveling. Of course, in many parts of the world, particularly those whose borders were arbitrarily drawn by departing colonial rulers, that relationship between nation and state was never a convincing fiction.[44] Another way to theorize the growing crisis of the hyphen is to shift our attention to a process that Foucault (1991) has termed "governmentality." By government rationality or governmentality, Foucault refers to that ensemble of institutions, procedures, and tactics that allow the exercise of a certain kind of power whose object is population in the sense that it seeks to regulate the relations between people and things (Gordon 1991). In Europe, the problem of government expanded in the sixteenth century in the face of opposing tendencies to state centralization and religious dissidence. Thus, the government of the self, the government of souls and lives, the government of children, the government of the family, and the government of the state by the prince all become important questions in that period: "how to govern oneself, how to be governed, how to govern others, by whom the people will accept being governed, how to become the best possible governor" (Foucault 1991:87). The model of government was provided by economy, the art of managing a household wisely for the common welfare of its members. The problem was to extend this model of the household to the government of the state, to exercise over people and things within a particular territory the kind of surveillance and control that the head of the family exercised over his patrimony—his family and his goods. This became possible only with the rise of statistics (with its etymological root as "the science of the state"), which provided the technology to envision the "economy" and "the population" as concrete and palpable realities through tabular representation. By the middle of the eighteenth century, the craft of governing well thus became the art of managing the economy and the population for the common welfare of all.[45] The sole purpose of rule was no longer just the defense and expansion of the sovereign's wealth and territory; rather, it became the provision of security more generally.[46] This technique of governmentality was instituted both inside and outside the state. It was a "very specific albeit complex form of power, which has as its target population, as its principal form of knowledge political economy, and as its essential means apparatuses of security" (Foucault 1991:102), a form of rule that Foucault suggests continues to operate in the present.

What I am suggesting in this chapter is that we may be witnessing the birth of a new regime of discipline in which governmentality is unhitched from the nation-state to be instituted anew on a global scale.[47] In this project, global environmentalism comes together with other global accords and treaties, and the institutions through which these "compacts" are monitored and enforced, to regulate the relationship between people and things on a global (not simply international) scale. The Earth Summit, GATT, and other international treaties are attempting to institutionalize a new form of governance, this time not within the territorially defined boundaries of the nation-state but across an "unbundled" space for which there is not as yet a name, a brave new world order (Gill 1991).[48] These shifts in forms of governance are integrally related to the reorganization of capitalism in the last quarter of this century (Mandel 1975; Harvey 1989). Just as the nation-state was integral to Fordist manufacture by

multinational corporations, which had the backing of powerful imperialist states, so is the tension between nation and state related to the industrial dominance of *transnational* corporations in post-Fordist capitalism, which are themselves ambivalently positioned in regards to their nationality. But these new models of governmentality are not going unchallenged by groups that are likely to be adversely affected by them. I turn now to an analysis of the actions of peasant groups in India that have organized a series of successful protests against global treaties.

Peasant Protests

No one can predict how emerging modes of governmentality will affect the everyday lives and practices of peasants in different parts of the world. Vigorous reactions to the GATT were recorded during the year preceding its formal signing on April 15, 1994, however. In this section I analyze peasant protests in India, reflecting on the interpretations implicit in their actions.

The farmers' rally had its origin in another act, the daring "raid" of December 29, 1992, in which members of the Karnataka Farmers Association ransacked the Bangalore corporate offices of Cargill Seeds India Private Limited, an Indian subsidiary of the giant U.S. grain-trading multinational. Seventy-five farmers climbed the four flights of stairs to the Cargill office, burst through the door, announced that they did not intend to harm the dozen or so employees but were there as a protest. The farmers then proceeded to smash windows, break open filing cabinets, and throw papers and financial records through the window to the crowd of four hundred waiting below. Once the stack of papers grew tall, Nanjundaswamy handed over a box of matches to a farmer who lit the flame, bringing all traffic on the road to a halt. "Bon fire," Nanjundaswamy proclaimed, adding, by way of explanation: "From the French origin. Good fire." The farmers gathered in a ring around the fire and shouted "Quit India" in Kannada (Tolan 1994:18).

This action drew a formal protest from the U.S. government and is credited with "opening the Dunkel debate to the public" (*Frontline*, January 14, 1994, 42). Professor Nanjundaswamy, the leader of the Karnataka Farmers, was unrepentant. Using the same logic displayed by Union Carbide in rejecting responsibility for the actions of its Indian subsidiary in the Bhopal disaster but inverting its ends, Nanjundaswamy claimed that because Cargill India is registered under the Indian Companies Act, "what happened at Bangalore was between Indian farmers and an Indian company. There is no room for diplomatic interfering. America's interference exposes their ulterior motives. The Indian government should not [have] tolerated this, let alone apologized." He went on to add that he had received congratulatory telegrams from all over the country after the attack (*Times of India*, January 11, 1993). This raid was followed by another attack on the Cargill factory in Bellary. In protest against the patents taken out on the biopesticide qualities of the neem seed, the Karnataka Farmers threatened to destroy the factory owned by the Indian partners of the American multinational W. R. Grace Company (*Deccan Herald*, November 23, 1993). Eventually, they did not go ahead with their plan because of the presence of a hydrogen plant next to the targeted factory.

In Nanjundaswamy's discourse, the Farmers Association was carrying on a struggle against colonialism that had first been launched by the nationalist movement. He proclaimed the farmers' intentions as being "to banish all multinational seed companies which are here to ransack our country." He explicitly referred to the farmers' actions as initiating the "second Quit India Movement against imperialists" and reiterated their commitment to Gandhian socialism, "which has been forgotten by all political parties" (*Times of India*, January 11, 1993). Very similar themes were voiced by other leaders at a giant rally of half a million farmers that took place in Bangalore on October 3, 1993. Mahendra Singh Tikait, the leader of the primarily north Indian farmers organization, the BKU, warned those present to be prepared for a second round in the freedom struggle. He compared the multinational seed and pesticide firms with the East India Company, which had looted the country of its wealth. "We should not permit the recurrence of such an act. The country is still to attain prosperity" (*Hindu*, October 4, 1993, 11). Similarly, Sesha Reddy, one of the most prominent of the Karnataka activists, said: "We call Cargill the West India Company. We don't want a West India Company to once again dominate our economy, our freedom, our politics. We are prepared to die for this." Graffiti on city walls declared, "Reject Dunkel, Reject Imperialism" (Tolan 1994). Tikait, even more than Nanjundaswamy, reproduced a nationalist discourse in which prosperity and modernity constitute the telos of national liberation. Both leaders used development discourses, premised on teleologies of the nation, that had been hegemonic internationally until the eighties to organize against the contemporary paradigm of "open" economies touted by the international aid system.

The nationalist rhetoric of such peasant leaders as Tikait and Nanjundaswamy might appear to be anachronistic in 1993, especially given the disappointments faced by the large majority of rural Indians in almost half a century of independence. But the peasant leaders' rhetoric is mixed with a shrewd recognition of the current global historical conjuncture and of the importance of forging coalitions with similar groups in other parts of the world. Like those movements of indigenous peoples that have formed, on the basis of an indigenous identity, transnational coalitions that are simultaneously above and below the nation-state, peasant leaders worked actively to make connections with other groups across the world. Thus, of the resolutions adopted at the meeting, one proclaimed that "plant wealth, seed wealth, and intellectual property were the property of the *farmers of the world* and called upon all countries to launch a direct struggle to protect the collective rights [of farmers] and prevent them from being robbed by multinational companies" (*Hindu*, October 4, 1993, 11; emphasis added). An international research center to develop intellectual property rights on behalf of farmers was initiated and a pledge made to continue the free exchange of seeds among farmers of the Third World. The international institute for sustainable agriculture was formally inaugurated on May 30, 1995, as a joint project of the KRRS and the Third World Network, a development and environmental organization based in Malaysia.[49] Apart from the promotion of organic farming techniques, the aims of the institute include helping farmers store traditional varieties of cultivars in community seed banks and revitalization of those cultivars to preserve genetic diversity. Farmers brought two hundred varieties of various crops with them to start the institute's seed

banks. Explaining the need for the institute, Nanjundaswamy said that farmers had been incurring mounting debts because of input-intensive modes of cultivation, that they had become dependent on a few varieties of cultivars promoted by large seed companies, and that the soil had been made infertile by large doses of chemical fertilizers. Therefore, it was necessary to turn to productive, sustainable, organic farming (Khor 1995).[50]

Nanjundaswamy featured prominently in an anti-Dunkel protest meeting of farmers, ecologists, and consumer groups from around the world in Geneva on December 4, 1993, while the final GATT negotiations were taking place. Contrary to positions attributed to him earlier, he maintained, "Our stand is that India should remain a member of GATT, but should have demanded drastic amendments in the agreement" (*Frontline*, January 14, 1994, 42). In what follows, I will briefly pursue the interesting contradictions between the explicit emphasis on national sovereignty and self-determination and the populist appeal to "farmers of the world" and to other transnational, intermestic (*inter*national/do*mestic*) coalitions that put sovereignty into question.[51]

These tensions were harder to find in the statements of various peasants at the March rally, which, in conscious reference to the Independence Movement, was called the "seed protest" (*beej satyagraha*).[52] As one farmer put it, "We are aware that these foreign proposals are an attempt to deny the best seeds to us and put us at a disadvantage when compared to farmers of richer nations. If they are accepted, the multinational companies will start determining *our domestic* agriculture policies. We are also protesting against other anti-farmer steps taken by the government in the past" (*Times of India*, March 4, 1993; emphasis added). In virtually the same sentence, this farmer articulated both the kind of nationalist position historically espoused by the government in India and a critique of the same government for emphasizing the industrial, as opposed to the agricultural, sector in its pursuit of modernity and self-reliance. Deewan Chand, a small farmer from Muzaffarnagar, UP, voiced a more unambiguous nationalist position: "Our leaders have said that the foreign paper [Dunkel Draft] is an evil design to sell Mother India to foreigners. For a *kisan* [farmer] the life support are his land, seed and plough. If the Rao Government sells these to foreigners what will happen to the national pride?" (*Hindustan Times*, March 4, 1993, 5). Another farmer, from the prime minister's electoral constituency, expressed incomprehension at the changing objectives of the government. Assuming that the long-held nationalist goal of self-reliance was a worthwhile one, Sesha Reddy pointed to the crisis of food production that had plagued the country in the second half of the sixties: "But not today. We are now self-sufficient in crop production. So why this sell-out to MNCs [multinational corporations]?" (*Hindustan Times*, March 4, 1993, 5).

It would be misleading to portray the massive protests *against* the Dunkel proposals as if all peasants were unanimously behind them. A newspaper editorialized that "those opposed to the Dunkel proposals are the nation's traditional farmers, predominantly small and medium peasants, whereas those who support Dunkel are from those areas where farming is advanced and has assumed the characteristics of a profit-making business" (*Navbharat Times*, March 4, 1993; my translation). Despite its indubitable political appeal, such a dichotomy is not defensible. The great majority of the supporters of the vociferously anti-Dunkel BKU were relatively well-to-do landowning

farmers, with large marketed surpluses, who belong to the prosperous agricultural castes that have been the chief beneficiaries of the government's green revolution policies. Their demands and agitations largely reflect this orientation, calling for loan write-offs, increasing the subsidy for fertilizer, the nonpayment of electric dues, increasing support prices, and so forth.

An analogous class of farmers forms the backbone of the Maharashtra-based Shetkari Sangathana (Farmers Union), which supported the Dunkel Draft. Sharad Joshi, the leader and chief ideologist of the Shetkari Sangathana, declared: "What's wrong with Dunkel? I prefer to pay royalty for good quality seeds than pick up bad subsidised ones" (*India Today*, North American edition, January 15, 1994, 19). The pro-Dunkel group also held a farmers rally in New Delhi on March 31, 1993. Explaining the significance of the demonstration, Joshi stated: "We fully support the Dunkel proposals and a totally free economy. We shall seek an alliance with other forces which stand for a free economy. This will be a producers versus parasites demonstration" (*Hindustan Times*, February 17, 1993). Joshi pronounced the end of the first republic in which the state controlled the economy, and he issued a call for the second republic, with no government control on exports, imports, or the rest of the economy (*Hindustan Times*, February 17, 1993).[53] This was in keeping with his belief that if government restrictions on them were lifted, farmers in India could profitably sell on the world market without subsidies. The organizations present at the meeting presented a five-point charter of demands to the government that included calls for stopping the dumping of agricultural produce from abroad on the Indian market (*Times of India*, April 1, 1993).

The Shetkari Sangathana's position underlines the fact that the class implications of the new modes of governmentality are far from transparent. There are splits even within the politically powerful class of relatively well-to-do farmers with marketable surpluses, and the forces allied against international treaties regulating biodiversity yield no simple mapping in terms of class positions, geographical contiguities, or crop regimes.[54] If the argument advanced in this chapter is correct, the "unbundled" space in which these forms of governance are exercised creates its own possibilities for opposition to coalesce. Just as international and interstate regimes of control and discipline were instituted through the nation-state, the new forms of governmentality operate through this postcolonial space created out of the chasm where the hyphen once stood between "nation" and "state." And just as older modes of resistance coalesced around the politics of the nation-state, employing the rhetoric of nationalism and development, so too will new modes of resistance find their tactics in this "unbundled" space of global discipline (see Walker and Mendlovitz 1990a:10).

NOTES

1. Speaking about the Rio declaration, *Newsweek* says "the declaration evolved into a lengthy charter spelling out the 'rights' of poor countries to develop in responsible ways. This, of course, is one of the things Darman warned Bush about: it's ecospeak for 'foreign aid'" (June 1, 1992, 22).

2. See especially Shiva 1992.

3. A World Health Organization (WHO) report on global environmental damage points out that safe drinking water and sanitation would have prevented a large proportion of the 3.2 million child deaths that occurred last year from diarrheal disease alone (*Newsweek*, June 1, 1992, 33).

4. Buttel (1992:20) goes on to say, "Some (e.g., Martinez-Alier), in fact, have devoted considerable attention to the fact that the 'North Atlantic ecological establishment' coexists so comfortably within the structural adjustment *Weltanschauung* of the official development community, which exists as much to ensure Third World debt repayment and to patch up the anarchic international monetary order as it does to achieve Third World development."

5. The relationship between particular strategies of development and the environment has been demonstrated in the case of the green revolution.

6. It was precisely the overexploitation of land and water resources that worried farmers in Alipur.

7. It is not just sustainability that is being exported from the Third World. The *New York Times*, in a report entitled "3d-World Funds: Wrong-Way Flow," says "the world's poorest and most indebted countries are beginning to get less in combined aid each year from the World Bank and the International Monetary Fund than they are paying in interest and principal … to the two organizations" (February 11, 1988).

8. See also Kothari and Kothari 1993.

9. "In 1985, the terms of trade of sub-Saharan countries (except oil-exporting countries) were 10 percent below 1970 levels" (Brundtland 1987:3–5). The same process was observed in Latin America: "In 1981, for instance, it took one Latin American country 9.8 times as much beef to buy a barrel of oil as it did in 1961" (A. Agarwal 1985:5). An estimate of the amount of money transferred from economies in the South to the North through debt payments and deteriorating raw materials prices (but not including the costs of consuming common environmental goods) is offered by Martin Khor of the Third World Network. He estimates the value of annual transfers from South to North to be in the range of $200 billion (Hertsgaard 1992:13).

10. In other words, more than 60 percent of the seed used by farmers is obtained from other farmers (Sahai 1993a).

11. The market for seeds in India has been estimated to be worth $235 million for 600,000 tons a year (*Times of India*, December 13, 1993).

12. See also Bandyopadhyay and Shiva 1988.

13. As the CSE statement puts it, "The billion dollar question is: are the rich prepared to pay the real costs of what they consume?" (CSE 1992:3).

14. The reason was the fear that reduction of carbon emissions would entail economic costs. As one U.S. negotiator at UNCED put it, "The United States' standard of living is not up for negotiation" (Hertsgaard 1992:13).

15. Tropical forests, which cover barely 7 percent of the world's land surface, harbor half the species of the world's flora and fauna. A fifteen-acre patch of rain forest in Brunei alone was found to have seven hundred species of trees, as many as in *all* North America (*India Today*, June 15, 1992, 82–84).

16. India's environment minister Kamal Nath argued: "How we deal with our forests is our business. This so-called globalising sinks idea stinks" (*India Today*, June 15, 1992, 87).

17. As Malaysian minister for primary industries Lim Keng Yaik put it: "The U.S. is saying: you lock up your carbon sink, and I am going to do nothing. [It] wants poor countries to sacrifice [revenues from selling wood] in order to maintain the consuming lifestyle of the rich" (*Far Eastern Economic Review*, June 25, 1992, 62). Representatives of the South point to the poor

record of the North in conserving its forests: "Since Europeans first arrived in the New World, all but 5 percent of the virgin forests have been cut down" (*Newsweek*, June 1, 1992, 30).

18. The other side of this picture is provided by José Lutzenberger, former Brazilian minister for environment, who says "the Malaysian minister of the environment is reputedly also one of the worst loggers in that country" (1992:56). In spite of the justifiable criticisms that the Malaysian prime minister makes here, I should not be taken to endorse his record of protecting Malaysia's rain forests, which is reportedly abysmal. However much Mahathir's positions made sense as an advocate for the South, they were interpreted by the inhabitants of Malaysia's rain forests as yet another aggressive move by the national state against their existence.

19. In the section titled "Peasant Protests" below, I consider the implications of changes in this modernist space for differentiation among peasant groups in the South, as well as for the formation of transnational coalitions between groups in the North and the South.

20. See, for example, Keck, who argues, "Such conflicts may raise issues that go well beyond a narrow vision of environmental problems, in questioning states' abilities to know and preside over the public good" (1994:91). Similarly, Walker and Mendlovitz (1990a:1) contend that "in view of … a new awareness of the fragility of the planetary ecology, the organization of political life within a fragmented system of states appears to be increasingly inconsistent with emerging realities" (see also Agnew and Corbridge 1995:95). Contrarily, Krasner argues that the existing order was never a real condition for most Third World states. Despite this, he adds that the Westphalian state has become a reference point or convention that is "useful in some circumstances but not others" (1995:150). I think it is fair to say that the *premise* of national sovereignty has constituted a founding ideology for the global order of nation-states in which most Third World nation-states came into existence.

21. This led the *Economist* to complain, in an article entitled "Root of Evil at Rio": "After all the idealism, the Earth summit in Rio de Janeiro has turned out to be mainly about money and sovereignty" (June 13, 1992, 12).

22. The reporting in the South reflected this sense of defiance to northern domination. For example, an *India Today* report states, "The only time the South showed some grit and India leadership was when the North tried to push for a convention on saving forests. … [T]he South stood firm on the issue as they feared that such a convention would infringe on national sovereignty" (June 30, 1992, 31). Similarly, the *Far Eastern Economic Review* noted: "Malaysia's staunch refusal to bow to US pressure for a stronger statement on deforestation prompted one US delegate to describe the country as the 'bad boy' of the conference. 'So be it,' Razali [Malaysia's ambassador to the UN] says. 'Someone has to carry the can. We don't want to be *pushed aside and be bullied* like we have been for the past 45 years'" (June 25, 1992, 61; emphasis added).

23. French, for example, argues that "international laws and institutions have traditionally functioned as compacts between nations; but if they are to solve the problems of a rapidly deteriorating biosphere, they must also evolve into compacts *between people*" (1992:48; emphasis added).

24. The ideas in this paragraph owe a great deal to Ruggie 1993.

25. See Walker 1993:129 on the relationship between post-Renaissance ideas of state sovereignty and notions of sharply demarcated space.

26. Krasner (1995) identifies the distinctive features of the Westphalian state as being territoriality and autonomy.

27. Tilly traced the emergence of the familiar state system by contrasting it with possibilities that might have been: "In the thirteenth century, then, five outcomes may still have been open: (1) the form of national state which actually emerged; (2) a political federation or empire

controlled, if only loosely, from a single center; (3) a theocratic federation—a common-wealth—held together by the structure of the Catholic Church; (4) an intensive trading net-work without large-scale, central political organization; (5) the persistence of the 'feudal' structure which prevailed in the thirteenth century." He went on to argue: "The structure which became dominant in Europe after 1500, the national [*sic*] state, differed from these alter-native possibilities in several significant ways: (1) it controlled a well-defined, continuous terri-tory; (2) it was relatively centralized; (3) it was differentiated from other organizations; (4) it reinforced its claims through a tendency to acquire a monopoly over the concentrated means of physical coercion within its territory" (1975a:26–27). In a later work, Tilly admits that it was a mistake to characterize such states as "national" and that it might have been better to have called them "consolidated" states (1994:5).

28. Tilly's periodization was as follows: "The main rhythm, then, has three beats; (1) the formation and consolidation of the first great national states in commercial and military com-petition with each other, accompanied by their economic penetration of the remainder of Europe and of important parts of the world outside of Europe roughly 1500 to 1700; (2) the re-grouping of the remainder of Europe into a system of states, accompanied by the extension of European political control into most of the non-European world, save those portions already dominated by substantial political organizations (e.g., China and Japan): roughly 1650 to 1850; (3) the extension of the state system to the rest of the world, both through the acquisition of formal independence by colonies and clients, and through the incorporation of existing powers like China and Japan into the system: roughly 1800 to 1950. … Europeans played the major part in creating the contemporary international state-system, and presumably left the imprints of their peculiar political institutions on it" (1975b:637–38).

29. This shrinkage in the number of states was not restricted to Europe. When India be-came an independent nation-state in 1947, it was by the merger of more than four hundred in-dependent princely states.

30. I am clearly referring here to what became the dominant conception of the order of nation-states.

31. The argument for the national/international connection has been developed at some length in Malkki 1994.

32. Of these twinned concepts, nationalism/internationalism and state/interstate, it is inter-nationalism that has received the least attention. In fact, scholars of nationalism have so far paid more attention to ethnic or subnational identities than to transnational or international ones (Malkki 1994 is an exception; see also Gupta 1992). Given this fact, there is still a lot of ground to be covered before the emergence of studies that treat the interstate and international systems as being constitutive, rather than external, aspects of the nation-state (but see Waller-stein 1991a:139–57, 184–99).

33. Manzo points out that "reasoning man" has been the ultimate site of sovereignty in lib-eral thought, and the extension of sovereignty to other agencies like the state, the community, or the people has taken place either by extending the reach of "reasoning man" (for example, via the social contract to the state) or by drawing an analogy between the institution and the individual. It is for this reason that "a discussion of 'sovereign states' in anything other than individualist terms is so notoriously difficult" (1991:7).

34. The particular people who were representatives of that other sovereign republic (who enjoyed "diplomatic immunity") were also subject to the laws of their own nation-states. The notion of "diplomatic immunity," with its medical metaphor of an infectable body, is itself worth closer analysis. I owe this example to Ruggie (1993).

35. See in particular Xenos 1996 for a discussion of refugees and the nation-state. Krasner

(1995:117) goes further in suggesting that every major peace treaty has compromised the West-phalian model of territorial sovereignty.

36. The ethical questions raised in and by "the contemporary, unstable post-sovereign con-dition" are explored in Shapiro 1994.

37. I fully agree with Krasner (1995) that very few nation-states, particularly in the Third World, actually managed to accomplish all these tasks. I would argue, however, that these ideals are becoming problematic even for those powerful states which had come closest to the model of the Westphalian state.

38. Agnew and Corbridge state a very similar position when they write that "globalization and fragmentation do not signal their terminal decline; the Final Fall of the territorial state. But at the same time … the world that is in the process of emergence cannot be adequately understood in terms of the fixed territorial spaces of mainstream international relations theory (and international political economy)" (1995:99). In a similar vein, the argument about whether states will obstinately remain or become obsolete is criticized by Walker because these binary positions "share the same spatial imagery, an imagery rooted especially in seventeenth- and eighteenth-century ontological traditions" (1993:126). Walker and Mendlovitz (1990a:2) have put it very well: "State sovereignty offers only a misleading map of where we are and an even less useful guide to where we might be going."

39. If only for the purpose of scholarly persnicketiness, I note that the quote is from the drunken porter's speech in *Macbeth*, act 2, scene 3.

40. This last point would seem to indicate a situation that is "poststate" rather than "post-national."

41. Tilly argues that there are three possibilities for the future of European states: "(1) pro-liferation of states matching the more bellicose and/or diplomatically successful of those popu-lations; (2) continuation of the long-term trend toward consolidation into a decreasing number of homogenizing states, the limit being a single homogenizing state; (3) detachment of the principle of cultural distinctness from that of statehood" (1992:705).

42. The same policies have been promoted in the rest of the world by North-controlled multilateral institutions through a neoliberal agenda.

43. Nandy says: "Some scattered non- or post-modern concepts of state have, however, begun to emerge in response to the crisis of the nation-state in our times. For while it is an open question what forms the post-modern state will take, there is little doubt that the domin-ant concept of the state will have to be drastically altered … in response to the larger processes of democratization going on all over the world" (1992:271). Walker (1993:154) makes much the same point, arguing that democracy cannot be rethought without fundamentally reconstitut-ing ideas of state sovereignty.

44. Tilly contends that even in Europe, no large state "ever actually became a homogenous nation-state" (1992:710). See also the persuasive argument put forward by Krasner (1995) in this regard.

45. I do not think that Foucault naively believed that the economy was actually managed for the common welfare of all. However, it is significant that the rhetoric of rule changed so that the ideal of government became one of management for the welfare of all.

46. Foucault (1991:100) says, "The population now represents more the end of government than the power of the sovereign; the population is the subject of needs, of aspirations, but it is also the object in the hands of the government, aware, *vis-à-vis* the government, of what it wants, but ignorant of what is being done to it."

47. The use of concepts such as "governmentality" and "discipline" to discuss global regula-tion is obviously similar, but not identical, to the concept of "international regimes" (Krasner

1978; Young 1989). For criticisms of the regimes literature, see Agnew and Corbridge 1995; Ruggie 1982; and Walker 1993. Keck and Sikkink (1993) propose the notion of an "issue network" to highlight the role of nonstate actors in global environmental and human rights issues.

48. I am referring to what Young (1989:13) has termed an international order rather than an international regime.

49. The description that follows of the setting up of the new institute is taken from Khor 1995.

50. The collaboration between the KRRS and the Third World Network is a good example of a process described by Keck: "The reconfiguration of social struggles as environmental issues opens up new political resources and new allies for their protagonists. Labeling struggles as 'environmental' can change the grid of political and social relations in which they are embedded" (1994:97).

51. I have borrowed the term "intermestic" from Sanjeev Khagram (dissertation proposal, 1993, Department of Political Science, Stanford). Coalitions of farmers, as well as the global activities of NGOs, indigenous groups, and others support Walker and Mendlovitz's (1990a:7–8) argument that political communities are being reshaped from their formalization in state sovereignty into a multiplicity of forms that are a response to "profound structural transformations on a global scale."

52. Because most of these protests have occurred after my last research trip to India, I am entirely dependent on reports in the press for the quotes that follow. These reports gave little indication of the structural positions of the "peasants" who participated in the rally, although the fact that they were followers of the BKU and the KRRS would tend to place them among the better-off, landowning segment of the rural population. Many well-off farmers in Alipur, particularly jats, were enthusiastic supporters of the BKU.

53. Joshi's language befits a former UN official who returned to farming and took up the cause of agriculturists against urban and industrial interests.

54. Farmers in Karnataka (supporters of the KRRS) grow crops very different from those grown in western Uttar Pradesh, Punjab, or Haryana (supporters of the BKU). Sharad Joshi's followers are not the most powerful farmers in Maharashtra, the sugar barons who control rural politics and irrigation policies in the state, but from the stratum below them—that is, farmers who grow onions and other marketable food crops.

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New World, New Deal
A Democratic Approach to Globalization

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An Era of Fundamental Change

The United States enters the 21st century as the greatest beneficiary of the global system it helped create after World War II. As a power with unrivaled dominance, prosperity, and security, it must now lead the peaceful evolution of this system through an era of significant changes. Rapid shifts in technology and the embrace of markets by developing and formerly communist countries are shifting the balance of power among nations, between nations and nonstate actors, and between nations and global economic forces. New technologies are making the world much more interdependent. These technologies are accelerating the movement of goods, services, ideas, and capital across national boundaries. They are also displacing traditional security threats with nontraditional worries like international terrorism, organized crime, drug trafficking, and environmental degradation while strengthening the capacities of nongovernmental organizations (NGOs) to influence policy. Tension is mounting between the fixed geography of nation-states and the nonterritorial nature of global problems and their solutions.

The United States cannot shield itself from the effects of globalization. In today's interdependent capital markets, global perceptions of the stability of the American economy and the credibility of American economic policy can significantly affect the dollar's value and domestic interest rates. Despite its economic and military might, the United States cannot protect itself from global environmental problems like ozone depletion, climate change, and threats to biodiversity by acting alone.

The international economic challenges facing a new American president are twofold: first, to grasp the fundamental changes in the global economy, and second, to respond by fostering the conditions and institutions required for a world in which the United States can remain secure and prosperous. The central task of international economic policy is to help develop a new system of global economic relations—a task made essential, rather than simply desirable, by the enormous and irreversible changes now sweeping the world.

The Core

History indicates that a preeminent power cannot long maintain its global leadership without the support and cooperation of other nations in the pursuit of agreed-upon interests. Hence forging a consensus with other major powers on international economic objectives and how to share the costs of achieving them will be key tasks confronting the new president.

One of the new centers of power is a united Europe. On the economic front, the European Union (EU) is already a reality. A common currency, free trade, and more unified regulations are propelling cross-border flows of money, goods, services, and people. Cross-border mergers and restructuring are making European firms more competitive and European capital markets more flexible. With time, the EU will gain new members, including Poland, Hungary, the Czech Republic, Slovenia, Estonia, and Turkey. Other central European and Baltic countries will complete the transition from communism to capitalism and will either join the EU or establish close economic ties with it. Although Europe will not form a supranational state, policy coordination among member states will gradually increase. The EU already conducts trade negotiations as a single entity. With the creation of European economic and monetary union and the establishment of a common currency and central bank, Europe will increasingly act as one on financial and monetary issues.

The next Democratic president must define American economic relations with Europe in terms of the EU. As it has long done, the United States should encourage European unification, which is a stabilizing, modernizing force. But while Europeans share U.S. goals and values, they also increasingly resent American economic, political, and security hegemony. Thus the next president must work to ensure that Europe does not turn inward and that transatlantic economic, political, and security ties are strengthened. The Clinton administration has already laid the groundwork for ongoing high-level dialogue with the Europeans on economic cooperation and common global challenges through the New Transatlantic Agenda.

Russia is a thornier challenge. The West has a profound interest in Russia's transition to a market economy and has been trying to help. Although this transition has been marred by corruption, on-again, off-again reforms, and a dramatic 1998 financial collapse, progress has been made during the 1990s. Russian citizens enjoy more basic freedoms in speech, travel, and religion and are more connected to the rest of the world than at any time in the twentieth century. Russia has a functioning central bank and stock and foreign-exchange markets, and two-thirds of Russian property is no longer under state control. Moreover, the "meltdown" of the Russian economy predicted after its 1998 default has not occurred. In fact, over the last year, industrial production has increased, the trade balance has improved, and Russian firms show signs of restructuring. By exploding the myth in global capital markets that Russia is too big to fail, the 1998 financial crisis weakened Russia's corrupt oligarchs and forced the Russian economy toward greater efficiency in the face of more realistic budget constraints. Perhaps most important, those now vying for political leadership in Russia—even the Communists—agree that there is no real alternative to market reform.

The next Democratic president must continue America's constructive engagement with Russia, relying wherever possible on multilateral institutions like the IMF and on cooperation with other advanced industrial countries. American policy should continue to be multi-faceted, including trade; financial and technical assistance; educational exchanges; and programs to help Russia develop its civic institutions to combat corruption and safeguard an independent media. But America's interactions with Russia should not be based on illusions. Even with the West's financial and technical assistance, economic progress in Russia will be slow, unsteady, and largely dependent on political decisions made there. And the primary reason for the West's engagement with Russia is not economic—the Russian economy is too small to have much influence on global economic conditions—but geopolitical. Under the Clinton administration's leadership, more than 1,500 Russian nuclear warheads have been deactivated, and more than 300 missile launchers have been destroyed. Through the Cooperative Threat Reduction Program, the United States is working with the Russian leadership to try to ensure that Russian weapons of mass destruction do not fall into the wrong hands. Despite these successes, however, Russia poses a continuing nuclear-proliferation and security threat that must remain the central focus of American policy.

Asia poses quite different challenges. After a decade of stagnation, Japan is taking the first steps toward fundamental changes in its economic system. These changes are undermining traditional ways of doing business in Japan, including its lifetime employment system, its *keiretsu* supplier system, and its cross-shareholding system of "insider" corporate governance. Last year witnessed a dramatic increase in mergers and acquisitions in Japan, and foreign financial institutions were the dominant players. Foreign direct investment (FDI) increased sharply, although from a very low base. In a break with its past behavior, Tokyo has been promoting FDI, and the structural barriers to Japan's market that were a major irritant in U.S.-Japanese relations throughout most of the last quarter-century are gradually falling. Moreover, greater FDI will encourage imports into Japan by multinational companies operating there. Japan's imports will probably rise substantially as a share of its economy over the next decade, and U.S. firms—with their strong competitive position in information technologies—will likely win a significant share of Japan's market. Even during the 1990s, when slow growth depressed Japan's overall demand for U.S. imports, the U.S. surplus in services trade with Japan increased steadily, reflecting the strong competitive edge of American companies. Nonetheless, Japan's transition to a more open economic system will not make the substantial U.S.-Japan trade imbalance disappear, for two reasons. First, despite its economic difficulties, Japan has remained a formidable competitor in many global markets, and its painful restructuring will only increase its long-run competitiveness; and second, differences in aggregate growth rates and changes in the dollar-yen exchange rate will continue to be the major force behind changes in the bilateral trade balance.

During Clinton's first term, the United States engaged Japan in highly charged bilateral trade talks, relying on deadlines and threats. Both the goals of these negotiations and their sometimes combative tone reflected more than a decade of escalating trade deficits between the United States and Japan and frustration from American companies over structural barriers to Japan's markets. During Clinton's second term, trade

tensions began to ease as Japan's macroeconomic crisis intensified and as the terms of previous trade agreements were implemented. Currently, Washington is pursuing a two-pronged series of negotiations with Tokyo on deregulation and investment. Unlike prior talks, these negotiations have neither deadlines nor specific targets—nor much rancor.

The next Democratic president should continue this approach and maintain a high-level bilateral dialogue on trade. Such a dialogue lets both countries air complaints and avoid confrontation, thereby shielding other aspects of their relationship from commercial tensions. Regular high-level conversations also let the two countries develop joint initiatives on shared global economic challenges and common objectives for multilateral organizations like the WTO. Increasingly, the United States must treat Japan not just as an ally but as a partner in safeguarding economic, political, and military security in the Asia-Pacific, strengthening existing multilateral institutions, and building new ones.

The next Democratic president should continue Clinton's policy of constructive engagement with China. China's gradual emergence as a great power is a central feature of the new global system, and America's long-run interests are best served by China's stable evolution toward a more open, democratic system based on the rule of law. Constructive engagement with China does not guarantee this outcome, but it is the best option for increasing its likelihood. China may not be America's ally or partner—but as a result of constructive engagement, it has acted responsibly on issues of mutual importance like Hong Kong, North Korea, and Asia's financial crisis.

Constructive engagement is not an endorsement of China's human rights behavior. But revoking normal trading relations with China or blocking its WTO membership will not improve such behavior. Indeed, the opposite is true. Commercial considerations may seem crass when compared with human rights, but impeding commercial relations with China would impede the flow of information about Western culture, ideas, and business practices to China's emerging middle class and weaken reformers in the state and party leadership.

What about China's trade behavior? Don't large U.S. deficits with China imply that it engages in unfair trading practices? Won't China violate the rules of the multilateral system once it gains admission to the WTO and its trading partners lose leverage? Probably not. China does not enjoy a persistent current-account surplus—a defining characteristic of a mercantilist state. Moreover, China has encouraged FDI as part of its development strategy. Indeed, foreign-funded companies in China accounted for more than half of the growth of its exports during the last decade. China's openness to FDI will mean increased imports in the future. In the final WTO deal announced last November, China made big concessions on trade in manufactured goods, agriculture, and services. It further yielded to America's insistence on special protections against unexpected import surges from China. The consensus among China experts is that the WTO deal is a bold—some would say desperate—move by China's leaders to forge ahead with market reforms despite substantial adjustment costs. Finally, China's performance in other multilateral institutions indicates that it will honor its end of the bargain. And should violations occur, the United States will be able to turn to the WTO dispute-settlement mechanism to enforce compliance.

Another controversial aspect of economic relations with China is whether and how to regulate American exports of dual-use technologies—those with substantial military and commercial applications—to China and other countries that may pose security risks. Banning the export of such technologies seems to some the simplest way to safeguard American national security. But this approach is both ineffective and counterproductive. The United States is not the sole source for such products, so a unilateral ban would merely drive would-be importers to other suppliers. And for many dual-use goods, America's national security hinges on the success of their American producers in the commercial marketplace. Unilateral export controls undermine this success and thereby endanger national security. This realization lies behind the gradual easing of export controls by the American government since the end of the Cold War, a trend that the next administration should continue.

Like China, many other emerging nations are restructuring their political and economic systems, pursuing market policies, and shifting their world-views. The United States must work to engage these new players, together with existing powers, in the processes and institutions on which governance of the global economy depends.

Two of these new players—India and Brazil—are virtually certain to develop significant regional, if not global, influence and are strategically important to the United States. India has the smaller economy of the two but seems closest to a sustained breakthrough in economic growth. More rapidly than is generally realized, India is likely to become an important factor in the strategic equation in Asia as a whole. And Brazil, as a result of its size, economic development, and leadership of the Mercosur trade bloc, has already become an important factor in Latin America. Over time, other nations like South Korea, Mexico, and South Africa will probably grow in influence and become part of the complex coalitions of nations required to address global economic problems.

Putting It Together

The next Democratic president must strengthen America's alliance with the other major players—Europe and Japan—to reshape existing multilateral institutions and rules and create new ones as necessary. Emphasizing cooperation with these nations will also discourage them from turning inward or creating competing economic blocs. The United States, Europe, and Japan still account for about two-thirds of global GDP. They have similar levels of per capita GDP, effective legal and regulatory regimes, and highly developed capital markets. All trade and invest more with each other than with other regions of the world, and all are becoming information and network economies. The United States, Europe, and Japan should, therefore, be able to agree on many of the new challenges posed by globalization and the information revolution; negotiate free-trade areas in services, investment, and electronic commerce; adopt common guidelines for intellectual property and privacy; develop common regulatory standards in sectors such as biotechnology, the environment, health, and food safety; and agree on qualifications for professions and industries. New forms of cooperation and joint decision-making among these three great powers should be

carefully designed to support the multilateral system, and agreements among them should be open to participation by other countries or adoption by other multilateral institutions.

Historically, the G-7 group of highly industrialized nations has promoted economic cooperation among the United States, Europe, and Japan by engaging their heads of state in annual discussions about mutual concerns and creating working groups in each nation to develop mutual solutions. In recent years, however, the G-7 process has begun to lose its relevance because it excludes other nations important to the global economy. Because an ongoing, high-level dialogue among the heads of the world's major economic powers is important to the United States, the next Democratic president should encourage the G-7 to broaden its membership to include Russia (which is already included in most discussions), Brazil, China, and India.

The recent failure of the WTO talks in Seattle demonstrates the foolishness of launching global trade talks before developing a consensus on the issues among the United States, Europe, and Japan—still the largest trading nations in the world. But the lessons of the Seattle debacle go deeper.

First, the low-hanging fruit in multilateral trade negotiations has already been picked. In previous rounds, tariffs were slashed and quotas eliminated for most trade in manufactured products. Future negotiations will focus on agriculture and services—sectors that are politically sensitive and highly regulated by individual countries, including the United States—and will involve such traditionally domestic issues as antitrust policy, consumer safety, and other regulatory questions. Crafting multilateral agreements on such issues will be a long, painful process. And enforcing compliance with such agreements, which require nations to change entire areas of domestic law, will prove much harder than enforcing compliance with previous agreements barring overt trade barriers. Establishing a permanent executive committee within the WTO to replace the loose ambassadorial mechanism that currently proposes new multilateral trade talks could help. And the pointless practice of holding biennial WTO meetings at the ministerial level, even when there is nothing substantive to discuss, should end.

Second, given the complicated nature of future issues and the unwieldy number of future participants, the "global round" approach to trade talks—involving all WTO participants in a comprehensive agenda requiring bargains across several sectors—may have outlived its usefulness. Since it will be so difficult to forge consensus on the agenda for another global round, negotiations focused on liberalizing trade in individual sectors are an attractive alternative. In recent years, such negotiations have produced significant agreements in the diverse areas of information technology, telecommunications, and financial services. Moreover, since there is still much to do to implement these agreements, consolidating their achievements may be the best way to strengthen the multilateral trading system and achieve real progress over the next few years.

Third, to fight the burgeoning backlash against globalization and build public trust, WTO operations must become more transparent. At the same time, new multilateral approaches must be developed to address global concerns in other areas such as the environment, labor rights, and human rights. The next Democratic president

should encourage such efforts while making sure that the wto maintains its focus on trade. The wto exists to develop and enforce trade agreements, and such agreements exist to foster trade. The wto is not the appropriate forum for other issues, although it could adjust over time to permit trade restrictions to enforce multilateral pacts on issues negotiated elsewhere.

In the meantime, the United States should eschew unilateral trade restrictions, including sanctions, to compel other nations to comply with American laws on the environment, labor practices, or human rights. During the last several years, America has imposed some form of unilateral economic sanctions against 26 countries, accounting for half the world's population. These sanctions have not achieved their goals; indeed, sanctions often harm exactly those they seek to help. And sanctions have cost the United States about $20 billion in lost exports, 200,000 jobs, and the goodwill and trust of its allies abroad.

Finally, the next Democratic president must continue to educate the American public about the ways the U.S. economy is helped by enforceable multilateral trading rules. As the largest exporting country and the one with the lowest trade barriers, the United States reaps the greatest benefits from trade liberalization. The more countries trade with one another, the better off they are. But the more they need multilateral rules to settle disputes, the more these rules influence domestic practices. Still, the wto is not a world government that can override or proscribe its members' laws. If the United States loses a case before the wto, it can either retain its domestic laws and accept trade sanctions from the complaining nation or adjust these laws to eliminate discrimination against foreign producers.

Regional economic integration can complement and spur multilateral liberalization. It can also contribute to political stability. For these reasons, the next Democratic president should build on the efforts of the Clinton administration to promote regional cooperation and liberalization in both Asia and Latin America. The Asia-Pacific Economic Cooperation forum is the basis for a sound economic strategy in the Pacific basin. Its membership boasts a number of important regional players (among them China, Japan, South Korea, Mexico, and the members of the Association of Southeast Asian Nations), it provides a useful forum for the region's heads of state, and it is committed to trade liberalization and cooperation in fields from telecommunications to basic infrastructure.

Building on the success of the North American Free Trade Agreement, the United States has convinced Latin American countries to agree on a broad economic agenda whose centerpiece is the creation of a Free Trade Agreement for the Americas (ftaa), with additional cooperation on the environment, human rights, crime, and other global issues. The next Democratic president should accelerate the ftaa process, which has been hampered by the absence of fast-track trade authority. Without such a process, American influence in the region will diminish, and the likelihood of competing economic zones will increase.

For Richer, for Poorer

As globalization has intensified, the gap between per capita incomes in rich and poor countries has widened. Although this trend has been around for the past two centuries, it has accelerated in recent years. For the many emerging countries that already have the institutions and income levels to attract private capital and the education levels to prosper in the new information age, the private sector will fuel continued economic development. Indeed, for most of these countries, the economic development problem—although substantial—is best understood as an internal poverty problem. But this is not so for the nations of Africa, many of which are being left behind.

What should the next Democratic president do to address human needs and spur economic development in the most impoverished nations? First, the White House should espouse complete debt forgiveness for the world's poorest nations. Second, the president should lobby to increase America's inadequate foreign-aid budget and redirect it toward programs to meet basic human needs—for example, a U.S.-led effort among the developed nations to counter the AIDS epidemic in Africa or to establish a special fund to help the poorest nations honor multilateral environmental agreements. Third, the president should work with other advanced nations to reduce tariffs, ease antidumping penalties, and lower quotas on trade with developing countries. Finally, the administration should foster cooperation with the NGOs that already deliver more development assistance than the entire U.N. system, including the World Bank and the IMF.

Earth in the Balance

The next Democratic president should establish a bipartisan group of experts to assess the lessons learned from recent financial crises, evaluate the adjustments already under way, and recommend additional changes. At the same time, the president should pledge America's commitment to the World Bank and the IMF, emphasizing their importance while recognizing the need for further reform. Such reform should be guided by two considerations. First, these institutions must adjust to the vastly greater scope and scale of private cross-border capital flows. Second, they must find ways to engage more of the public in the countries to which they lend—both to use their resources more efficiently and to help promote the stable civil societies on which successful economic development depends.

A growing number of environmental problems—ozone depletion, global climate change, threats to biodiversity—are international in scope and require cross-border solutions. Industrial countries, including the United States, are disproportionately responsible for most of these environmental problems, but developing countries are also rapidly damaging common environmental resources. Solutions, therefore, require the participation of both developed and developing nations. But since the costs and benefits of addressing common environmental problems vary among countries, as do the available resources, global agreements must include effective transfer mechanisms and flexibility about the methods used by different countries to achieve environmental targets.

No vehicle exists for nations to negotiate new multilateral pacts on environmental issues. That is one big reason why environmentalists have focused on the WTO. But using the WTO as the forum for multilateral environmental negotiations both endangers further trade liberalization and raises the risk that trade will be restricted in the name of environmentalism but in the service of protectionism. To head off these risks, a new Democratic president should propose creating a new Global Environmental Organization to develop and enforce new international agreements on specific problems, using the successful Montreal protocol on slowing ozone depletion as a model.

In recent years, a growing number of NGO at home and abroad have called for a set of internationally recognized and enforced labor standards that would ban child labor and sweatshops and support workers' rights to organize. Logically, labor rights and standards are development and political issues, not trade issues. There is no evidence that trade undermines labor standards and leads to an international "race to the bottom." In fact, the opposite is true. Most global trade still occurs between developed countries, which enjoy the highest wages, labor standards, and productivity levels. And as trade and integration in the global economy have helped poor countries develop, their wages, productivity, and labor standards have improved. Developing countries that have strengthened their labor standards have done so because of more trade and integration, not less.

Despite such evidence, labor standards will move up the agenda of international economic negotiations as global integration continues. And the next Democratic president will have to be sensitive to the desires of both NGO and organized labor for global workers' standards. Given the opposition of most of the rest of the world, however, this will not be easy. So Clinton's heir should continue to promote his reasonable Seattle approach of establishing a multilateral discussion group to examine some labor rights issues, including child labor and sweatshop conditions. The group should include the International Labor Organization, the United Nations, and the World Bank, and it should be charged with reporting its findings to the WTO by a specified date. Second, the president should encourage the private sector to develop labeling systems and codes of conduct certifying compliance with core labor standards. One promising effort is a program called Social Accountability 8000, launched by the Council of Economic Priorities and a group of influential American companies to encourage firms to comply with labor and human rights standards. Another is the United Nations' proposed Global Compact with Business, under which the U.N. will help multinational companies meet internationally accepted principles of human rights, labor practices, and environmental standards.

Third, the president must continue to educate the American people about the way trade boosts labor standards by highlighting American firms that have improved working conditions in their foreign operations. Polls indicate that most Americans would rather buy from companies committed to ending worker abuses and that American consumers would be willing to pay somewhat more for products made in worker-friendly environments. In addition, a growing number of American multinationals recognize that bad publicity about working conditions in their foreign operations can damage their reputations and bottom lines. A new Democratic president

can effectively use the bully pulpit to shine the spotlight on American firms that are doing well by doing good and encourage a "race to the top."

Nations must also begin to work with one another and the business community to define appropriate policies for the world of e-business. Without cooperation, different policy regimes will develop within different regions and nations, each attempting to govern phenomena that are inherently transnational. Different sets of rules will in turn generate unnecessary transaction costs and slow the diffusion of wealth and knowledge made possible by the new technologies.

To date, the Clinton administration has avoided regulation of the networked economy at home and made the case for a similar approach abroad. American officials had hoped to include digital issues on the agenda for the next global trade round, but that has been delayed by the failure of the Seattle talks. In addition, the Seattle discussions suggest that even when a new round begins, negotiations will focus on highly visible, politically contentious issues such as agriculture, textiles, and dumping that traditionally dominate trade debates, rather than on digital issues.

Therefore, it is time to develop a specific multilateral process focusing exclusively on such issues. This should be a principal objective of the next Democratic president. There are three logical steps: first, establishing a trade and investment round within the WTO focusing specifically on e-commerce; second, developing a set of basic principles for such talks, with a broad agenda including crime prevention, privacy, intellectual property, taxation (including the possible establishment of a multilateral tax clearing-house), and dispute settlement processes; and third, providing access to the networked economy for all nations and regions. The last step will require targeted lending programs funded by the World Bank, NGOs, and developed countries to help the poorest countries build the necessary infrastructure.

Stay on Target

The United States has benefited from globalization. Throughout much of the 1990s, exports accounted for about a third of U.S. growth. Even when American exports slowed in response to recessions in emerging markets, the same financial crises causing these recessions also increased flows of capital into American financial markets and reduced import prices for American consumers, fueling America's continued economic expansion during the last three years. This expansion—now the longest in the nation's history—has produced the lowest unemployment rate in more than 30 years and raised incomes for all groups of American workers, including the least skilled. True, the nation's trade and current-account deficits have hit record levels, but these primarily reflect the relative strength of the American economy compared to its trading partners and the resulting strength of the dollar, not an increase in protectionist barriers abroad.

It is easy to understand why a populist backlash against globalization has taken hold in much of the world, plagued by an endemic poverty made worse by recent contractions. As hundreds of millions of people in emerging markets have seen their jobs and incomes decimated by global financial shocks, modern information

technologies have shown them images of American prosperity—and of American officials and business leaders lecturing them about the necessity of painful sacrifice. Signs of an emerging backlash against globalization in the United States, although perhaps harder to justify, are inflamed by some of the same concerns: rising income inequality, job insecurity in a rapidly changing and harshly competitive environment, and a sense of powerlessness and uncertainty about the future.

Economic integration among nations, although beneficial overall, does create winners and losers. And even many winners fear that the next wave of change spawned by footloose capital and technological change will make them losers. To allay such concerns about globalization, the next American president must design policies to sustain America's expansion and give Americans the tools they need in the global marketplace. Among the most important of these are lifetime education and training opportunities, portable and fair pensions and health-care benefits, and a safety net to support incomes during periods of adjustment or recession.

At the same time, the next president must work with the leaders of other nations to develop multilateral agreements and institutions to ease the economic downsides of globalization and address new global issues. As President Clinton noted in his 1998 speech before the Council on Foreign Relations, the multilateral system must evolve toward a kind of "Global New Deal." The painful experiences of many transition economies and the unexpected financial crises of the 1990s have reminded the world that to work well, markets require a strong commitment to the rule of law, transparent financial institutions, legitimate corporate and political governance structures, and adequate social safety nets. As the new millennium begins, a new Democratic president will have the opportunity to lead the world in creating institutions and policies to sustain a more equitable process of globalization built on the marvels of the market and modern technologies.

Individualism, Holism, and Environmental Ethics

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Environmental Holism

Neoclassical economists have been telling us for years that if we behave in egoistic, individualistic ways, the invisible hand of the market will guide us to efficient and sustainable futures. Many contemporary Greens also have been telling us that if we behave in holistic ways, the invisible hand of ecology will guide us to healthy and sustainable futures. In this essay, I argue that neither environmental individualism nor first-order environmental holism—to which many ecologists and environmentalists appear to subscribe—will provide environmental sustainability. There is no invisible hand, either in economics or in ecology. Humans have no guaranteed "tenure in the biosphere" (Passmore, 1974, pp. 75–96). Likewise there is no philosophical "quick fix" for planetary problems, either through the environmental individualism of Feinberg (1974), Frankena (1979), and Regan (1983), or through the first-order environmental holism of Callicott (1989) and Leopold (1968). The correct path is more complex and tortuous than either of these ways. I argue that the most ethically defensible way to reach planetary protection and a sustainable environmental future probably is through a middle path that I describe as "hierarchical holism."

Environmental Individualism and Its Problems

As expressed in a classic article by Joel Feinberg, the cornerstone of environmental ethics in the individualistic tradition is the view that because only individual, sentient beings have interests, therefore only they can be said to be moral patients, beings to which we have duties (Feinberg, 1974, pp. 43–68). William Frankena's argument here is that we owe no moral consideration to beings or systems that are merely alive but have no conscious experience because they are incapable of pleasure or suffering. Frankena maintains that to accord the status of "moral patients" to systems or non-conscious beings is to beg the question of ethical value and to make a claim that is simply "incredible" (Frankena, 1979, pp. 3–20).

Environmental individualism, however, is questionable on the grounds of both its philosophical intuitions and its consequences for environmental protection and sustainability. From a philosophical point of view, the environmental individualism of Frankena and Feinberg is suspect because it relies in large part on at least two problematic intuitions or postulates:

P1: *We cannot harm a being if it is not capable of consciousness*

P2: *Physical or psychological suffering is the only type of harm that we impose on another.*

Contrary to **P1**, however, it seems plausible to claim that if we destroy or even increase the probability of death of a living, nonconscious being—such as a large old tree—we cause it harm. Moreover we seem to cause harm to such a being for the same reason that we cause humans harm—by increasing their probability of death— even when they do not know it and even when there is no physical or psychological pain or suffering involved. As all those conversant with quantitative risk assessment realize, increasing my average annual probability of fatality—induced by exposure to a particular pollutant such as benlate, for example—clearly harms me, even when I do not know it and even when there is no clear physical or psychological harm involved. I am harmed by having my life shortened or my death made more probable, even if such shortening or heightened probabilities are associated with no obvious physical symptoms of suffering. To ignore such probabilities is to presuppose that harm is simpler, more deterministic, more physical, and more obvious than it is. Contrary to what Feinberg, Frankena, and Parfit suggest, physical and psychological suffering does not appear to exhaust the category of harm (Parfit, 1984; Shrader-Frechette, 1987, pp. 50ff.; 1988, pp. 75–96). It seems equally plausible to claim that increasing the probability of death is an instance of harming a being. Likewise, to presuppose that consciousness or sentience is necessary for a being to be harmed is to presuppose a purely psychologistic definition of "harm." Psychological responses may be a sufficient condition for a person's being harmed, but clearly they are not a necessary condition. The presupposition errs because it confuses being harmed with knowing that one is harmed. Knowing that one is harmed does not seem to be a necessary condition for being harmed. And if not, then ethical individualists may err in assuming that beings can be harmed only if they are conscious and capable of suffering (Shrader-Frechette, 1988, pp. 75–96).

The environmental individualism of Frankena and Feinberg also appears problematic because it is premised on a metaphysics and science that presuppose that we harm individual sentient beings "one at a time." On the contrary, we can jeopardize obvious ecological interdependencies, system relationships, and cases of coevolution, despite our inabilities to describe fully these relationships through precise, predictive, general ecological theory (Shrader-Frechette and McCoy, 1993). These interdependencies show that the consequences of our actions can affect not merely individuals but a variety of biotic systems and relationships—such as the carbon cycle and the nitrogen cycle—that could be considered as moral patients. Moreover, to say that one can harm the carbon cycle and nitrogen cycle does not seem any more metaphorical a

case of harm than to say that one has harmed the fuel-injection system of an auto-mobile or the due-process system of a nation. And if so, then there may be both philo-sophical and metaphysical grounds for questioning environmental individualism and for subscribing to some sort of ethical holism.

First-Order Environmental Holism and Its Problems

Even Frankena opens the door to some version of ethical holism. For example, he admits that G. E. Moore and W. D. Ross were not individualists in the classical ethical sense. Moore held that a beautiful world would be intrinsically good even if there were no sentient beings to enjoy it, and Ross claimed that a state of affairs in which happiness is distributed in proportion to merit or virtue is intrinsically good (Fran-kena, 1979, pp. 3–20; Moore, 1903, p. 27). If the insights of persons such as Moore and Ross are plausible, then ethical holism, as such, may not be as philosophically suspect as persons like Feinberg have alleged. We shall argue that what does seem problem-atic, however, are particular versions of holism, like that of J. Baird Callicott.

Callicott's first-order holistic environmental ethics, following Aldo Leopold, "locates ultimate value in the biotic community and assigns differential moral value to the constitutive individuals relatively to that standard" (Callicott, 1989, p. 37). He says that, "in the last analysis, 'the integrity, beauty, and stability of the biotic community' is the measure of right and wrong actions affecting the environment" (p. 58). In Calli-cott's view, the biotic community has not only moral considerability but primacy; he writes: "not only are other sentient creatures members of the biotic community and subordinate to its integrity, beauty, and stability; so are *we*. … [H]uman beings are equally subject to the same subordination of individual welfare and rights in respect to the good of the community as a whole" (pp. 92–93). In other words, he has a first-order ethical principle to optimize the welfare of the biotic community. Callicott has no second-order principles to use in adjudicating disputes between community and individual welfare because individual welfare is always subservient to community wel-fare. Thus Callicott subscribes to a first-order environmental holism.

Defending Leopold's (and his) ethics as Darwinian and sociobiological, Callicott argues persuasively that this holistic ethics is a natural result of the evolutionary extension of the boundaries of the moral community. Once we see land as a "biotic community," says Callicott, "the land (or environmental) ethic" emerges. The "con-ceptual and logical foundations of the land ethic," he says, are evolutionary and eco-logical biology, "a Copernican cosmology, a Darwinian protosociobiological natural history of ethics, Darwinian ties of kinship among all forms of life on earth, and an Eltonian model of the structure of biocenoses all overlaid on a Humean-Smithian moral psychology. Its logic is that natural selection has endowed human beings with an affective moral response to perceived bonds of kinship and community member-ship and identity; that today the natural environment, the land, is represented as a community" (Callicott, 1989, pp. 82–83). More specifically, Callicott argues that the bi-otic community, currently viewed as the ecosystem, has moral considerability because it is the object of a specially evolved public affection that all psychologically normal humans have inherited from a long line of primates (Callicott, 1989, p. 86). Providing

for the moral considerability of nature as a whole, however, is problematic because this value apparently must be grounded in some property. Yet anyone could reasonably deny that a particular natural or metaphysical property, e.g., "stability," is truly good. To counter this difficulty, Callicott argues that "good and evil, like beauty and ugliness, rest in the final analysis upon feelings or sentiments which are, as it were, projected onto objects, persons, or actions and affectively 'color' them" (Callicott, 1989, p. 160). In so arguing Callicott realizes that "intrinsic or inherent value in nature in the strict, objective sense of the terms must by definition be abandoned if one assumes a Humean subjectivist axiology" (Callicott, 1989, p. 161). Nevertheless, he says, this subjectivist axiology allows natural biotic communities to "be valued *for themselves*" (p. 163). It also escapes relativism, according to Callicott, because sociobiology has achieved a "consensus of feeling" through the "biologization of ethics." Human ethical feelings, in turn, "have been standardized by natural selection" (p. 164).

Although first-order environmental holism, as such, may be ethically defensible, there are problems with some prominent versions of it espoused by philosophers and environmentalists such as Callicott. Callicott's ethics, for example, fails because: (1) there is no biologically coherent notion of "community" robust enough to ground either contemporary scientific theory in community ecology or environmental ethics; (2) it is not possible to safeguard the "rights" of biological communities; (3) in relying on natural-selection mechanisms to deliver it from relativism, Callicott's evolutionary ethics has lost its normative dimension; and (4) his version of ethical holism appears to sanction what Regan calls "environmental fascism." Let's examine these four points in order.

Following Leopold (1968), Callicott argues that all creatures are subordinate to the integrity, beauty, and stability of the biotic community. This first-order ethical imperative is problematic from a biological point of view because there is not a clear notion of balance, integrity, stability, or community. There is, for example, no clear sense in which one can claim that natural ecosystems proceed toward homeostasis, stability, or balance and no consensus among ecologists on the ecosystemic view of balance or stability (Peters, 1991; Shrader-Frechette and McCoy, 1993, chp. 2; Shrader-Frechette and McCoy, 1992, pp. 184–199; Taylor, 1986, p. 299), although there has been significant philosophical work on these concepts (Westra, 1994). Likewise, there is almost no support for the diversity-stability view held by MacArthur, Hutchinson, and Commoner (Connell, 1978, pp. 1302–1310; Goodman, 1975, pp. 237–266; Levins, 1974, pp. 123–138; Lewin, 1984, pp. 36–37; May, 1973; MacArthur, 1955, pp. 533–536; McIntosh, 1985, p. 142; Norton, 1987, chp. 4, sect. 2; Paine, 1969, pp. 91–93; Sagoff, 1985a, pp. 107–110; Soulé, 1986, pp. 6–7; Taylor, 1986, p. 8). The reasons for the disfavor attributed to the view of MacArthur et al., are both empirical and theoretical. Salt marshes and the rocky intertidal are two of the many counterexamples to the diversity-stability view (Sagoff, 1985a, p. 109; Sagoff, 1985b, p. 81), and empirically based counterexamples have multiplied over the last two decades. May, Levins, Connell, and others have seriously challenged the diversity-stability hypothesis on both mathematical and field-based grounds (Connell, 1978; Levins, 1974; May, 1973; McIntosh, 1985, pp. 187–188; Sagoff, 1985a, p. 109). Even though some laypersons and policymakers appeal to the hypothesis, most ecologists have either repudiated it or cast strong doubt on it (Commoner, 1971, p. 38; Myers, 1983; U.S. Congress, 1973).

Doubts about balance and stability have arisen, in part, because ecologists cannot say what it would be, in a noncontroversial, precise, and nonquestion-begging way, to hinder some biological "balance," "stability," or "integrity." Not only are there a variety of competing definitions for each of these terms, but whether a particular term is applicable in a specific situation is largely a function of the temporal and spatial scale that is chosen. Moreover, communities and ecosystems regularly change and regularly eliminate species. Nature does not merely extirpate species or cause them to move elsewhere because their niches are gone. And if not, then there are no clear *ecological* grounds for defining and preserving some partial notion of balance or stability. Hence, it is not clear how Leopold's and Callicott's appeal to these ecological concepts can help defend a holistic environmental ethics. It will not do to say that what happens naturally is good, whereas what happens through human intervention is bad; this would be to solve the problem of defining "balance" or "stability" in a purely stipulative or *ad hoc* way. Nor can the criterion be merely that it is wrong for humans to do quickly (e.g., cause lake eutrophication) what nature does more slowly. One also would need both second-order ethical arguments (given by neither Callicott nor Leopold) that accelerating ecosystemic changes is bad, even if the changes themselves are natural, and second-order arguments that a particular account of what is "natural" is defensible.

Another conceptual problem besetting environmental appeals to ecological balance, wholeness, or integrity is that ecologists must take into account thousands of different communities, species, and individuals, relative to the health or balance of an ecosystem or the biosphere. It is not clear how to define the health of a system (as opposed to that of an individual), because system health is relative to some specific goal. Nor is it obvious how to define the system at issue. The ecological problem of defining the system at issue is analogous to the economic problem of defining a theory of social choice and choosing some "whole" that aggregates or represents numerous individual choices. Defining an ecological "whole" to which Callicott and Leopold can refer is especially problematic, both because the biologists (e.g., Clements, Elton, Forbes) cited by Callicott to explicate his views are no longer accepted by most contemporary scientists as having correct views about ecological communities, and because the contemporary variant of Clements's position, the GAIA hypothesis, has been rejected by most ecologists as unproved metaphor or mere speculation. At best it is a hypothesis. They admit the scientific facts of interconnectedness and coevolution on a small scale, but they point out that particular ecosystems and communities do not *persist* through time. Hence, there is no clear referent for the alleged "dynamic stability" of an ecosystem or community (Goodman, 1975, p. 239; MacArthur, 1955; Norton, 1987, chp. 4 sect. 2; Shrader-Frechette, 1985, pp. 77–92; Shrader-Frechette and McCoy, 1993, chp. 2).

Moreover, it is not clear which (of many) alleged ecological communities whose balance or stability ought to be sought. One could seek to "stabilize" (whatever that is taken to mean) the ecosystem, or the association (McIntosh, 1985, pp. 44, 79, 107), or the trophic level, for example. Or, if one is a holist, then why should not the collection of communities and ecosystems be stabilized or optimized, namely, the biosphere? Optimizing the well-being of a particular community, however, does not lead to the

optimization of another community in the biosphere or of a particular association. If not, then Callicott has little scientific basis for choosing a given "whole" as the unit that is to be stabilized or optimized (McIntosh, 1985, pp. 126ff., 157ff., 181–82ff., 252; Shrader-Frechette, 1985, pp. 77–92). One can make a *value judgment* to optimize the well-being of a particular community or the biosphere, but this is just that, a *value judgment.* It is not part of an empirically defensible ecological science.

Admittedly, once one makes a value judgment about which particular whole one wants to stabilize or balance, it is obvious that specific ecological conclusions are valid within certain spatial and temporal scales. Nevertheless, a given ecological conclusion regarding balance or integrity, for example, typically holds for some "wholes" (e.g., communities) and for some temporal and spatial scales but not others. Ecologists cannot optimize the welfare of all the different wholes (each having a different spatial and temporal scale) at the same time. Because they cannot, there is no general level at which ecological problem solving takes place. Hence, there is no general temporal or spatial scale within which a stable "whole" is exhibited. Also, because there is no general, universal ecological theory to which one can appeal in defining the "whole" about which Leopold and Callicott speak, ecologists are forced to work on a case-by-case basis. They recognize that there is no universal level, across all communities, at which some balanced or stable whole exists. In part this is because numerous alleged "wholes," e.g., populations, exhibit density vagueness rather than density dependence, while other wholes do not (Strong, 1986, pp. 257–268). Also, many ecosystemic or holistic explanations are neither falsifiable nor even testable. For this reason, at least one scientist called ecosystems ecology "theological ecology" (McIntosh, 1985, p. 193). There is neither a clear definition of what it is to be balanced or stable, nor a clear definition of the whole that is allegedly balanced or stable. The absence of both definitions is attributable ultimately to the fact that theorists do not agree on the underlying processes that structure communities and ecosystems (Cody and Diamond, 1975; Gilpin and Diamond, 1984, pp. 298–315; Lewin, 1983, pp. 636–639; Simberloff, 1983, pp. 626–635; Strong, Simberloff, Abele and Thistle, 1984).

A second biological problem with Callicott's holism concerns his argument in favor of duties to the biotic community and against according rights to individual members of the biotic community. He argues against the latter because he says that it is not possible to safeguard the rights of each individual; he says that such a "safeguard" would stop all trophic processes beyond photosynthesis (Callicott, 1989, pp. 43, 51). The biological problem with Callicott's reasoning here is that nature does not respect communities either. There is strong biological evidence (e.g., fossilized pollens) of radical changes in community composition and structure throughout history (Graham, 1986, pp. 300–313; Strong, 1986). These changes, in turn, suggest that there is no such thing as a stable or balanced community "type" existing through time. Rather the types only appear stable because our time frame of examination is relatively short. Even if climate and environment remained the same, however, communities could not be classified into balanced or stable "types." Both spatial and temporal fluctuations undercut any universal notion of a stable or balanced community. And if so, then arguments analogous to those that Callicott uses against Regan can be used against him. Just as Callicott argues against Regan's individual rights, by saying that

nature does not respect them, so also we can argue against Callicott's notion of stable communities, by saying that nature likewise does not respect them. If nature does not respect ecological communities, we need specific arguments to show how and why humans can be expected to do so.

A third problem with Callicott's using biology to undergird his holistic environmental ethics is that he destroys the normative dimension of his ethics. This problem occurs because Callicott reasons, quite correctly, that in relying on a Humean notion of ethics, he is open to the charge of ethical relativism. He avoids this relativism by postulating that ethical uniformity/unanimity is achieved by means of natural selection. Callicott claims that "human feelings ... have been standardized by natural selection" (Callicott, 1989, pp. 82ff.). His analysis fails to show that natural selection standardizes ethics in the requisite sense, however, because one can be neither morally blamed for doing something contrary to natural selection nor morally praised for acting in accord with natural selection. Either a certain ethical tendency is selected for, or it is not. As a result, behavioral uniformities that are explained through natural selection are descriptive, not normative. Hence Callicott may have saved his ethics from relativism, but at the price of its "oughtness" or normative character.

A similar normative problem occurs when epistemologists attempt to explain rules or norms of knowing by means of natural selection; their "evolutionary epistemology," apart from other difficulties, is naturalized, descriptive, and non-normative. It is no longer epistemology, but psychology (Bartley, 1987, pp. 24–25; Hookway, 1984, pp. 1–16; O'Hear, 1987, pp. 19–23). Similar to evolutionary epistemology, Callicott's evolutionary ethics cannot take account of the fact that arriving at ethical beliefs/actions relies on cognitive and evaluative aims, on anticipating experience, solving problems, and so on. The "evolution: ethics" analogy therefore breaks down because, although evolution does not operate according to ends or aims, ethics does. Evolution and natural selection ignore the contribution to reflective self-understanding of ourselves as agents of inquiry, even though this reflective agency is at the core of ethical knowledge (Hookway, 1984, pp. 13–15; O'Hear, 1987, pp. 27–29). Moreover Callicott's natural-selection explanation fails to explain how someone could make the *first* correct ethical guess or have the *first* ethical feeling; at best, natural selection could only explain later correct guesses or feelings (Skagestad, 1978, p. 615).

Evolution and ethics are also disanalogous in that, in ethics, we select theories/behavior on the basis of hypotheses about the facts and our evaluations of them. In evolution, however, the facts themselves, neither our hypotheses nor our evaluations of them, are the guide. Hence, evolution is blind both to an organism's evaluations of the facts and to the adaptive need of the organism, whereas ethics is blind to the facts and can see only evaluations or hypotheses about the facts (Skagestad, 1978, p. 617). For all of these reasons, Callicott's appeal to natural selection to ground his ethics appears to create more philosophical problems than it solves.

Apart from natural selection, Callicott's and Leopold's versions of ethical holism also are problematic because they sanction what Regan calls "environmental fascism" (Regan, 1983, p. 262; Taylor, 1986, p. 118; Rolston, 1987; Taylor, 1986, pp. 45–46, 225–226, 246, 259, 281–282). If one follows Callicott's and Leopold's first-order ethical principle of subordinating the welfare of all creatures to the integrity, beauty, and stability of

the biotic community, then one subordinates individual human welfare, in all cases, to the welfare of the biotic community. This means that a second-order conflict over community versus individual welfare could not arise. With no second-order ethical principles to protect humans, under at least some circumstances, massive human deaths or violations of basic civil liberties could be justified, even required, on the grounds that allowing them would help check the population problem and contribute to the good of the biosphere. Such an argument has already been proposed by Garrett Hardin in his famous discussion of "lifeboat ethics" and by a number of "deep ecologists" following in the tradition of Thomas Malthus, Paul Ehrlich, and David Foreman (Hardin, 1974, pp. 561–568; Young, 1990, pp. 128ff.). Of course, Callicott denies that his ethics would lead to "environmental fascism." He claims that his environmental ethics presupposes that all existing systems of human rights would remain in existence (Callicott, 1989, p. 93). However, his verbal response here does not solve the conceptual problem, and for two reasons. First, it is inconsistent with his continuing claims for the priority of the biotic community. If the welfare of the biotic community takes priority over human rights, as he claims, then existing systems of human rights would no longer be in operation, contrary to Callicott's claims. Second, apart from inconsistency, it is impossible to maximize two variables and hence impossible to give priority position to both the biotic community and to human rights. If Callicott does the former, he can be accused of being an environmental fascist. If he does the latter, then he contradicts his own claims for the priority of the biotic community and is no longer the biocentric holist that he claims to be. The only way to recognize both community and human-rights values is to have second-order ethical principles and a priority ranking system that specifies the respective conditions under which holistic and individualistic ethical principles ought to be recognized. In the remainder of this essay, I shall sketch such a ranking system. It is a third position, a way of integrating holistic and individualistic ethics so as to safeguard basic human rights while recognizing environmental welfare.

Hierarchical Holism

We might call this integrated position "hierarchical holism" because it recognizes the plausibility of attributing inherent worth (therefore the status of moral patients) to systems and processes that are not sentient, yet it provides for a hierarchical or lexicographic ordering of various duties regarding humans, other beings, and environmental systems or processes. Several of the most prominent characteristics of this hierarchical holism are: (1) that it is based on a metaphysical rather than merely a scientific notion of the biotic community; (2) that it relies on an ethics that is both anthropocentric and biocentric; and (3) that it includes some second-order ethical principles capable of adjudicating conflicts among human versus nonhuman interests.

Because of all the ecological difficulties (already mentioned) with current scientific definitions of biotic wholes, their boundaries, and their processes, hierarchical holism relies on a metaphysical, not merely a scientific, account of biotic communities. As our earlier criticisms of Leopold's and Callicott's first-order environmental holism

reveal and as Arne Naess's criticisms of "ecologism" argue (Naess, 1989, pp. 26–27, 39–40, 130–33), there is no ecological conception of holism that is precise, predictive, and clear. Hence, our view of the biotic whole must be based on some metaphysical presuppositions about the value of various processes, systems, relationships, and species. Possibly ecologists are the best persons to make the metaphysical and value judgments about how to define this biotic whole; nevertheless, such judgments are based on expert opinion and values, not merely on scientific fact. As a consequence of such ecological judgments, hierarchical holism is not subject to the same scientific criticisms as Leopold's and Callicott's versions of holism discussed earlier.

Hierarchical holism also relies on partially anthropocentric accounts of ethical behavior because ecology is insufficiently precise and predictive regarding concepts such as equilibrium, homeostasis, stability, and community. Hence, we humans—given unavoidably human understanding of the natural world—must make our best guesses as to how to maintain some biotic health. Again, ecologists may be in the best position to offer opinions on this issue because of their professional expertise. The main point, however, is to "call a spade a spade": because of the problems with scientific or biocentric definitions of stability, our holistic ethics has a warrant which is metaphysical rather than purely ecological and which is unavoidably and partially anthropocentric rather than purely biocentric. As a consequence, our hierarchical holism, unlike other versions of holism, retains the full normative force of ethics.

In order to avoid the incoherence besetting the environmental ethics of all those who posit both holism and human rights but provide no clear and specific way to adjudicate conflicts, hierarchical holism provides some second-order principles. As a consequence, of course, it cannot postulate the "biotic equality" of ethicists such as Callicott or Paul Taylor (Taylor, 1986). Instead, it must establish principles specifying a hierarchy of duties, rights, and responsibilities. One possible second-order principle might be to give priority to strong human rights (such as the right to bodily security) over duties to any other environmental or biocentric goal, and to give priority to environmental and biocentric goals over weak human rights (such as rights to property). By following such second-order principles, we not only have a practical scheme for adjudicating environmental controversies, but also we have a rule that places the burden of proof on anyone who interferes with nature for any reason except to preserve strong human rights (Naess, 1989, pp. 26–27). There is no space here to defend the strong rights/weak rights framework, but Ronald Dworkin provides one possible justification (Shrader-Frechette and McCoy, 1993, chps. 6, 7, 9). Strong rights, on his scheme, are essential to human dignity and personhood; they are rights that can never be overridden. Weak rights are those that are not essential, that can be overridden if the common good demands it. One benefit of the strong rights/weak rights framework is that it allows us to avoid environmental fascism and to recognize the most basic human rights even though it calls for more stringent protection of the environment.

By giving priority to strong human rights over environmental welfare, and to environmental welfare over weak human rights, we appear to be following priorities that are similar to those of Naess and Sessions who argue that humans have no right to reduce the richness and diversity of the world except to satisfy vital human needs (Naess, 1989, ch. 1). Hence, our hierarchical holism appears consistent with deep

ecology, in at least some respects. For those who argue that we need a biotic equality, not a hierarchical environmental ethics, however, we can make several responses. First, Aristotle's basic intuition—that ethics requires us to treat equal beings equally—seems correct (Aristotle, 1973, pp. 1131a10–1131a30). Because humans are not equal to nonhumans as moral agents, or as free and responsible beings, or as having the capacity to suffer and be harmed, it is not obvious that they ought to be treated as equal moral patients. Moreover, treating all members of the biotic community equally is impossible, given the requirements for human food and shelter and the disturbance that accompanies meeting such requirements. Hence, in order to operationalize any environmental ethics, there are practical requirements for second-order principles; otherwise we would face the Scylla of environmental fascism or the Charybdis of being unable to adjudicate environmental controversies.

In addition to second-order principles there are, of course, a number of other important steps for converting hierarchical holism to a workable and practical environmental ethics that can be used as a basis for policymaking. One of the most important conditions for implementing hierarchical holism is that persons understand and accept a number of important principles of environmental education that illustrate the mutual interdependencies of the inhabitants of the planet (Palmer, 1992, pp. 181–186; Shrader-Frechette and McCoy, 1993, chp. 10). In the light of such interdependencies, it is obvious, for example, that protecting fish from dangerous pesticide runoff is essential also to protecting humans and vice versa. Understanding the necessity for sustainable agriculture and sustainable population growth is also a precondition for accepting the reforms entailed by implementing hierarchical holism (Harwood and the Committee, 1993). Environmental education thus is essential to implementing a new environmental ethics of hierarchical holism because without it, policymakers will face endless debates over coercive means of environmental management. Without education, presumably people would have no choice except for environmental management based on Garrett Hardin's principle: "mutual coercion mutually agreed upon" (Hardin, 1968, pp. 1243–1248).

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Section Six

Indigenous Groups

Although anthropologists debate the utility and meaning of the word "indigenous," the discipline has its origins in the study of small, usually marginalized groups. Researchers operating within a Stewardian tradition often focus on how relatively restricted groups of people relate to a circumscribed environment. The enduring appeal of this framework is evident, for example, in Haenn's writing (Section 4). However, as anthropological ideas about isolated communities have changed, anthropologists consider indigenous people and their environments as located in complex, multilayered social processes. Still, during disputes over land and natural resources, the word "indigenous" continues to hold power. As the authors describe, the precise importance of what it means to be indigenous in a given setting requires close examination.

This section continues earlier authors' discussions of how cultural orientations act as a lens through which people see the world. The authors in this section consider how people identified as indigenous often carry a burden of having their cultural perspectives romanticized or denigrated. Indigenous people are often depicted as either inherently inclined toward environmental protection or incapable of grasping how their actions might be environmentally detrimental. Rarely are indigenous peoples seen as normal human beings, with all the complexity that human existence entails. Disempowered indigenous groups may be unable to argue against how their images and resources are exploited. At the same time, through today's globalized media and institutions, some indigenous groups are finding new sources of empowerment though not always in ways that please environmentalists.

The section begins with Kay Milton's theorizing about the relevance of cultural diversity in environmental management. Additionally, Berkes et al. outline the qualities of common property management regimes, a tenure system closely identified with indigenous land management. Suzanna Sawyer reports on the implications for indigenous sovereignty of oil exploitation in Ecuador. In Ecuador, indigenous people have formed a potent political force, in part, because of their association with multinational environmental groups. J. Peter Brosius takes a closer look at these connections, questioning how ideas of "indigenous" get appropriated and transformed by environmental campaigns for rain forest protection. In this section's polemical piece, Will Anderson counters indigenous claims to whaling rights in the United States. Anderson opposed a request by the Micah group, to the International Whaling Commission, for permission to kill one whale for ritual purposes. Finally, this section's ethical reflection includes David Maybury-Lewis's thoughts on the continuing importance of indigenous identities. Maybury-Lewis is a member of Cultural Survival, a group that defends indigenous groups throughout the world.

Cultural Theory and Environmentalism

Kay Milton

The prime motivation for this book was the conviction that anthropology can benefit the environmentalist cause; that it can help us to identify our responsibilities for protecting the environment and work towards their fulfilment. Environmentalists have operated largely in ignorance of what anthropology has to offer. In particular, their understanding of the human-environment relationship has not been informed by a knowledge of how culture mediates this relationship, and the absence of this knowledge has seriously undermined the arguments presented in the global environmental debate. It is appropriate to end this exploration by considering how the study of culture can help environmentalists to a better understanding of human ecology and a more informed discourse on the search for sustainable ways of living.

Dispelling the Myths

One of the clearest messages that anthropologists can give to environmentalists is that human beings have no "natural" propensity for living sustainably with their environment. Primitive ecological wisdom is a myth, not only in the anthropological sense, as something whose truth is treated as a dogma, but also in the popular sense, as something that is untrue, a fantasy. The reasons why the myth persists are easy to understand. In some contexts it provides support for political arguments, against industrialism and its associated developments, and in favour of autonomy for indigenous and traditional communities. But perhaps the main reason for its persistence is that it gives environmentalists hope that there is a ready-made solution to environmental problems, albeit one that is very difficult to achieve. The myth implies that if industrial societies could "get back" to a more "natural" existence, by emulating the practices and cultural perspectives of non-industrial peoples, then our difficulties would be solved. The knowledge generated by the comparative analysis of human cultures indicates that this is not so.

Does this mean that the message anthropology brings to environmentalism is essentially pessimistic? Not necessarily, for the message is not that environmentally

benign cultures do not or cannot exist, but that identifying them is not as easy as pointing to non-industrial peoples. An understanding of cultural diversity can be a source of ecological wisdom, but nowhere is this wisdom ready-made. It has to come from a knowledge of the range of possibilities, and an understanding of how human cultures and the environments in which they develop impact upon each other. It may be possible to manufacture sustainable ways of living out of bits and pieces selected from diverse cultures, but it would be unwise to attempt this without first understanding them in their original contexts, and appreciating the consequences of taking them out of those contexts. The discussion in this book does not point to a clear way forward. Anthropology could not, in any case, do this on its own; hence the need for "multidisciplinary" approaches that include the physical as well as the social sciences. But the arguments and evidence presented here do indicate ways in which anthropological knowledge might inform environmental discourse.

First, and most important, the assumption that some cultures are more natural than others is a damaging distraction and should be abandoned. It fuels established prejudices, reinforcing the divisions that sustain discrimination and conflict. It also creates the misleading impression that creating a sustainable way of life is a matter of "going back", and this makes it harder to persuade many people of its value, particularly those who, in the minds of many environmentalists, most need to be persuaded: those who pursue the equally distracting ideal of "progress" in the form of economic growth. The alternative is to see nature as the all-encompassing scheme of things to which all human cultures and practices, as well as non-human species and physical processes, belong. In this view, a dam built by people is as natural as one built by beavers, computer technology is as natural as collecting fruit from the rainforest. There is no other nature to get back to. This is it—we are already there. This frees us to examine all human practices and cultural phenomena without prejudice. It enables us to consider their ecological value without assuming from the outset that some are "naturally" better than others.

Second, we need to be aware of the fundamental character of culture and therefore of cultural variation. It is not just a matter of different symbols with similar meanings, different ways of expressing the same things. Cultures can differ radically in the way they allocate power within the universe, the way they perceive or conceptualize time, the way they define humanity and the relationship between life and death. The acceptability of environmentalist arguments can depend on these variations. The concept of extinction is likely to be very differently received by those for whom cross-species reincarnation is an indisputable fact, than it is by western scientists. The idea of protecting the environment makes little sense to people who see it as their protector.

Third, and following from the previous point, we need to appreciate the way in which the different components of cultural perspectives are related to one another: how fundamental assumptions about the world relate to values, goals, norms and so on. These relationships again affect the extent to which environmentalist arguments can be accommodated. People's receptiveness to the idea of environmental protection depends on the relationship between their understanding of power, the way they allocate responsibility, both within human society and between human and non-human forces, the way they think about time and the extent to which they envisage and plan

for the future. These relationships also affect the extent to which cultural phenomena can be imported from one context into another. It might seem like a good idea for industrial societies to emulate the Dogon respect for trees, for instance. But this is not an isolated phenomenon; it is part of a cultural complex whose other components do not fit easily into an industrial context.

A great deal of knowledge which could provide environmentalists with a better understanding of human ecology is already present in the anthropological literature, though not always in a form that is accessible to non-anthropologists. One way of making this knowledge more available is for anthropologists to participate more fully in environmental discourse (cf. Rayner 1989). But moves can also be made by environmentalists. Efforts to introduce new conservation measures, to formulate new environmental policies and to change damaging practices are usually preceded by research to determine the nature of the problems and identify possible solutions. The arguments presented in this book are intended to communicate the message that problems and solutions are as much cultural as they are physical or biological, and that cultural research should be a part of the package.

Cultural Analysis and Global Discourse

The same principles and methods that are used to compare cultures and cultural perspectives, and to reveal their underlying assumptions and fundamental commitments, are also relevant for understanding what I have called "transcultural" discourses and perspectives, those generated by communication across cultural boundaries. Environmentalist discourse is clearly transcultural in this sense, as are the dominant perspectives that compete and overlap within it. The analysis is inconclusive on the question of which transcultural perspective, globalist or anti-globalist, anthropocentric or ecocentric, holds out the best prospect for an environmentally sustainable future. This is inevitable, since this kind of judgement depends on knowing what such a future might be, and this knowledge cannot come from anthropology alone. Again, this is why we need a mixture of disciplines. But cultural analysis reveals other things that have implications for global environmental discourse.

It reveals, for instance, that the diverse perspectives share a certain amount of common ground, that there is potential for agreement among globalists, anti-globalists and ecocentrists on some practical environmental measures, despite their fundamental disagreements on other things. It reveals that, while both globalists and anti-globalists claim to respect the cultures of non-industrial peoples, they differ in their commitment to this claim. The anti-globalists see this respect as central to the creation of a sustainable future, but in doing so they tie their arguments to a faith in the myth of primitive ecological wisdom, which anthropological knowledge exposes as untenable. The globalists, on the other hand, seek to impose an overarching hegemony which renders more or less worthless their claim to respect cultural diversity, and which reveals their understanding of culture to be particularly naïve and uninformed. It also calls into question their commitment to democratic principles.

Cultural diversity becomes particularly important when viewed in the context of observations made above. If no human culture holds the key to ecological wisdom, then it is essential to conserve the greatest possible number of ways of interacting with the environment if we are to maximize the chances of survival, both of our own species and of those with which we share the planet. To this extent, I agree with the anti-globalist view that protecting cultural diversity might offer the best chance of conserving biodiversity, though I would not accept the argument presented by some anti-globalists, that cultural diversity can guarantee the protection of biodiversity. Neither the anti-globalist nor the globalist perspective has identified the political circumstances in which cultural diversity can be effectively conserved.

That environmentalist arguments can be ill-founded and inconsistent is not itself a surprising revelation. Environmental discourse is essentially political, shaped by vested interests struggling to control the future, and shrouded, therefore, in a great deal of "expressive propaganda". In such contests, it matters more to be convincing than to conform to standards of truth and logic. But cultural analysis can demonstrate in what ways arguments are ill-founded and inconsistent. It can, in Douglas' words, "dispel the fog", by replacing a general cynicism towards, and suspicion of, political debate with a more precise understanding of why we should be unconvinced by some arguments and, perhaps, cautiously receptive to others. If participants in the discourse are willing to listen, then such understanding can only force environmentalist argument on to a franker plane.

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The Benefits of the Commons

F. Berkes, D. Feeny, B. J. McCay, and J. M. Acheson

It has become a truism that resources held in common are vulnerable to overexploitation. Twenty-one years ago, Hardin popularized this dilemma—calling it the "tragedy of the commons"—by the use of a metaphorical village common in which each herdsman "is locked into a system that compels him to increase his herd without limit"[1]. Hardin argued that such problems have no technical solutions, and emphasized the need for government controls to limit "freedom in the commons [which] brings ruin to all"[1]. Hardin and others[2] have subsequently pointed to privatization of common resources as another solution consistent with the analysis of many resource economists.[3]

It is usual to assume that resource degradation is inevitable unless common property is converted into private property or government regulations are instituted. The prevalence of this view is reflected by an article in *The Economist* of 10 December 1988 about fisheries, typically viewed as a common-property resource: "… it is possible to manage fisheries successfully", the author asserts, "provided three facts are kept in mind". Two of these are relevant here: "left to their own devices, fishermen will overexploit stocks" and "to avoid disaster, managers must have effective hegemony over them".

Nevertheless, research carried out in the 21 years since Hardin's article often leads to conclusions that challenge this conventional wisdom. Such results are of interest to resource managers, applied natural and social scientists, policy-makers, and development planners. Many case studies, including our own, show that success can be achieved in ways other than privatization or government control[4-7]. Communities dependent on common-property resources have adopted various institutional arrangements to manage those resources, with varying degrees of success in achieving sustainable use. We use ecological sustainability[8] as a rough index of management success without necessarily implying resource use that is ecologically or economically optimal.

As a first step in the analysis, it is necessary to define the kind of resources under consideration. Common-property (or common-pool[9]) resources share two key characteristics. First, these are resources for which exclusion (or control of access) of potential users is problematic. The physical nature of the resource is such that controlling

the access of potential users is costly and, in some cases, virtually impossible. Migratory or fugitive resources such as fish and wildlife pose obvious difficulties. Similarly, ground water, range and forest lands, and global commons[8] such as the high seas, the atmosphere, and the geosynchronous orbit, pose problems of exclusion.

The second key characteristic of common-property resources is subtractability; each user is capable of subtracting from the welfare of others. This characteristic creates a potential divergence between individual and collective economic rationality in joint use[3]. As one user continues to pump water from an aquifer, others experience increased pumping costs; as the number of fishing boats increases, the catch per unit of effort for each declines. On the basis of these two characteristics, we define common-property resources as a class of resources for which exclusion is difficult and joint use involves subtractability.

As a second step in the analysis, a taxonomy of property-rights regimes is needed[9–11]. Common-property resources are held in one of four basic property-rights regimes. (1) Open access is the absence of well-defined property rights. Access is free and open to all, as with ocean fisheries of the past century. This is the regime implied in Hardin's model. (2) Private property refers to the situation in which an individual or corporation has the right to exclude others from using the resource and to regulate its use. (3) Under communal property, the resource is held by an identifiable community of users who can exclude others and regulate use. Some shellfish beds, range lands, forests, irrigation and ground water have been managed as communal property. (4) State property or state governance means that rights to the resource are vested exclusively in government, which controls access and level of exploitation. Examples include crown lands and resources such as fish and wildlife held in public trust. These four categories are ideal, analytical types. In practice, resources are often held in overlapping combinations of these four regimes, and there is variation within each.

We now briefly summarize selected case studies. These studies show the workings of communal-property systems not recognized in Hardin's model, as well as the limitations to the use of state governance in some situations.

Our first case concerns wildlife hunting territories in James Bay, Quebec, in northeastern Canada[12]. Hunters in this subarctic area have traditionally used resources communally, as do many Amerindian groups, and have a rich heritage of customary laws to regulate hunting. Beaver is an important species both for food and, since the start of the fur trade in James Bay in 1670, for commerce.

The Beaver is vulnerable to depletion because colonies are easily spotted. A community-based hunting territory system, with senior hunters and their families acting as stewards of specific territories, at present ensures sustainable use. The beaver resource in James Bay, however, has not always been used sustainably. In the 1920s, a large influx of non-native trappers followed the new railroad into the area to take advantage of high fur prices. Amerindian communities lost control over their territories and all trappers, including natives, contributed to a "tragedy of the commons". Conservation laws were eventually enacted after 1930, when beaver populations were at an all-time low, and outsiders were banned from trapping in James Bay. Amerindian community and family territories were legally recognized and customary laws became enforceable, resulting in productive harvests after about 1950[12]. The experience of the

1920s and 1930s is not unique. Periods of cut-throat rivalry among fur companies had led to non-sustainable use of resources twice before: in the mid-1700s and in 1825–29. Gradually, however, local control was restored and stocks recovered[12].

Our second and third cases deal with lobster and fish management on the east coast of the United States[13,14] and show that communal territories exist even in societies that subscribe to the ideal of freedom in the commons. In the US tradition, marine resources belong to all citizens but are controlled by state governments as a public trust. Privatization of some marine resources such as shellfish beds is feasible but not always socially desirable or politically acceptable[15]. Government management is similarly difficult: limiting the number of licences is considered an infringement of citizens' rights. Even so some groups of users are able to restrict access and manage common-property resources.

The lobster resource is vulnerable to overharvesting, but lobster stocks in Maine have remained sustainable. Although some managers have for decades been predicting a resource collapse, the Maine lobster catch has been remarkably stable since 1947[13]. The state government establishes lobstering regulations but does not limit the number of licences. In practice, however, there is exclusion through a system of traditional fishing rights; to go lobster fishing at all, one has to be accepted by the community. Once accepted, a lobsterman is only allowed to fish in the territory held by that community. Interlopers are usually discouraged by surreptitious violence.

One cannot say if the resource could have been used sustainably in the absence of such locally enforced exclusion and regulation. But we have compared the productivity of exclusively used territories with areas in which claims of adjacent communities overlap. We found that fishermen in the exclusive territories catch significantly more and larger lobsters with less overall effort[13].

The third case, a trawl fishery in the New York Bight region, provides an alternative community-based solution to the commons dilemma[14]. The fishermen who belong to a cooperative specialize in the harvest of whiting. They have ready access to the best whiting grounds in the region, and often dominate the regional whiting market in the winter months.

The cooperative maintains relatively high prices for members through supply management; it limits entry into the local fishery and establishes catch quotas among members. Limited entry is achieved through a closed membership policy and the control of docking space, effectively excluding non-members from access to whiting grounds and markets. Quotas are based on the estimates of what the cooperative can sell to the regional market, and are achieved in ways that reward individual initiative but also discourage 'free-riding'. By contrast with government-imposed regulations, which are considered by fishermen to be inflexible and which in any case are ineffective because they do not address the fundamental problem of access, self-regulation through the cooperative is considered to be both flexible and effective in maintaining sustainable use[14].

Forests in Thailand comprise our fourth case[16]. Traditionally the exploitation of high-value timber was regulated by local governments; the use of low-value timber was essentially unregulated. The rapid commercial exploitation of teak in Thailand in the late nineteenth century led to the nationalization of all forests. State ownership

fails to provide consistent enforcement, but it also serves to deny users the authority to manage local forests. Illegal logging, followed by further land clearing for cultivation, is widespread. Although much of this land is suitable for cultivation, there are few safeguards for conserving environmentally sensitive areas; this results in overall damage to land.

The lack of enforcement of state-forest property rights leading to accelerated degradation is not unique to Thailand. The nationalization of forests in Nepal (1957) and Niger (1935) produced a similar outcome[17]. In Nepal, the situation is being ameliorated by the re-creation of communal management at the local level[18]. Without effective control by government, nationalization has often converted traditional communal property into *de jure* state property but *de facto* open-access.

Having reviewed a few cases, we return to the tragedy of the commons model to explore its problems in relation to the findings. Hardin asks the reader to assume a pasture "open to all". Each herdsman acts in an individually rational fashion by adding animals to the common pasture. For him, the private benefits of adding one more animal exceed the private cost. Because each herdsman does the same, the overall result is overgrazing and disastrous losses for all.

Hardin's model provides insight about the divergence between individual and collective rationality. But it fails to take into account the self-regulating capabilities of users. It assumes that the herdsmen are unable to limit access or institute rules to regulate use. Therefore, overexploitation is inevitable—unless privatization or government controls are imposed. These conclusions have been used as part of the justification for nationalization[18], privatization of land resources[19], and the widespread practice of top-down development planning that ignores local institutions[4,6]. The social and ecological costs of these practices have often been tragic in their own right.

Recognition that users have the potential and, under some conditions, the motives and means to act collectively opens up other policy alternatives and provides questions about why some communal management systems fail and others succeed. The success or failure of common-property resource management has to do with the exclusion and regulation of joint use. Forest destruction in Thailand, for example, occurs because villagers do not own the forest and cannot exclude others. Local people therefore have little incentive to conserve and every incentive to cut down trees before someone else does[16].

By contrast, in other examples—hunters in James Bay, lobstermen in Maine, trawlermen in the New York Bight area, communal forest users in Nepal, and irrigation water users in South India[20]—groups are able to exclude other potential users and regulate their own joint use. They are therefore able to reap the benefits of their own restraint. Our examples are not isolated, but are consistent with a large body of literature on grazing lands[21], forests[22], water[23], and coastal marine resources[24], covering a wide range of regions and cultures throughout the world.

What accounts for the many exceptions to the predictions of the conventional theory? How can Hardin's model be improved to obtain a more comprehensive theory of common-property resource management? First, the Hardin model confuses common-property resources with open access—the absence of property rights. By equating common-property resources with open access, and then assuming that open

access leads to overexploitation, the model falls into the trap of equating the commons with overexploitation.

Second, the model assumes that the individual interest is unconstrained by existing institutional arrangements. In many communities, common-property resource users are compelled by social pressure to conform to carefully prescribed and enforced rules of conduct.

Third, the model assumes that resource users cannot cooperate toward their common interests. This is not necessarily so; under certain circumstances, voluntary collective action is feasible[25], and sustainable outcomes are not unusual[4–7, 20–24].

More fundamentally, the model overlooks the role of institutions that provide for exclusion and regulation of use. Cultural and historical factors underlying such institutional arrangements are a key to the success of communal management of coastal marine resources in Japan and several Pacific-island nations[24], in addition to the cases we describe above.

Finally, the set of solutions offered by the model is too limited. Privatization or the imposition of government control are not the only viable policy options. In fact, the conventional reliance on these approaches is overly sanguine. By definition, common-property resources are ones for which exclusion is difficult and so privatization is often not feasible. Although dividing a commons and assigning individual property rights can increase efficiency under some circumstances, it might not in others. Similarly, state control has worked in some cases, but the example of Thailand forests illustrates its potential for failure.

In general, we propose that successful approaches to the commons dilemma are found in complementary and compatible relationships between the resource, the technology for its exploitation, the property-rights regime, and the larger set of institutional arrangements. We also propose that combinations of property-rights regimes may in many cases work better than any single regime. The success of local-level management, for example, often depends on its legitimization by central government; James Bay[12] and recent experience in Nepal[18] are examples. Such nested relationships are also found in fisheries in Japan and Oceania[24]. In some cases, cooperative management arrangements (co-management) are needed, involving the sharing of power between governments and local communities[26].

In sum, sustainable common-property resource management is not intrinsically associated with any particular property-rights regime. Successes and failures are found in private, state and communal-property systems. Recent research highlights the potential viability and continued relevance of communal-property regimes, nested systems and co-management. Studies after that of Hardin have shown the dangers of trying to explain resource use in complex socio-ecological systems with simple deterministic models.

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Indigenous Initiatives and Petroleum Politics in the Ecuadorian Amazon

Suzana Sawyer

"We don't want 'la compañía' to dirty our rivers, destroy our forests and divide our people. We oppose the so-called petroleum 'development' that has poisoned communities to the north and demand recognition as indigenous nationalities, as a people whose ancestral territory is one."

—Marta Gualinga. Quichua female leader speaking at the Villano Assembly, December 16, 1993

Along with 250 other lowland Indians, Marta Gualinga trekked through the rainforest for three days before reaching Villano—the site of ARCO's exploratory wells. Lowland Quichua representing 133 indigenous communities throughout Ecuador's central Amazonian province of Pastaza gathered for an assembly called by OPIP (Organization of Indigenous Peoples of Pastaza). For three days in mid-December 1993 participants debated oil exploration and imminent production in Indian lands. Young men with starkly painted torsos and faces angrily denounced ARCO; more experienced leaders cautiously measured alternatives. Petroleum "development" had indelibly transformed the northern Ecuadorian Amazon where scant industrial restrictions over the past 25 years caused significant social and environmental degradation. As hydrocarbon operations moved south, OPIP-affiliated communities weighed how best to prevent similar effects in their lands.

The Villano Assembly launched OPIP's "Campaña Tungui"—invoking the drum rhythm which called allied groups to war centuries ago. The campaign outlined the conditions under which ARCO might proceed with its activities in Indian lands and declared a 15-year moratorium on further petroleum activity in the province. OPIP pressed for indigenous participation in environmental and social planning and monitoring, as well as the economic benefits of ARCO oil operations. Héctor Villamil, OPIP's president, rallied under the corrugated tin roof of a one-room school, "this

assembly affirms our democratic zeal, for participation is precisely what we demand. We denounce current petroleum politics and insist that ARCO respect the territories of the indigenous peoples of Pastaza." A helicopter transporting drilling mud to ARCO's well flew over head.

In a pattern repeated wherever oil operates in Ecuador, the local community was divided. A handful of families loyal to OPIP invited Assembly participants to Villano. Yet a larger group materially supported by ARCO vehemently criticized the assembly and threatened participants. Indigenous opposition introduced risk to continued hydrocarbon activity. Tensions rose as OPIP leaders obstinately asserted their rights to convene in the area and overly zealous young men boasted of occupying ARCO wells, now militarized with seventy counter-insurgency troops. Villano encapsulated the political-economic reality animating petroleum development throughout the Oriente: state dependency on oil, unmitigated military protection, multinational carte blanche, and local factionalism. Despite the power of corporate economic interests and indigenous peoples' circumscribed structural position, however, the Villano Assembly spurred into motion a process which ultimately conditioned—for the first time in Ecuador's seventy-year history of oil exploration—serious dialogue between indigenous peoples and a multinational over petroleum activity in Indian lands. OPIP leadership and community members began to re-articulate the relations between multinationals and local communities and influence the particular pattern of resource extraction in their territory.

The Crude Challenge

In 1967, Ecuador launched itself into the industrial world with Texaco's discovery of a sizable oil reserve in the northern Oriente (as the Ecuadorian Amazon is called). Rainforest lands, previously seen as "empty," "barren" and awaiting colonization, became the source of Ecuador's black gold and the key to national modernization. In 1973, under the newly established military regime. Ecuador joined OPEC, and petroleum became a national security concern. With the influx of new petro-dollars and swollen aspirations to develop the country, the small Andean state became woefully dependent on petroleum. Today, oil revenues account for 50% of the national budget. All major petroleum reserves reside in the Oriente; transformations have been most acute in the northern lowland provinces of Napo and Sucumbios. There the exploitation of large oil fields has inscribed rainforest landscapes with seismic grids, over three hundred productive wells, more than six hundred open waste pits, numerous pumping stations, an oil refinery and the bare-bones infrastructure essential for petroleum operations. A network of roads links oil towns and parallels the pipeline for 500 km across the Andes to the Pacific. For the most part, oil companies have bought off local communities to facilitate the smooth flowing of their operations.

The negative repercussions of petroleum exploration and extraction are slowly becoming documented. In her comprehensive study of Texaco's 25 years of operation, Judith Kimerling calculates that since production began in 1972, Ecuador's trans-Andean pipeline has spilled an estimated 16.8 million gallons of crude—one and a

half times that spilled by the Exxon Valdez. Likewise, petroleum operations discharge 4.3 million gallons of toxic waste daily. Recent studies document an increase in skin and intestinal disease, headaches and fevers among local inhabitants, and contaminants in drinking water which reached levels 1,000 times the safety standards recommended by the U.S. EPA. Despite public protest by Indians, colonists and environmental activists, President Sixto Durán Ballén initiated a formidable campaign to expand production. In 1992, Ecuador withdrew from OPEC in order to produce in excess of the cartel's quotas. All signs indicate that hydrocarbon activity will only intensify.

Consolidating the Commons

Pastaza Province stretches from the central Andes eastward to the Peruvian border, covering 30,000 sq. km. Along the western-most portion, a 30 km-wide plateau flanks the foothills. Here, thirty years of colonization has transformed once forested indigenous land into a patchwork of pasture and agriculture. A network of roads connects smaller hamlets and colonist parcels to the provincial capitol, Puyo. Down the escarpment bordering the plateau's eastern rim, indigenous claimed territory begins—two million hectares of dense, yet managed, rainforest. The terrain is rugged, cut through with numerous river basins by the more than four meters of annual rainfall. Except for one 8km dirt road completed in 1993, there are no vehicular routes into the region. The indigenous populations living in the area inhabit dispersed settlements; the larger built around missions, schools and health dispensaries. Agriculture is largely subsistence with increasing production and harvest for market. This scenario markedly differs from the social and political-economic reality of the provinces directly to the north.

OPIP officially formed in 1978 as state pressure to colonize and develop Pastaza led to greater indigenous displacement. The Indian federation denounced state modernization strategies as destructive of cultural and ecological systems. Gaining communal title to Indian territory was the first step in asserting control over the processes negatively affecting indigenous livelihoods. Through the 1980s, OPIP actions halted colonization at the plateau and curtailed further incursions onto indigenous lands. It was not until 1992, however, when 2,000 Pastaza Indians marched to Quito demanding communal land rights, that indigenous peoples acquired legal title to over one million hectares of their territory. "The March" gained unprecedented popular support throughout Ecuador and signaled a sophisticated indigenous politics of resource use and territorial control. Significantly, it further crystallized the formation of an ethnic-national identity in the region, where livelihood forest management practices inform visions of resource use and social justice in the rainforest.

Yet, while land title precluded the further colonization of Indian lands, it provided no legal control over petroleum activities within them. Indians gained surface rights. Subterranean resources, of which petroleum is the most coveted, belong to the state which retains the right to develop them as it deems necessary. In 1988, ARCO acquired rights to explore an oil concession located in eventually adjudicated Quichua territory in Pastaza. In 1989, Quichua actions paralyzed ARCO exploration for one year. OPIP communities opposed to hydrocarbon activity charged that dynamite detonated

during seismic exploration destroyed agriculture, scared away animals and killed fish. Operations resumed in 1990, however, allowing ARCO to identify pro-oil communities in the interim. In 1992, the company publicly announced its discovery of the province's first productive oil field. As it became increasingly evident that OPIP could not stop oil operations in Pastaza, the federation focused on how best to influence its development.

From OPIP's perspective, all attempts to negotiate with ARCO had decisively failed, despite moments of promise. ARCO refused to recognize OPIP as the legitimate representative body of indigenous inhabitants of the region. Instead, the multinational recognized and materially supported the pro-oil indigenous group that claimed to represent the three communities near the Villano wells. OPIP leaders interpreted ARCO's choice to legitimate a local "organization" newly formed in the summer of 1993 as an affront to their integrity and fifteen-year struggle to consolidate an indigenous politic. ARCO argued that the company felt compelled to support the communities closest to and most directly impacted by their operations. Yet, multinational representatives dismissed the fact that their presence spurred the emergence and continued existence of an anti-OPIP entity; corporate operations both facilitated and profited from dividing indigenous loyalties.

Beyond launching the Campaña Tungui, the Villano Assembly sought to demonstrate through practice how indigenous people envision their territory. Importantly, Indians spoke of *territorio* ("territory") or *tierras* ("lands"—in plural). This terminology reflects an understanding of landscape and property distinct from that of the state, where *tierra* ("land") refers to a commoditized, individualized, alienable object. *Territorio* ("territory"), by contrast, refers to ancestral space, the site of historically belonging within a lived landscape. More than simply connoting the physical contours of a region, *territorio* encompasses moral-cosmological and political-economic complexes which shape social relations with it. Forest management and resource use regimes reciprocally sustain these relations. Indigenous territory "belongs" to no one individual, as with free hold, who independently controls it. Rather, territory belongs to everyone; decision over processes affecting multiple inhabitants would have to be debated by all. Consequently, Indians espousing OPIP politics had just as much right to determine what was to occur in their lands as individuals who supported ARCO's presence in Villano. "The people near the oil wells do not own this land," explained Leonardo Viteri, the director of Amazanga (OPIP's research institute), during debate at Villano. "Nor does petroleum simply affect one community. ARCO's [concession] is 200,000 hectares; we all manage this land and will all be affected by oil." While concerns of those living near oil wells might take special consideration, proximity in and of itself granted no special rights. According to OPIP, a group of pro-production individuals lacked the authority to decide the future of petroleum activity in Indian lands. OPIP-affiliated communities gather in Villano to demonstrate that point.

Cultivating Coalitions

Yet, dialogue between a multinational oil company and an Indian federation grew out of a broader trajectory of strategic coalition building between indigenous and

environmental groups. In 1990, Acción Ecológica (Ecuador's most consistently programmatic environmental group) launched its "Amazon for Life" campaign, a watch-dog effort to denounce, document and redress the environmentally and socially degrading effects of oil development in the northern Oriente. Over the following years, Acción Ecológica and indigenous groups coordinated specific target actions with key support from U.S. and European environmental and human rights groups (especially Oxfam America and the Rainforest Action Network). Through an elaborate transnational network, Indian federations and Acción Ecológica heightened national and international scrutiny of multinationals operations in Ecuador. Momentum snowballed in November 1993, when indigenous and non-indigenous inhabitants of the northern Oriente filed a $1.5 billion class-action lawsuit against Texaco in U.S. federal courts. Plaintiffs charged that the company's deliberate use of substandard technology to maximize profit in Ecuador over 25 years resulted in the massive contamination of the northern Oriente. Given the money involved and the press received, the suit and popular actions have alerted foreign companies that ignoring indigenous and ecological concerns has consequences.

One month after the Villano Assembly, OPIP members in coordination with CONAIE (Confederation of Indigenous Nationalities of Ecuador), CONFENIAE (Confederation of Indigenous Nationalities of the Ecuadorian Amazon) and Acción Ecológica occupied the Quito offices of the Minister of Energy and Mines. Their action fell on January 24th, 1994, the day the Ecuadorian government opened bidding for nine new oil concessions in the Oriente; four of the nine were located in Pastaza. Fifteen individuals positioned themselves inside the Ministerial quarters, refusing passage until the Minister agreed to discuss their concerns. Outside, approximately 150 protesters formed a human chain, impeding all traffic in and out of the building. In the city park across the way, demonstrators pitched tents and strung protest banners, symbolizing their resoluteness. As Luis Macas, the president of CONAIE, asserted, the occupation was in protest of the state's "incoherent petroleum policy" which "is contemptuous of indigenous peoples and provokes social, cultural and environmental conflicts." Protesters' politics were encapsulated in the broad green letters of a banner suspended between trees: "The Defense of Nature and Social Justice are Inseparable."

After a five-hour stand-off, the Minister met with protesters. Despite threats, the police were never called; keen on attracting foreign investors, the government did not wish to call attention to popular protest. Among the five demands presented to the Minister was the need for transparent and direct negotiations between ARCO and OPIP. The following morning, the Minister personally oversaw a meeting between ARCO and OPIP, clarifying the multinational's responsibility to engage in dialogue with the federation. While short of a Ministerial mandate, this meeting led haltingly to the eventual formation of a fragile, tripartite commission in September 1994 to design and monitor petroleum development in the Pastaza. Significantly, the commission includes representatives of an indigenous front of OPIP and anti-OPIP/pro-production groups, ARCO and the state petroleum company. Important changes from the prior pattern of oil exploitation discussed include: no road construction into indigenous territory; directional drilling allowing for multiple wells to radiate off one perforation; and containment of industrial chemicals, muds and solvents. Final

outcomes of dialogues to mitigate negative social and cultural consequences of oil work are still pending.

Dialogue is still in its early stages. To date, ARCO and the state have not finalized details for the construction of a pipeline carrying crude to Pacific ports. Until that point, the company reasons it is unable to make future commitment with indigenous groups. ARCO has agreed, however, to finance an environmental impact study of the exploratory phase of their work. While a standard procedure in the U.S., an environmental impact study of their operations to date is not legally required under Ecuadorian law. This step is significant, theoretically, as an evaluation of the social impact of ARCO operations must accompany analysis of environmental effects. Yet more significantly, OPIP succeeded in insisting that their communal lands be treated as indivisible territory; all Indians, not simply a small group near ARCO wells, must debate oil operations. Dialogue represents the recognition of the commons—the fact that local resource-use and access regimes differently structure decision-making processes over activity within a landscape. While an incomplete and unpredictable process. OPIP's struggle against environmental injustice and for participatory engagement is slowly controlling the processes affecting indigenous livelihood and territory, setting precedence in Ecuador and for the Amazon region.

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Endangered Forest, Endangered People
Environmentalist Representations of Indigenous Knowledge

J. Peter Brosius

> Dawat took a deep breath and came wondrously alive. His eyes and arms almost danced as he made an impassioned plea for his forest and his people. For nearly an hour the power of the forest spoke through him, and when he ended there was an abrupt silence. For a few moments all of us sat quietly as the jungle sounds of distant birds and drumming cicadas filled the air. Although the details of what he said came only several months later when the interview was translated, we all sensed in our hearts that we had heard something both poetic and profound. (Henley, 1990, p. 94)[1]

Introduction

In the early 1980s, timber companies in the Malaysian state of Sarawak, on the island of Borneo, began moving into interior upland areas inhabited by various groups of Penan hunter-gatherers. In 1987, the Penan began to actively resist these incursions by establishing a series of blockades. Since that time the Penan have become the focus of a broad-based international environmental campaign to assert their land rights and preserve the Sarawak rainforest. This campaign has been very high profile indeed, covered widely in the media, and supported by numerous political figures and celebrities.[2] Environmental organizations in the U.S., Canada, Japan, Australia, England, Germany, Switzerland, Austria, Sweden, Denmark, the Netherlands, Belgium, and elsewhere have been involved in various aspects of the Sarawak campaign. What is perhaps most remarkable about this campaign is that it is not the product of central coordination, but instead developed almost spontaneously as the situation of the Penan became more widely publicized.[3] In a series of interviews I conducted with European and American environmentalists, Penan resistance to logging was repeatedly

cited as an exemplar of how indigenous peoples can assert control over their own destinies and, in the process, halt the loss of global biodiversity. In short, the Penan have become icons of resistance for environmentalists worldwide.[4]

In the present discussion I consider the rhetoric of this campaign. In particular, I examine the ways in which Western environmentalists have constructed Penan land rights with reference to Penan knowledge of the landscape and of the biotic elements which exist there. Further, I consider how environmentalists have drawn on ethnographic accounts in the process of constructing or describing certain domains of indigenous knowledge, and how those accounts are transformed in the process of generating images deployed in the campaign. I focus on one text in particular, a book entitled *Penan: Voice for the Borneo Rainforest* by ethnobotanist Wade Davis and environmental activist Thom Henley (Davis and Henley, 1990b).[5] Through focusing on the work of Davis and Henley, and to a lesser extent on other works by Davis (Davis, 1992, 1993), this discussion applies to environmental and indigenous rights rhetoric more broadly: the Penan case is but one instance of a more general discourse.[6]

The Penan, Blockades and the Growth of the International Campaign

The Penan of Sarawak are divided into two distinct populations, the Eastern and Western Penan (Needham, 1972, p. 177).[7] The Eastern Penan comprise all those groups living to the north and east of the Baram river, as well as in the upper Limbang watershed. The Western Penan include all those in the Belaga District, as well as communities in the Silat River watershed and at Leng Beku. Though in broad outline the forest adaptations of Eastern and Western Penan are similar, there are significant differences between these two groups with regard to subsistence technology, settlement patterns, social organization, and in the tenor of social relationships (see Brosius, 1990, 1991a, 1992, 1993a; Needham, 1972). Western Penan communities are characterized by long-term stability and a strong sense of internal cohesion. Eastern Penan bands, on the other hand, are much more fluid with respect to composition and much more ephemeral with respect to long-term historical identity. Western Penan communities tend to be much larger than those of Eastern Penan, with 60 to 200 members.[8] Eastern Penan communities average only 20–40 members. Western Penan bands occupy much larger foraging areas than do Eastern Penan, on the order of 1500 km^2, as opposed to 400 km^2 for Eastern Penan. Both Eastern and Western Penan conceive of their territories as a shared corporate estate over which all members of a community have rights.

Logging has a dramatic effect on the lives of Penan, both nomadic and settled.[9] The most immediate effect is on the forest resources upon which they depend for subsistence and trade. Sago palms (*Eugeissona utilis*) are uprooted by bulldozers, fruit trees are felled and rattan destroyed, and severe river siltation occurs. It is this situation and the blockades that have resulted from it that have attracted worldwide media attention.

Almost without exception, all the communities that have resisted logging with blockades have been Eastern Penan. Western Penan, by comparison, have been

conspicuously acquiescent to the activities of logging companies. The reasons for this contrast are complex and derive from a mix of political, historical, and social factors. One such factor has been that the Baram and Limbang Districts—those areas occupied by Eastern Penan—have been visited by numerous Malaysian and Western environmental activists.

This began in 1982 when the Malaysian environmental organization *Sahabat Alam Malaysia* (SAM, *Friends of the Earth Malaysia*) set up a field office in the upriver town of Marudi. Then, in 1984, Swiss artist Bruno Manser took up residence with a group of nomadic Eastern Penan in the upper Tutoh River area. He remained among various nomadic groups for over 6 years. It is Manser, along with *Sahabat Alam Malaysia*, who is most responsible for bringing the situation of the Penan to world attention. Beginning in 1985, Manser began sending letters out to a range of environmental organizations, and it was not long before reporters, filmmakers and environmentalists began to seek him out in the forest. As Manser was making their situation known outside of Sarawak, he was simultaneously acting as an instrument of encouragement for the normally retiring Eastern Penan to resist. Manser traveled widely throughout the Baram and Limbang areas and arranged large meetings which were attended by representatives from numerous communities. Along with SAM, Manser provided Penan the opportunity to internationalize their cause.

It was after striking images of the Penan blockades began to circulate in 1987 that the Penan began to become more well-known and a concerted international campaign began to be waged, both by Manser and by SAM.[10] The first Penan blockades were established not long after the founding of the Rainforest Action Network, which highlighted the plight of the Penan in its earliest campaigns. Numerous other rainforest groups were also forming in Europe, the United Kingdom, Australia, and Japan, in response to a more general awareness of the scale of tropical deforestation.[11] The Penan became iconic of forest destruction for many of these organizations.

Associated with the acceleration of the international Sarawak campaign were efforts by numerous individual environmentalists to visit Eastern Penan in order to gain first-hand information on their situation and document it for international distribution. A number of Western environmentalists managed to sneak into what had become a closed security zone. In their visits to Penan communities, these individuals frequently told Penan of efforts made on their behalf in Europe, Australia, and the U.S. Their mere presence (and in many cases it was indeed merely a presence, since Penan describe numerous visits by persons with whom they were unable to communicate) confirmed for the Penan the legitimacy of their cause.

Davis and Henley were two such visitors. Henley traveled to Sarawak twice in 1989 in order to visit Penan. It was on his second visit that he was joined by Davis. Davis and Henley stayed with both settled Eastern Penan living in the vicinity of Long Bangan, Long Iman, and Batu Bungan, as well as with nomadic Penan in the Ubung River. During this visit, Davis collected information on medicinal plants, and it was his wish to conduct further ethnobotanical research. This proved impossible because of the tense political situation in the area. In early 1993, Davis traveled to Sarawak again with a screenwriter from Warner Brothers in conjunction with plans to produce a film telling the story of Bruno Manser. On the basis of these brief trips, Davis and

Henley published a series of items on the Penan (Davis, 1992, 1993; Davis and Henley, 1990b). In each of these accounts there is a considerable degree of textual overlap.[12]

The Representation of Penan Knowledge: Resource Management, Landscape, and Medicinal Plants

In examining environmentalist discourse on the significance of indigenous knowledge it is necessary to consider precisely what is meant by the word *knowledge* itself. In fact, we can identify two rather distinct conceptions of indigenous knowledge: one which we might term the objectivist conception, and one the environmentalist conception.

As it is used by ethnoecologists, the word *knowledge* is generally applied to discussions of indigenous understandings of the natural world: systems of classification, how various societies cognize or interpret natural processes, what such groups know about the resources they exploit, and so forth. Brush has suggested that the forms that the study of indigenous knowledge has taken have changed considerably, and that four distinct, historically-situated approaches can be discerned: descriptive historical particularism, cultural ecology, cognitive anthropology, and human ecology (Brush, 1993, p. 658). Each of these presupposes a different set of starting assumptions regarding the nature of indigenous knowledge, and the purposes and epistemological bases for studying it. Central to the latter two approaches in particular has been a concern with the structural or systemic nature of indigenous knowledge (ibid, p. 658) and its utilitarian or adaptive significance (ibid, p. 659). Such is the objectivist notion of knowledge.

Brush also describes how, after 1980, addition of the word "indigenous" produced a more politicized discourse concerned with the issue of rights, and which has culminated in contemporary controversies over indigenous intellectual property rights (ibid, pp. 659–660).[13] Politicized though it was (and is), the discourse of indigenous intellectual property rights has adhered strongly to the objectivist conception of knowledge. This is necessary given the goal of defining indigenous knowledge as an entity subject to statutory recognition and framed with reference to metropolitan forms of legal textualization.

In certain other forms of environmentalist discourse, on the other hand, *knowledge* is transformed into something quite different. My purpose here is to focus on the nature of that transformation by examining what it is that writers such as Davis and Henley have defined and represented to their audience as "indigenous knowledge."

In order to understand how this transformation occurs, it is necessary first to recognize the sources from which such representations of indigenous knowledge emerge. For the most part, they derive from two sources. First, environmentalist representations of indigenous people and the landscapes they inhabit are often based on travel to those areas by activists, generally for periods of weeks or months. Such individuals often lack knowledge of local languages and are thus not able to communicate effectively with indigenous peoples. They are nevertheless able to document current conditions and, perhaps with the help of a translator, to record local perceptions and concerns and collect accounts of abuses by government authorities.[14] Second,

environmentalists frequently draw upon available ethnographic information in order to enrich their accounts and lend them an aura of authority. In point of fact, environmentalist texts seem very often to result from a combination of personal and ethnographic accounts, producing a textual interweaving of personal travel narrative and ethnographic minutiae. This is the strategy employed by Davis and Henley.

Such texts and images, once produced, are dispatched. The course they may take thereafter is quite variable: they may go through numerous transformations as they are repeatedly produced, reproduced, and at last distributed to a larger audience through networks such as the Internet and Econet, through faxes, through documentaries picked up by television networks, by fundraising letters, and in books such as that by Davis and Henley.[15]

These are not texts or images produced for mere aesthetic appreciation. They are deployed to make an argument and mobilize support, and intended to empower those they represent. They are, in short, tools of persuasion: they may be asking us to write letters, to send money, or to provide some other form of support. In order to serve as such tools of persuasion, they must *present* the Penan (or the Kayapo, or the Asmat) in ways that make us care and want to do something. They must also connect them to that other thing that is endangered: the forest.

There are any number of ways to achieve these ends. Arguments have been made about the value of the rainforest in terms of global warming, the preservation of biodiversity, and the potential for discovering new medicines. This is still evolving: new arguments continually emerge. Perhaps the most prevalent argument, and the one in which the most direct linkage is made between the fate of forests and peoples, is to assert the importance of indigenous knowledge for preserving biodiversity and to raise the specter of its loss. According to activist Alan Durning, indigenous peoples:

> … possess, in their ecological knowledge, an asset of incalculable value: a map to the biological diversity of the earth on which all life depends. Encoded in indigenous languages, customs, and practices may be as much understanding of nature as is stored in the libraries of modern science. (Durning, 1992, p. 7)

A second strategy is to link indigenous knowledge to the sacred or ineffable, partaking of a semantic shift that transforms "knowledge" into wisdom, spiritual insight, or some other such quality. This sort of shift is evident in a 1991 *Time* magazine cover story entitled "Lost Tribes, Lost Knowledge" (Linden, 1991). The subtitle of this story is "When native cultures disappear, so does a trove of scientific and medical wisdom." According to Linden:

> The prevailing attitude has been that Western science … has little to learn from tribal knowledge. The developed world's disastrous mismanagement of the environment has somewhat humbled this arrogance, however, and some scientists are beginning to recognize that the world is losing an enormous amount of basic research as indigenous peoples lose their culture and traditions. Scientists may someday be struggling to reconstruct this body of wisdom to secure the developed world's future. (ibid, p. 48)

Both of these valorizing strategies—one linking indigenous knowledge to the preservation of biodiversity, the other transforming "knowledge" into "wisdom"—require

the deployment of a discourse that places indigenous knowledge at its center. It is the latter transformation in particular that I examine here.

In the following discussion, I provide several examples of the transformation that occurs as ethnographic texts are transformed into environmentalist texts, and how in the process the substantive properties of indigenous knowledge are also transformed. In doing so, I focus on three examples: (1) Penan resource management, particularly as it applies to the *molong* concept, (2) knowledge of the landscape, and (3) the rhetoric of medicinal plants. I focus on these topics because, except in the case of medicinal plants, I myself first documented much of this and published it in a number of articles (Brosius, 1986, 1988, 1990, 1991a,b). This material was subsequently picked up and elaborated on by environmentalists, Davis and Henley among them, and incorporated into campaign materials. With respect to the case of medicinal plants, I provide this example because it illustrates the kind of rhetorical traffic that occurs when indigenous peoples themselves adopt and deploy transnational environmental rhetoric.

Resource Management and the *Molong* Concept

Sago, derived from the palm species *Eugeissona utilis*, is the carbohydrate staple of both Eastern and Western Penan. The factor which more than any other determines the nature of their distinctive settlement systems—the location of camps and the frequency and distance of movement—is the availability of sago. Penan have a clear idea of the relative abundance and location of sago groves throughout their foraging areas and locate themselves in proximity to sago concentrations. Rather than simply harvesting *Eugeissona*, Penan exploit it in a manner which maintains its long-term availability.

I first described the principles underlying Western Penan resource use in a 1986 article in the *Sarawak Museum Journal* entitled *River, Forest and Mountain: The Penan Gang Landscape* (Brosius, 1986). When I first wrote about these principles, in particular the *molong* concept, they had not yet been described. My primary purpose in writing this article—at a time when an increasing number of Penan communities were being dispossessed by the activities of logging companies—was to demonstrate that they did not wander aimlessly through the forest as was supposed by so many government authorities, but rather had well-established principles of land tenure and a sophisticated system of resource management. I deliberately published this article in a local journal so that it would be available to civil servants and government officials in Sarawak.

In this article, I described Penan conceptions of landscape, particularly with respect to the role that rivers play in organizing landscape knowledge. I also described the significance of trees, and it was in this context that I first described the *molong* concept:

> … the Penan landscape is filled with particular trees which are either the property of the whole community or which are recognized as belonging to specific individuals. Of significance here is the concept of *molong*, to preserve.[16] This generally applies to fruit trees of various types, to sago clumps, or, for instance, to large trees which are suitable for boat building. Frequently when traveling in the forest a person will spot a tree which has

not been claimed, and will then mark it in some manner, thus reserving it for future harvest or use. In the case of fruit trees, whether they are *molong* by an individual or by the community is dependent on the particular species. … Even young children actively claim trees, and by adulthood may have accumulated several dozen fruit trees and sago clumps. Significantly, there are a large number of trees … which are specifically named. … Many of these trees are recognized as having been *molong* by long-dead ancestors and are thus a further source of continuity between past generations and the present. (Brosius, 1986, pp. 175–176)[17]

Having defined the *molong* concept, I then proceeded to describe the process of sago production, contextualizing this with reference to the reproductive ecology of *Eugeissona*. I described how *Eugeissona* reproduces both by seeds and vegetatively and concluded that:

… while the processing of sago in a particular area over a period of several months may lead to temporary depletion, this harvesting strategy does not negatively affect its long-term growth. It appears likely that the thinning of *Eugeissona* in the process of exploitation may actually enhance the production of starch and viable seed. … This is not to say that *Eugeissona* cannot be over-harvested and thus depleted. Indeed it can, particularly when the harvesting cycle in a particular sago stand is too short and clumps are not allowed to sufficiently recover before being re-harvested. For this reason the Penan are concerned to maintain a sound harvesting strategy which avoids a foreshortened harvest cycle. When the sago in one area has been depleted, it is left to recover over a period of years. The Penan attitude with regard to *Eugeissona* resources is one of explicit stewardship. (Brosius, 1986, p. 177)

Finally, I discussed the implications of Penan resource use for development policy. My purpose in doing so was to demonstrate "the inadequacy of the notion of the Penan as a people without a sense of place, existing in an anonymous landscape" (ibid, p. 179). I noted that "a sense of stewardship constantly informs the manner in which they exploit their environment" (ibid, p. 179), and ended with the statement that "the Penan are conscientious resource managers, fully aware of sustained-yield principles. They exploit their environment in a way that preserves its long-term ecological integrity" (ibid, p. 182). Given the intent of the article (which also contained a number of specific policy recommendations and suggestions for principles upon which Penan land claims might be legally encoded), I felt it was important to make a clear case for the validity of Penan principles of resource management. Whatever the shortcomings of this article, the information provided is firmly grounded in field research, and constitutes an accurate description of Penan landscape knowledge and principles of resource use. Let us now turn to the way that this description has been transformed in the process of Davis and Henley's (re)presentation.

In each of Davis' individual essays (Davis, 1990, 1992, 1993), and in the essay co-authored by Davis and Henley (Davis and Henley, 1990a), the issue of Penan resource management is addressed. In one essay, referring generally to the significance of Penan botanical knowledge, Davis states that "For the Penan all of these plants are sacred, possessed by souls and born of the same earth that gave birth to the people" (Davis, 1990, pp. 98–99). In reference to the usage of *Eugeissona*, Davis and Henley state that:

If there is a pattern to the Penan migration, it is determined by the sacred growth cycle of the sago palm. It is a journey that may take twenty years to complete, an itinerary first described by the ancestors at a time when the earth was young and still wet with the innocence of birth. (1990a, p. 106)

Broadening this description to general principles of resource use, they suggest that:

Their biological adaptation, together with their spiritual beliefs, demand that they exploit the forest in a sustainable manner. Central to their worldview is a sacred obligation to bequeath to the following generations a healthy forest fully capable of providing life to its human inhabitants. (ibid, p. 107)

Finally, Davis and Henley provide a rather embellished description of the *molong* concept:

This Penan notion of stewardship is encapsulated in *molong*, a concept that defines both a conservation ethic and a notion of resource ownership. To *molong* a sago palm is to harvest the trunk with care, insuring that the tree will sucker up from the roots. *Molong* is climbing a tree to gather fruit, rather than cutting it down, harvesting only the largest fronds of the rattan, leaving the smaller shoots so that they may reach proper size in another year. Whenever the Penan *molong* a fruit tree, they place an identifying sign on it, a wooden marker or a cut of a machete. It is a notice of effective ownership and a public statement that the natural product is to be preserved for harvesting at a later time. In this way, through time, the Penan have allocated specific resources—a clump of sago, fruit trees, dart poison trees, rattan stands, fishing sites, medicinal plants—to individual kin groups. The Penan acknowledge these as familial rights that pass down through the generations. In many cases the identifying mark on a particular tree takes the form of two parallel sticks—a sign that acknowledges ownership while inviting the wayfarer to share at the proper time in the bounty of the resource. It is the equivalent of a private property sign that reads "please share wisely" rather than "no trespassing." (ibid, p. 114)

Close examination of the preceding statements reveals a number of inaccuracies: the fact that Davis and Henley do not acknowledge the distinction between Eastern and Western Penan, that they infer a system of direct inheritance, and that they include such things as fishing sites and medicinal plants in their discussion of the *molong* concept. More disconcerting, however, is an apparent need to embellish their description with reference to a form of ecological ethereality that is derived entirely from the Western romantic tradition and has little relation to any set of ideas that would be recognizable to Penan.

Concepts of Landscape

The same characteristics present in Davis and Henley's description of resource management are also evident in the way they describe Penan concepts of landscape. Again this is derived largely from material published by this author. In my 1986 article, I described something of the depth of Penan knowledge of the landscape: the richness of vocabulary for talking about landforms and rivers, the way in which rivers form the skeleton around which environmental knowledge is organized, and how river names incorporate geographical, ecological, historical, and genealogical information.

My intent was to demonstrate how Penan encode ecological information in the naming of landscape features, and to demonstrate the coherence existing between the physical landscape, history, genealogy, and the identities of individuals and communities. I described Penan landscape knowledge as follows:

> A conspicuous feature of the Penan environment is rivers. … The importance of rivers to the Penan can scarcely be underestimated. In an environment where visibility seldom exceeds 200 ft, these rivers and streams form the skeleton around which environmental knowledge is organized. … When traveling in the forest, Penan are always cognizant of their precise location relative to various rivers. This keen sense of spatial relationships derives from an awareness of the relative size of rivers, the angle of flow of one river to another, the topography between particular rivers, the proximity of headwaters of different rivers, and other sorts of environmental cues. … To Penan however, the landscape is more than simply a vast, complex network of rivers. Above all it is a reservoir of detailed ecological knowledge and a repository for the memory of past events. (Brosius, 1986, pp. 174–175)

I then proceeded to describe how rivers are named—for persons, for landscape features, for ecological features, or for particular events—and how, in turn, the deceased are spoken of with reference to rivers. I also described the significance of such naming practices in establishing the "cultural density" of the landscape:

> … the landscape itself serves as an idiom of the maintenance of historical and genealogical information. This idiom is more than a trivial mode of expressing nostalgia. … It is an important mnemonic device for the maintenance of social relationships. … At the same time it serves to establish the rights of Penan communities to exploit the resources of a given area. The rivers in which the ancestors are buried are the source of livelihood for their living descendants. (ibid, p. 175)

This discussion of the nature of Penan knowledge of the landscape is altogether transformed by Davis and Henley. Davis states that "For the Penan this forest is alive, pulsing, responsive in a thousand ways to their physical needs and their spiritual readiness" (Davis, 1990, p. 98). Trees are "blessed with spirits, the animals imbued with magical powers" (ibid, p. 99). Discussing the Penan's skill as "naturalists," Davis suggests that it exists because they identify "both psychologically and cosmologically with the rainforest" (ibid, p. 99). Further, "for Penan, every forest sound is an element of a language of the spirit" (ibid, p. 99). Davis states that:

> To walk in God's forest is to tread through an earthly paradise where there is no separation between the sacred and the profane, the material and the immaterial, the natural and the supernatural. (ibid, p. 99)

Davis and Henley maintain that "Fearful of the heat of the sun, ignorant of the seas, insulated from the heavens by the branches of the canopy, their entire cognitive and spiritual world became based on the forest" (Davis and Henley, 1990a, p. 106). Finally, in a more recent work, Davis asserts that:

> The Penan view the forest as an intricate, living network. Imposed from their imagination and experience is a geography of the spirit that delineates time-honored territories

and ancient routes that resonate with the place names of rivers and mountains, caves, boulders, and trees. (Davis, 1993, p. 25)

What we observe in the statements above is a strategy by which a pattern of recognizing landscape and encoding knowledge about that landscape is transformed into an obscurantist, essentializing discourse which in fact elides the substantive features of that knowledge. The implications of this will be considered in the discussion to follow.

The Rhetoric of Medicinal Plants

A central element of environmentalist rhetoric on rainforest preservation concerns the value of such forests for the potential medicines they might provide Western science, and the importance of indigenous knowledge as a key to the discovery of those medicines. In the film *The Penan: A Disappearing Civilization in Borneo*,[18] the narrator provides the following commentary:

> The greatest reason for protecting this rainforest is perhaps found in the Penan's knowledge of forest products with medicinal purposes. The stem of a certain leaf cures stomach pains, the inner bark of a tree reduces headache and fever within seconds of being applied to one's forehead. When asked if there are any plants nearby that are good for medicine, the Penan will reach for a dozen or more where they stand and explain their use.
> With more than 40,000 years of experimentation and observation, the Penan have enormous medical knowledge which Western scientists cannot duplicate. Today less than one percent of the world's tropical forest plants have been tested for pharmaceutical properties. Yet 25% of all our medicine comes from the rainforest. Three-quarters of all anti-cancer drugs are rainforest derivatives. As hundreds of thousands of acres of Sarawak's primary forests are succumbing to chainsaws, the world is coming to realize that this is the tragedy affecting us all.

Though in these cases referring to the Penan, such statements are common in contemporary rainforest conservation rhetoric more generally.

Given his background in ethnobotany and ethnopharmacology, Davis was particularly interested in documenting Penan knowledge of medicinal plants. On his first visit to Sarawak, Davis devoted considerable attention to collecting medicinal plants and to talking with Penan about their uses. According to Davis and Henley:

> Preliminary ethnobotanical surveys suggest that the Penan employ over fifty medicinal plants which they harvest from the primary forest. … The first challenge in assessing the potential of other Penan pharmacopoeia entails understanding the belief system that mediates their use of medicinal plants. (Davis and Henley, 1990a, p. 117)

Davis and Henley then proceed to expand on what they mean by "belief system":

> In general indigenous medicine is based on a thoroughly non-western conception of the etiology of disease in which health is defined as a coherent state of equilibrium between the physical and spiritual components of the individual. Health is wholeness, which in turn is perceived as something holy. … (ibid, p. 117)

They proceed to discuss a melange of Penan/indigenous theories of disease and, in so doing, again make a plea for the preservation of Penan medicinal knowledge:

> With a spirit world that is alive, the Penan quest for healing and well being is rooted both in magico-religious belief and a perspicacious knowledge of pharmacologically active plants. Understanding their folk medicine and identifying those of their plants that may ultimately serve the needs of all human societies is a complex and time consuming task. Unfortunately, as in the case of indigenous societies throughout the world, the traditional knowledge is being lost at a tremendous rate. Logging activities are destroying the source of the medicines even as the forces of acculturation disrupt the integrity of the belief system itself. (ibid, p. 118)

Finally, referring to the complaints of one Penan featured in their 1990 book about the ineffectiveness of medicines provided by the government, Davis and Henley state, "What Dawat is saying is that a synthetic drug cannot replace the spirit of the plants, imbued as they are with the power to heal" (ibid, p. 118).

One of the more interesting consequences of the environmentalist rhetoric of medicinal plants—evident in the preceding quote—is that this rhetoric has itself suffused back to the Penan and been adopted by them as their own. When one visits Penan today, in those areas where blockades have occurred, one of the consequences of forest destruction they most commonly decry is the loss of medicinal plants. As my data collection among Eastern Penan in blockade areas proceeded, I was struck by the frequency with which I heard such statements. In 3 years with Western Penan in the 1980s—in a non-blockade area, and in a mostly pre-blockade era—I rarely heard medicinal plants mentioned or discussed in any context. Certainly Western Penan knew of several, but these tended to be few and to be used for a very broad range of illnesses. I encountered none of the nonstop commentary on the value of traditional medicinal plants that is so evident today when one walks through the forest with Eastern Penan. When I first began working among Western Penan, I fully expected that I would hear much more on this subject. In 1980, I conducted fieldwork among Pinatubo Atya in the Philippines, who have an enormous knowledge of medicinal plants (Fox, 1952) and who constantly pointed them out. What struck me about Western Penan in the 1980s is that they showed so little interest in medicinal plants. In the 1990s, Western Penan in the Belaga District still did not, yet Eastern Penan in the Baram District—that is, in those areas visited by environmentalists—did so with remarkable consistency.[19]

Davis and Henley are not alone in stressing the richness of Penan knowledge of medicinal plants. Other environmentalists writing about the Penan also frequently mention this. Part of the reason for this is that they are told about such plants by Penan. I believe that what we are observing here is what might be termed the "Plotkinization" of the discourse of indigenous knowledge of medicinal plants. Mark Plotkin, of course, has been a leading figure in developing an awareness of the depth of ethnobotanical knowledge of medicinal plants among indigenous peoples in Amazonia.[20] This awareness has diffused into the rhetoric of rainforest conservation in many ways: it has now become standard practice to describe the depth of knowledge of medicinal plants of particular rainforest societies. Such knowledge may exist in

other indigenous societies, but it is much less significant among Penan than recent statements would lead one to expect. This is a kind of ethnographic hall of mirrors; drawing on rhetorics derived from an Amazonian context, environmentalists have brought assumptions derived from a familiarity with Plotkin's work to the Penan, who then repeat it back to other environmentalists, who take it as an exemplar of the depth of indigenous knowledge. Precisely how this has occurred is nearly impossible to reconstruct, but it would seem that it occurs in the myriad conversations that have occurred between Penan and the environmentalists who have visited them. Penan take note of the Western gaze on medicinal plants and turn it back to them as commentary.

Discussion

Drawing mostly on the writings of Davis and Henley as an exemplar of a more general phenomenon, I have attempted to show in one ethnographic context how indigenous "knowledge" is represented and transformed. It has not been my goal to simply provide a particularistic critique of how one group of people have been portrayed and to describe what Penan are "really" like. Nor is this discussion intended as a critique of Western representations of the "other." That would hardly be very original. Rather, this case raises several fundamental questions about how objective conceptions of knowledge are appropriated and deployed in environmental campaigns, and what the consequences of this might be.

There are, in fact, several ways in which the objectivist conception of knowledge has been transformed in the texts I have provided. I have focused on one in particular in the first two cases discussed above: how indigenous "knowledge" is linked to the sacred or ineffable. As noted, it is transformed into wisdom, spiritual insight, or some other such quality. This transformation serves a certain purpose. In describing peoples such as the Penan, the problem for environmentalists and indigenous rights activists is twofold. First, how does one make a society narratable? That is, what must one do to be able to talk about it? However one defines indigenous knowledge, it is not easily accessible. It is not something that can be picked up in a few short weeks, particularly for individuals lacking linguistic competence. The problem for environmentalists is how, nevertheless, to create texts about peoples such as the Penan, and how to talk about the knowledge which they hold to be so valuable without actually comprehending much about that knowledge. Second, how does one create value? Environmentalist and indigenous rights campaigns are generally concerned with peoples who are "endangered" precisely because they, their institutions, and their systems of land-tenure are disvalued by national governments. The Malaysian government considers the Penan a national embarrassment, a people who represent precisely those things they are trying to overcome in their national development efforts. The goal of environmentalists then is axiological: to demonstrate both to the government and to Western audiences what is at stake if the forest, and the Penan, are destroyed.

By reducing Penan knowledge to the sacred or ineffable, the Penan are made both narratable and valuable. In linking knowledge to the sacred, commentators acquire a

way to construct meta-commentaries about the *meaning* of a body of knowledge, rather than about that knowledge itself. The danger, of course, is that such meanings may only be interpolated and may, in fact, be Western in origin.

In short, the discourse of the sacred serves to make Penan narratable, all the while serving to elide gaps in understanding. At the same time it also imbues them with value: a value that authors themselves feel in a most profound way, but cannot otherwise articulate. It makes land, resources, and people inviolable, and it does this by appealing to preexisting categories of value: the endangered, the last whisper of an ancient past. As David Suzuki said of one Penan, "Listen to Dawat. He is what we once were" (Suzuki, 1990, p. 8).

The meta-commentary on the sacred or ineffable has a number of pernicious effects. The most obvious is that it imposes meanings on Penan "knowledge" that may be quite imaginary. In imposing some meanings, it expunges others. Penan certainly have some sense of the ineffable, and this is expressed in a range of concepts relating to power, avoidance, respect, and so forth (see Brosius, 1992, 1995, 1995–96). But it is nothing like the obscurantist sanctity Davis and Henley describe. Reducing the ineffable to "sacred" transforms and distorts it.

Second, it paradoxically makes generic precisely the diversity that it is trying to advance. Whatever else sanctity is, it is not a universal category. In presenting Penan knowledge as wisdom or insight having a sacred quality, one is imposing a falsely universalized quality on a range of peoples, and thereby collapsing precisely the diversity that defines them. The Penan are transformed into a homogenous "indigenous people," or "forest people." This is a very common—and often quite explicit—element in contemporary commentaries on indigenous rights. For instance, Durning states that "Amid the endless variety of indigenous belief, there is striking unity on the sacredness of ecological systems" (Durning, 1992, pp. 28–29). According to Native American activist Winona LaDuke:

> Traditional ecological knowledge is the culturally and spiritually based way in which indigenous peoples relate to their ecosystems. This knowledge is founded on spiritual-cultural instructions from "time immemorial" and on generations of careful observation within an ecosystem of continuous residence. (LaDuke, 1994, p. 127)

Suzuki and Knudtson describe "this ancient, culturally diverse aboriginal consensus on the ecological order and the integrity of nature [which] might justifiably be described as a 'sacred ecology' …" (Suzuki and Knudtson, 1992, p. 18). Barreiro asserts that:

> Indigenous cultures are rich in ecological concept. "Our Mother the Earth" is a reality in the cosmologies of virtually every native people in the world. … It is one of the currents of thought that make up Pan-Indigenous philosophy and a basic message of the Indian peoples. (Barreiro, 1991, p. 200)

And Wade Davis describes the Penan as "Related in spirit to the Mbuti pygmies of Zaire and the wandering Maku of the Amazon" (Davis, 1993, p. 24).

The discourse of medicinal plants is something else again. I do not mean to suggest that Eastern Penan lack knowledge of medicinal plants. Rather, what is significant is the way in which Penan presently emphasize and elaborate on this domain of knowledge

as a central element of their objections to logging, a product of environmentalist involvement with Penan. Indigenous knowledge of medicinal plants forms a highly narratable domain and invests environmentalist statements about the Penan with an aura of authority. As such, it becomes a locus around which environmentalists and Penan can converse. One might argue that those domains of indigenous knowledge that are most accessible in this manner are elevated to a particularly important status in the discourse of endangered knowledge.

In the preceding discussion, I have attempted to show how, in an effort to make a people narratable and to create value (all the while essentializing them as "forest people"), environmentalist discourse about indigenous knowledge has the potential to transform that knowledge into something it is not. To save something, or to mobilize an audience to want to save something, requires that it be made beautiful or profound, or have some transcendent value. In creating that value, however, the thing itself is transformed. Thus the rich, if generally mundane, Penan knowledge of the forest landscape by being transformed into something that is sacred, valued, and thus to be saved, is constructed in terms of categories that are Western in origin. We see here a hall of mirrors of representation—simulacra—as Penan knowledge is transformed into something that it is not, and Western discourses are transported to Penan, who again convey them to Western interlocutors. The essential—and diverse—qualities of indigenous knowledge are lost along the way. As the future of the forests, other biomes, and indigenous peoples is negotiated in the years ahead in a plethora of post-Rio international fora, the issue of who talks for whom and who constructs representations of whom is critical.

NOTES

1. I translated this interview in 1989 for the Davis and Henley volume for which Dawat Lupung, the individual interviewed, was awarded the Reebok Human Rights Award.

2. In the U.S., for example, the issue of logging in Sarawak has been covered in *Newsweek, Time, The New Yorker, The Wall Street Journal,* and *Rolling Stone*; on National Public Radio, NBC Evening News, CNN, and on the programs *National Geographic Explorer* and *Primetime Live.* Figures as diverse as Al Gore, Jerry Garcia, and Prince Charles have spoken out on behalf of the Penan.

3. In this sense, referring to it as a "campaign" is inaccurate, since this would seem to imply centralized coordination. Certain organizations acted as clearinghouses for information or promoted particular strategies, but no single organization choreographed all the events that have transpired over the matter of logging in Sarawak since the mid-1980s. I refer to it as a campaign only as a matter of convenience. I must also stress that although most environmental organizations have focused their attention on the Penan, many environmentalists have insisted that this not be seen as a Penan issue exclusively. They argue that the concern should be for indigenous rights in Sarawak in general.

4. In the following discussion, reference to *environmentalists* should be understood to refer both to representatives of environmental organizations such as *World Wide Fund for Nature* and *Greenpeace*, as well as to representatives of indigenous rights organizations such as *Survival International* and *Cultural Survival*. Though these two types of organizations have at times been at odds, there has been some movement in recent years toward a convergence of interests.

5. Davis received his PhD in Ethnobotany from Harvard University under the supervision of the prominent ethnobotanist Richard Schultes, and is most well-known as the author of *The Serpent and the Rainbow* (Davis, 1985). In the late 1980s, a controversy developed around Davis' work on Haitian voodoo (see Booth, 1988; Yasumoto and Kao, 1986). Henley, before he became involved in the Sarawak issue, was instrumental in organizing the campaign to protect the Queen Charlotte Islands, one of Canada's most historically significant environmental campaigns. Within the context of the Sarawak campaign, Henley's most active role was in organizing the 1990 *Voices for the Borneo Rainforest World Tour*, a series of events that brought two Penan and one Kelabit activist to Australia, Japan, North America, and Europe—some 18 countries in all. Henley and Davis, along with several other individuals, co-founded the *Endangered Peoples Project*, a foundation "dedicated to the promotion of biological and cultural diversity" (Henley, 1990, p. 93).

6. In discussing how Western environmentalists have represented the Penan, it is not my intention to question the validity of the concerns that motivate those within the environmental movement: I share their concern with ecological degradation and its effects on indigenous peoples. My comments are directed at particular theoretical strategies: not at the broader concerns that underlie them. Furthermore, whatever my misgivings about the forms of rhetoric examined here, I feel it is important to acknowledge the positive contribution that individuals such as Wade Davis and Thom Henley have made in bringing the situation of the Penan to the attention of the public in the U.S. and Europe.

7. Eastern and Western Penan in Sarawak together number some 7000 individuals. The Eastern Penan total some 4500 in approximately 50 communities, while Western Penan total some 2500 in 18 communities. These figures are updated from figures I have provided in previous publications and reflect estimations of population growth since 1987, when I carried out a census of Western Penan. In addition to Eastern and Western Penan, there are also several small groups of Penan who have been settled for a century or more and who have little interaction with either Eastern or Western Penan. These include the Penan Nyivung, Penan Bok, Penan Suai, and Penan Jelalong (for more information on Penan in Sarawak, see Arnold, 1958; Brosius, 1986, 1988, 1990, 1991a,b, 1992, 1993a,b, 1995, 1995–96; Harrisson, 1949; Huehne, 1959; Kedit, 1978, 1982; Langub, 1972a,b, 1974, 1975, 1984, 1988, 1989, 1990; Needham, 1954a,b,c,d, 1965, 1972; Nicolaisen, 1976a,b, 1978; Urquhart, 1951, 1957, 1959).

8. These figures refer to band size prior to settlement. Both Eastern and Western Penan communities tend to experience growth once settlement occurs (see Arnold, 1958; Needham, 1972; Urquhart, 1951).

9. Among both Eastern and Western Penan the trend toward sedentism has accelerated greatly since about 1960. I estimate that in 1960, 70–80% of all Eastern and Western Penan were still nomadic. Of 7000 Eastern and Western Penan today, fewer than 400 Eastern Penan in the vicinity of the Magoh, Tutoh, and upper Limbang River areas remain fully nomadic, approximately 5% of the total. The last nomadic Western Penan settled ca. 1970.

10. In addition to SAM another local NGO, the *Sarawak Indigenous Peoples Alliance* (SIPA), also played a key role in the campaign for a short time. SIPA was forced to disband by the Sarawak government in 1992 after founder Anderson Mutang Urud was arrested.

11. Among the environmental and indigenous rights organizations who have been involved in the Sarawak campaign are *Rainforest Action Network* (U.S.), *Friends of the Earth, Greenpeace, Western Canada Wilderness Committee, Japan Tropical Forest Action Network, Rettet den Regenwald* (Germany), *Robin Wood* (Germany), *Society for Threatened Peoples* (Austria, Germany, Switzerland), *ProRegenwald* (Germany), *Nepenthes* (Denmark), *Global 2000* (Austria), *Bruno Manser Fonds* (Switzerland), and the *Rainforest Information Center* (Australia). Their activities

have ranged from letter-writing campaigns to attempts at tropical timber boycotts, protests at Malaysian embassies, ship blockades in Europe and Australia, and direct actions in Sarawak itself.

12. As this article was under review, I received from Davis a copy of his most recent book on the Penan, co-authored with Ian Mackenzie and Shane Kennedy (Davis, Mackenzie, and Kennedy, 1995). Though it retains some of the romanticized language that appears in previous works by Davis and Henley, in this most recent piece an effort was made to provide a more realistic portrait of the Penan by a more balanced use of ethnographic material and by the inclusion of numerous translated Penan commentaries.

13. See Brush and Stabinsky (1996) for a comprehensive overview of issues involved in establishing a legal basis for the recognition of indigenous intellectual property rights.

14. Bruno Manser is a conspicuous exception here; having lived with Penan for over 6 years, he became a fluent speaker of the Eastern Penan language.

15. The process by which campaigns develop is extremely complex, particularly with respect to the relationship between the initial analysis of a particular context, decisions about how to proceed in a campaign, and the representations that are ultimately produced and deployed. Most environmental and indigenous rights organizations are self-consciously aware of the contrast between the images they purvey and the realities of a given situation, but they must also necessarily provide persuasive images. In any event, it is a mistake to equate the often bold simplicity of campaign images with the processes of analysis and debate that both precede and follow their deployment.

16. Since providing this initial definition "to preserve," I have further clarified the semantic content of the term *molong* (Brosius, 1991a, 1992, 1993a). It conveys the sense of fosterage as well as preservation. The *molong* concept does not constitute ownership of resources: rather, it encompasses a somewhat individuated, proprietary concept of stewardship. Other members of the community may exploit resources which are individually claimed, but they must inform the individual who has claimed that resource. The *molong* system does two things: (1) it serves as a way to monitor information on the availability of resources over vast tracts of land, and (2) it prevents the indiscriminate cutting of fruit trees and sago, resources which might otherwise be seriously depleted. In one sense, the entire Western Penan settlement system may be seen as a temporalized manifestation of the *molong* concept.

17. It should be noted that Eastern Penan do not *molong* resources to the same degree as Western Penan. Eastern Penan do employ the word *molong* (and the synonym *mulah*), but the concept plays a relatively minor role in Eastern Penan notions of resource management, particularly in its individual aspects. This is not to say that Eastern Penan lack any sense of stewardship over the resources in their foraging areas. It is simply that Eastern Penan concepts of resource management are less formalized and individuated than those of Western Penan.

18. Produced by the Endangered People's Project (Mill Valley, CA) and the Congressional Human Rights Foundation (Washington, DC), written by Thom Henley, and released in 1989.

19. I do not mean to imply that the Penan are lacking ethnobotanical knowledge. Indeed, their knowledge of forest plants is considerable. However, this knowledge tends to focus on plants whose utility is rather mundane: fruit trees, trees that are suitable for firewood, varieties of rattan useful for making particular types of items, and the like. It is for this reason that the contemporary Eastern Penan emphasis on the threat to medicinal plants is so remarkable.

20. Like Davis, Plotkin was trained by Richard Schultes. Long before the theme of indigenous knowledge of medicinal plants became an element of rainforest conservation rhetoric, Schultes impressed upon his students the potential importance of studies focusing on this topic among native Amazonians.

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Tribal Whaling Poses New Threat

Will Anderson

There are few symbols as powerful as the sight of a whale in her death throes, thrashing in agony from a whaler's explosive harpoon. Now, despite the efforts of whale advocates, the long and arduous campaign to end the killing of all whales is nearing catastrophe.

The source of this imminent disaster is the 1855 Treaty of Neah Bay (the Treaty) that in Article IV states, "The right of taking fish and of whaling or sealing at usual and accustomed grounds and stations is further secured to said Indians in common with all citizens of the United States." The Makah (who call themselves Ko-ditch-ee-ot, which means People of the Cape) are part of the Nuu-cha-nulth culture that extends north to Vancouver Island, Canada, and were regarded as the best indigenous whalers on the West Coast. Whale hunting was central to the Makah cultural identity. The blubber, bones and by-products from the whales enabled the Makah to prosper. Extensive spiritual rituals, lasting several months, included fasting, sexual abstinence, self-flagellation and prayers. These preparations were considered essential before the select few whalers went to sea. In a tight tribal hierarchy, it was the whaling families who had the greatest power to rule as chiefs. Now, after a 70-year lapse in which the Makah have not whaled, and at a time when there is zero nutritional subsistence need for whales, they wish to reassert their Treaty right to kill gray whales, protected internationally since 1946. Though there is no obvious way in which it could be done legally at the present time, many in the Makah community believe there will be a way to make money from the renewed whaling.

On May 5, 1995, the Makah Tribal Council (MTC) Chair, Hubert Markishtum, wrote to the US government asking it to represent the Makah before the International Whaling Commission (IWC), the international body that passed a 1986 moratorium on commercial whaling. The Makah requested the US Departments of Commerce and State "… to represent the Tribe in seeking International Whaling Commission ("IWC") approval of an annual interim ceremonial and subsistence harvest of up to five (5) gray whales." The letter also stresses, "It should be emphasized, however, that we continue to strongly believe that we have a right under the Treaty of Neah Bay to harvest whales not only for ceremonial and subsistence but also for commercial purposes."

Though the Makah feel that the IWC does not have ultimate authority over their treaty rights, they attended the 1996 IWC meeting in Aberdeen, Scotland, traveling from their ancestral home of Neah Bay located in the extreme northwest corner of Washington State. The US apparently felt obligated, under the Treaty, to represent the Makah at the IWC. What surprised the opponents to whaling was the ferocity of the US delegation, headed by Dr. James Baker, as he proceeded to make the Makah proposal the overriding issue.

Neither Endangered, Nor Safe

On June 16, 1994, at the request of the Northwest Indian Fisheries Commission (NWIFC), the gray whale (*Eschrichtius robustus*) was removed from the endangered species list. It was the Makah, members of NWIFC, who initiated the de-listing. Twice, the 40- to 50-foot gray whale (*Eschrichtius robustus*) has been driven to near extinction by non-native commercial hunters. Gray whales inhabit near-shore coastal waters and therefore are vulnerable to human activity. During the summer, they feed in shallow waters off of North America and Russia and, after making the longest known migration of any mammal (up to 12,500 miles from Mexico to the Bering Sea), return to the warm waters of Mexican lagoons in winter to mate and give birth to the next generation. However, pollution, loss of habitat, increasing boat traffic and pressures caused by a rising human population are threats to the mere 23,000 gray whales living today. Several gray whales are "residents" in Washington State for part of the year, often staying at Neah Bay and Makah Bay, within a harpoon's throw of a Makah whaler.

Over the past few decades, whale behavior has changed in response to the cessation of whaling. Friendly encounters between trusting whales and humans are becoming common.

If renewed whaling occurs, gray whale feeding, mating and resting activities could be easily disturbed because the whales may begin to fear all passing boats, even those with no harmful intent. Once they learn to avoid vessels, the countless interactions between whales and boats will likely result in more flee responses, interruptions in feeding behaviors, disruptions of mother-calf interactions and fewer opportunities for whales to rest.

Global Implications

IWC approval of Makah whaling would have a profound effect on other whales (there are also thirteen tribal Indian bands in Canada and an Alaska Eskimo Whaling Commission that have stated their intent to kill gray whales). Whale protectionists familiar with the IWC know that the biggest beneficiaries of a Makah IWC victory would be the Japanese, Norwegian, and other commercial whalers.

For years, Japan and Norway have supported culturally based Small Type Coastal Whaling as a way to re-enter commercial killing of whales. The Makah have lived 70

years without whale meat, so they cannot argue a need for subsistence, an IWC requirement up to now. If the IWC approves the Makah request on a purely cultural basis, the change in IWC criteria could open the door for the commercial whalers in many smaller towns with a cultural whaling history. That could effectively end the IWC moratorium on the commercial killing of whales.

Save The Whales

The Makah Tribal Council nearly won this year. Were it not for the cooperative efforts of environmental and animal welfare advocates, the Makah could have been whaling as early as this fall. What the US IWC delegation did not count on were several Makah Elders who wrote and signed a half-page letter of opposition that was published (again, with funds from several environmental and animal welfare organizations) in the local Peninsula Daily News.

In the public letter, the Elders stated, "… there is no spiritual training going on. We believe they, the Council, will just shoot the Whale, and we think the word 'subsistence' is the wrong thing to say when our people haven't used or had Whale meat/blubber since the early 1990's." They continue, stating, "For these reasons we believe the hunt is only for the money." Other parts of the letter take issue with the Makah Tribal Council's failure to properly put the whaling proposal to the full tribal membership.

Soon afterwards, two Makah, Alberta Thompson, an elder, and Dottie Chamblin, who has a background in traditional medicine and oral whaling history, volunteered to go to the IWC meeting in Scotland and lobby against their own corporate form of government (disagreements between traditional elders and their formal tribal governments are not uncommon. The Indian Reorganization Act of 1935 forced all US tribes to take on a corporate form of government, replacing the various forms of traditional tribal governments that inherently gave Elders a great influence).

At the IWC meeting, Alberta and Dottie destroyed the legitimacy of the US position and the delegation sent by the corporate Makah Tribal Council. At the same time Republican Jack Metcalf, of Washington State, and Democrat Jack Miller, of California, introduced a resolution condemning the Makah proposal in the House Committee on Resources. The resolution passed unanimously. With phenomenal teamwork by many people lobbying and representing their organizations, the US delegation was forced to withdraw the proposal. The MTC, for its part, has vowed to return next year for one more try, stating they will go whaling regardless of the IWC's next decision. That would make the US government an outlaw pirate whaling nation if it does not enforce the moratorium with the Makah.

Modern Life

Neah Bay, the center of Makah cultural and economic life, is a town emerging from a recession, but retaining modern conveniences and services. A new 7.8 million dollar

marina will open next year. The town boasts a new head start school, a modern K-12 school campus with night-lit athletic fields, Federal Express deliveries, a super market, subsidized bus service to the city of Port Angeles, tennis courts, and, according to MTC meeting minutes, the largest tribal budget ever. Batelle Institute estimates that thousands of jobs will be created with new ventures into aquaculture. Tourism related to natural and cultural attractions has tripled in the past three years.

Neah Bay is not without its problems, but killing whales will not solve them. Efforts to instill cultural identity in their youth faces competition from television and the distractions of modern life. Killing whales is supposed to end the same social ills that plague many cities and towns: drug abuse, crime, and disintigrating families. Like many non-native communities in Washington dependent on timber and fisheries, there have been difficult economic times. Quotas for salmon and timber are a fraction of the previous decade. Seasonally high unemployment creates conditions for substance abuse and places strain on the community. Some housing needs upgrading. The Tribal Council is always looking for more money, and has not denied that somehow whaling will bring additional, substantial revenues. Several tribal members have stated this belief. Whaling opponents do not readily see how this will happen as it appears to be legally impossible for a profit to be made. Whether the Makah believe that commercial whaling will eventually be legal in the US, or that they feel there is a loophole in current law, is unknown. Certainly other tribes in Washington State feel they can legally enter into commercial sealing, since they have stated their intent to do so "as soon as a market is found."

But whaling opponents feel that Makah efforts will not result in a stronger Makah position. Quite the opposite; the social and political firestorm that will erupt if the Makah actually begin killing whales could erode or destroy the Treaty of Neah Bay itself. Public furor in opposition to whaling will translate into political demands that Congress at the least re-negotiate the Treaty so that whales are not killed.

Must We Start Over?

Gray whales are born in Mexico, then live out their long lives internationally. Our understanding and relationship with them has changed drastically since the Treaty was signed in 1855. Not surprisingly, it is the Elders who know how whale protectors feel, and what many of us have experienced in the presence of cetaceans. Whale advocates are still hopeful that the traditional Elders will prevail over the corporate MTC, to the benefit of the tribe and the whales. Meanwhile, non-Makah must instill in Congress the will to resist whaling at all costs. We also must convince the Clinton Administration that whaling is an inhumane, environmentally unsound policy. If we lose this struggle, the whales will feel the agony in oceans around the world.

On the Importance of Being Tribal
Tribal wisdom

David Maybury-Lewis

Tribal people hold endless fascination for us moderns. We imagine them as exotics trapped in a lyrical past, or as charming anachronisms embarking on the inevitable course toward modernity. What few of us realize is that tribal peoples have not tried (and failed) to be like us, but have actually chosen to live differently. It is critical that we examine the roads they took that we did not; only then can we get a clear insight into the choices we ourselves make and the price we pay for them—alienation, loneliness, disintegrating families, ecological destruction, spiritual famishment. Only then can we consider the possibility of modifying some of those choices to enrich our lives.

In studying tribal societies, as I have for 30 years, we learn that there is no single "tribal" way of life—I use the word here as a kind of shorthand to refer to small-scale, preindustrial societies that live in comparative isolation and manage their affairs without a central authority such as the state. But however diverse, such societies do share certain characteristics that make them different from "modern" societies. By studying the dramatic contrasts between these two kinds of societies, we see vividly the consequences of modernization and industrialization. Modernization has changed our thinking about every facet of our lives, from family relationships to spirituality to our importance as individuals. Has ours been the road best traveled?

Strange Relations

The heart of the difference between the modern world and the traditional one is that in traditional societies people are a valuable resource and the interrelations between them are carefully tended; in modern society things are the valuables and people are all too often treated as disposable.

In the modern world we shroud our interdependency in an ideology of independence. We focus on individuals, going it alone in the economic sphere, rather than persons, interconnected in the social sphere. As French anthropologist Marcel Mauss put

it, "It is our Western societies that have recently turned man into an economic animal." What happened?

A truly revolutionary change—a social revolution centering on the rights of the individual—swept Western Europe during the Renaissance and eventually came to dominate and define the modern world. While traditional societies had denounced individualism as anti-social, in Western Europe a belief in the rights and dignity of the individual slowly came to be regarded as the most important aspect of society itself.

The glorification of the individual, this focus on the dignity and rights of the individual, this severing of the obligations to kin and community that support and constrain the individual in traditional societies—all this was the sociological equivalent of splitting the atom. It unleashed the human energy and creativity that enabled people to make extraordinary technical advances and to accumulate undreamed-of wealth.

But we have paid a price for our success. The ever-expanding modern economy is a driven economy, one that survives by creating new needs so that people will consume more. Ideally, under the mechanics of this system, people should have unlimited needs so that the economy can expand forever, and advertising exists to convince them of just that.

The driven economy is accompanied by a restless and driven society. In the United States, for example, the educational system teaches children to be competitive and tries to instill in them the hunger for personal achievement. As adults, the most driven people are rewarded by status. Other human capabilities—for kindness, generosity, patience, tolerance, cooperation, compassion—all the qualities one might wish for in one's family and friends, are literally undervalued: Any job that requires such talents usually has poor pay and low prestige.

The tendency of modern society to isolate the individual is nowhere more clearly evident than in the modern family. In the West we speak of young people growing up, leaving their parents, and "starting a family." To most of the world, including parts of Europe, this notion seems strange. Individuals do not start families, they are born into them and stay in them until death or even beyond. In those societies you cannot leave your family without becoming a social misfit, a person of no account.

When the modern system works, it provides a marvelous release for individual creativity and emotion; when it does not, it causes a lot of personal pain and social stress. It is, characteristically, an optimistic system, hoping for and betting on the best. In contrast, traditional societies have settled for more cautious systems, designed to make life tolerable and to avoid the worst. Americans, in their version of the modern family, are free to be themselves at the risk of ultimate loneliness. In traditional family systems the individual may be suffocated but is never unsupported. Is there a middle way?

Finding that middle way is not a problem that tribal societies have to face, at least not unless they find their way of life overwhelmed by the outside world. They normally get on with the business of bringing up children against a background of consensus about what should be done and how, which means that they can also be more relaxed about who does the bringing up. Children may spend as much time with other adults as they do with their parents, or, as in the Xavante tribe of central Brazil, they may wander around in a flock that is vaguely supervised by whichever adults happen to be nearby. As soon as Xavante babies are old enough to toddle, they attach

themselves to one of the eddies of children that come and go in the village. There they are socialized by their peers. The older kids keep an eye on the younger ones and teach them their place in the pecking order. Of course there are squabbles and scraps, and one often sees a little child who has gotten the worst of it wobbling home and yelling furiously. The child's parents never do what parents in our society often do— go out and remonstrate with the children in an attempt to impose some kind of adult justice (often leaving the children with a burning sense of unfairness). Instead they simply comfort the child and let her return to the fold as soon as her bruised knee or battered ego permits. At the same time, there is never any bullying among the Xavante children who are left to police themselves.

The Xavante system represents an informal dilution of parents' everyday responsibilities. In many societies these responsibilities are formally transferred to other relatives. In the Pacific Islands, for example, it is quite common for children to be raised by their parents' kin. Among the Trobriand Islanders, this is seen as useful for the child, since it expands his or her network of active kin relationships without severing ties to the biological parents. If children are unhappy, they can return to their true parents. If they are contented, they remain with their adoptive parents until adulthood.

Tribal societies also differ from the modern in their approach to raising teenagers. The tribal transition to maturity is made cleanly and is marked with great ceremony. In Western societies families dither over their often resentful young, suggesting that they may be old enough but not yet mature enough, mature enough but not yet secure enough, equivocating and putting adolescents through an obstacle course that keeps being prolonged.

Tribal initiation rites have always held a special interest for outside observers, who have been fascinated by their exotic and especially by their sexual aspects. It is the pain and terror of such initiations that make the deepest impression, and these are most frequently inflicted on boys, who are in the process of being taken out of the women's world and brought into that of the men. Some Australian Aboriginal groups peel the penis like a banana and cut into the flesh beneath the foreskin. Some African groups cut the face and forehead of the initiate in such a way as to leave deep scars.

Circumcision is, of course, the commonest of all initiation procedures. Its effect on the boy is, however, intensified in some places by an elaborate concern with his fortitude during the operation. The Maasai of East Africa, whose *moran* or warriors are world famous as epitomes of courage and bravado, closely watch a boy who is being circumcised for the slightest sign of cowardice. Even an involuntary twitch could make him an object of condemnation and scorn.

Initiation rituals are intended to provoke anxiety. They act out the death and rebirth of the initiate. His old self dies, and while he is in limbo he learns the mysteries of his society—instruction that is enhanced by fear and deprivation and by the atmosphere of awe that his teachers seek to create. In some societies that atmosphere is enhanced by the fact that the teachers are anonymous, masked figures representing the spirits. The lesson is often inscribed unforgettably on his body as well as in his mind. Later (the full cycle of ceremonies may last weeks or even months) he is reborn as an adult, often literally crawling between the legs of his sponsor to be reborn of man into the world of men.

Girls' initiation ceremonies are as dramatically marked in some societies as those of boys. Audrey Richards' account of the *chisungu*, a month-long initiation ceremony among the Bemba of Zambia, describes the complex ritual that does not so much add to the girl's practical knowledge as inculcate certain attitudes—a respect for age, for senior women and men, for the mystical bonds between husband and wife, for what the Bemba believe to be the dangerous potentials of sex, fire, and blood. The initiate learns the secret names of things and the songs and dances known only to women. She is incorporated into the group of women who form her immediate community, since this is a society that traces descent in the female line and a husband moves to his wife's village when they marry. Western writers tend to assume that it is more important for boys to undergo separation from their mothers as they mature than it is for girls. But the Bemba stress that mothers must surrender their daughters in the *chisungu* to the community at large (and to the venerable mistress of ceremonies in particular) as part of a process through which they will eventually gain sons-in-law.

The ceremony Richards observed for the initiation of three girls included 18 separate events, some 40 different pottery models (shaped for the occasion and destroyed immediately afterward), nearly a hundred songs, and numerous wall paintings and dances, all used to instruct the girls in their new status. All of this represents a large investment of time and resources. The initiation gives girls a strong sense of the solidarity and powers of women in a society that also stresses male authority and female submissiveness.

Ever since the influential work of Margaret Mead, there has been a tendency in the West to assume that, if growing up is less stressful in tribal societies, it is because they are less puritanical about sex. The modern world has, however, undergone a sexual revolution since Mead was writing in the 1930s and 1940s, and it does not seem to have made growing up much easier. I think that, in our preoccupation with sex, we miss the point. Take the case of tribal initiations. They not only make it clear to the initiates (and to the world at large) that they are now mature enough to have sex and to have children; the clarity also serves to enable the individual to move with a fair degree of certainty through clearly demarcated stages of life.

A Moral Economy

Since earliest times, the exchange of gifts has been the central mechanism through which human beings relate to one another. The reason is that the essence of a gift is obligation. A person who gives a gift compels the recipient either to make a return gift or to reciprocate in some other way. Obligation affects the givers as well. It is not entirely up to them whether or when to bestow a gift. Even in the modern world, which prides itself on its pragmatism, people are expected to give gifts on certain occasions—at weddings, at childbirth, at Christmas, and so on. People are expected to invite others to receive food and drink in their houses and those so invited are expected to return the favor.

In traditional societies, it is gifts that bond people to one another and make society work. It follows that in such societies a rich person is not somebody who accumulates

wealth in money and goods but rather somebody who has a large network of people beholden to him. Such networks are the instrument through which prominent people can demonstrate their prestige. They are also the safety net that sees an individual through the crises of life.

In modern societies these networks have shrunk, just as the family continues to shrink. There are fewer and fewer people to whom we feel obligated and, more ominously, fewer and fewer who feel obligated to us. When we think of a safety net, when our politicians speak of it, we refer to arrangements made by abstract entities—the state, the corporation, the insurance company, the pension fund—entities we would not dream of giving presents to; entities we hope will provide for us (and fear they will not).

Traditional societies operate a moral economy, that is, an economy permeated by personal and moral considerations. In such a system, exchanges of goods in the "market" are not divorced from the personal relationships between those who exchange. On the contrary, the exchanges define those relationships. People who engage in such transactions select exchange partners who display integrity and reliability so that they can go back to them again and again. Even when cash enters such an economy, it does not automatically transform it. People still look for just prices, not bargain prices, and the system depends on trust and interdependence. In traditional societies the motto is "seller beware," for a person who gouges or shortchanges will become a moral outcast, excluded from social interaction with other people.

An Ecology of Mind

The sense of disconnection so characteristic of modern life affects not only the relations between people but equally importantly the relations between people and their environment. As a result, we may be gradually making the planet uninhabitable. The globe is warming up and is increasingly polluted. We cannot take fresh air or clean water for granted anymore. Even our vast oceans are starting to choke on human garbage. The rain forests are burning. The ozone layer is being depleted at rates that constantly exceed our estimates.

How have we come to this? A hundred years ago science seemed to hold such promising possibilities. But the scientific advances of the 19th century were built on the notion that human beings would master nature and make it produce more easily and plentifully for them. Medieval Christianity also taught that human beings, although they might be sinners, were created in God's image to have dominion over this earth. Whether human dominion was guaranteed by the Bible or by science, the result was the same—the natural world was ours to exploit.

Tribal societies, by contrast, have always had a strong sense of the interconnectedness of things on this earth and beyond. For example, human beings have, for the greater part of the history of our species on this earth, lived by hunting and gathering. Yet peoples who lived by hunting and gathering did not—and do not to this day—consider themselves the lords of creation. On the contrary, they are more likely to believe in (and work hard to maintain) a kind of reciprocity between human beings and the species they are obliged to hunt for food.

The reciprocity between hunter and hunted is elaborately expressed in the ideas of the Makuna Indians of southeastern Colombia. The Makuna believe that human beings, animals, and all of nature are parts of the same One. Their ancestors were fish people who came ashore along the rivers and turned into people. Out of their bodies or by their actions these ancestors created everything in the world, the hills and forests, the animals and the people. They carved out river valleys by pushing their sacred musical instruments in front of them.

People, animals, and fish all share the same spiritual essence and so, the Makuna say, animals and fish live in their own communities, which are just like human communities. They have their chiefs, their shamans, their dance houses, birth houses, and "waking up houses" (places where they originally came into being as species). They have their songs and dances and their material possessions. Above all, animals and fish are just like humans because they wear ritual ornaments, consume spirit foods— coca, snuff, and the hallucinogenic brew called *yage*—and use the sacred *yurupari* instruments in their ceremonies. When shamans blow over coca, snuff, and other spirit foods during human ceremonies, they are offering them to the animal people. When human beings dance in this world, the shaman invites the animal people to dance in theirs. If humans do not dance and shamans do not offer spirit food to the animal people, the animals will die out and there will be no more game left in this world.

Thus when the fish are spawning, they are actually dancing in their birth houses. That is why it is particularly dangerous to eat fish that have been caught at the spawning places, for then one eats a person who is ceremonially painted and in full dance regalia. A human being who does this or enters a fish house by mistake will sicken and die, for his soul will be carried away to the houses of the fish people.

It is clear that Makuna beliefs have specific ecological consequences. The sacredness of salt licks and fish-spawning places, the careful reciprocity between humans and their fellow animals and fish, all mediated by respected shamans, guarantee that the Makuna manage their environment and do not plunder it. The Swedish anthropologist Kaj Arhem, an authority on the Makuna, describes their ecological practices and cosmological speculations as an "ecosophy," where the radical division between nature and culture, humans and animals—so characteristic of Western thought— dissolves.

Arhem suggests that we need an ecosophy of our own, imbued with moral commitment and emotional power, if we are to protect the resources on which we depend and ensure not only our own survival but also that of our fellow creatures on this earth.

We, on the other hand, tend to forget our environment except when we want to extract wealth from it or use it as the backdrop for a scenic expedition. Then we take what we want. There is no compact, none of the reciprocity so characteristic of tribal societies. For the most part we mine the earth and leave it, for we do not feel we belong to it. It belongs to us. This rootlessness and the waste that goes with it are particularly shocking to traditional societies.

The Indians of the western United States were outraged by the way in which the invaders of their territories squandered the resources that they themselves used so sparingly. The Indians on the plains lived off the buffalo, killing only as many as they needed and using every bit of the dead animals. They ate the meat, made tents and

clothes from the hides, and used the bones to make arrow straighteners, bows, mallets, even splints for setting fractures. They made butter from the marrow fat and cords from the sinews. When the white buffalo hunters came, it was more than an invasion. It was a sacrilege. These men slaughtered the herds with their powerful rifles, often taking only the tongue to eat and leaving the rest of the animal to rot.

The deep sadness of the Indians over this slaughter was expressed in a speech attributed to Chief Seattle, after whom the city of Seattle is named, believed to have been delivered in 1854 to an assembly of tribes preparing to sign away their lands under duress to the white man. Some contend the speech was actually written by a Texas speechwriter in 1971. Whatever their origin, these moving words convey an environmental and spiritual ethic that most tribal people share. They speak as much to us about our own predicament as they did to Chief Seattle's fellow chiefs about their defeated civilization. "What is man without the beasts?" he asked. "If all the beasts were gone, man would die from a great loneliness of spirit. For whatever happens to the beasts, soon happens to man. All things are connected. … We know that the white man does not understand our ways. One portion of the land is the same to him as the next, for he is a stranger who comes in the night and takes from the land whatever he needs. The earth is not his brother, but his enemy, and when he has conquered it, he moves on. He leaves his fathers' graves behind, and he does not care. He kidnaps the earth from his children. He does not care. His fathers' graves and his children's birthright are forgotten. He treats his mother, the earth, and his brother, the sky, as things to be bought, plundered, sold like sheep or bright beads. His appetite will devour the earth and leave behind only a desert."

Touching the Timeless

Modern society is intensely secular. Even those who regret this admit it. Social theorists tend to assume that modernization is itself a process of secularization that has not only undermined people's religious beliefs but has also deprived them of their spirituality. In the industrial nations of the West many of the people who believe in God do not expect to come into close contact with the divine, except after death—and some of them are not too sure about it even then.

Indeed, it seems that those who live in the secular and industrialized West are already searching for ways to fill the vacuum in their lives left by "organized" religion and the numbing delights of mass society. We live in a world that prides itself on its modernity yet is hungry for wholeness, hungry for meaning. At the same time it is a world that marginalizes the very impulses that might fill this void. The pilgrimage toward the divine, the openness to knowledge that transcends ordinary experience, the very idea of feeling at one with the universe are impulses we tolerate only at the fringes of our society.

It seems that we denigrate our capacity to dream and so condemn ourselves to live in a disenchanted world. Shorn of the knowledge that we are part of something greater than ourselves, we also lose the sense of responsibility that comes with it. It is this connectedness that tribal societies cherish. Yet for modern society, this is a bond we

cannot bring ourselves to seek. But if we do not listen to other traditions, do not even listen to our inner selves, then what will the future hold for our stunted and over-confident civilization?

The Tightrope of Power

Meanwhile, this civilization of ours, at once so powerful and so insecure, rolls like a juggernaut over societies that have explored the very solutions that might help us save ourselves. We do so in the name of progress, insisting all too often that we offer science, truth, plenty, and social order to peoples who lack these things. Yet the contrast between tribal societies and the centralized states that prey on them is not one of order and disorder, violence and peace. It is instead a contrast between societies in which no one has a monopoly on the legitimate use of force and others in which those rights are vested in a state. The 20th century has been one of the bloodiest in history, not only because of the wars between countries employing weapons of mass destruction but also because modern technology has been used by ruthless rulers to cow their own subjects. Hitler and Stalin are only the most notorious examples of dictators who directed violence against their own people in the name of the state. There are literally scores of shooting wars going on at the moment, most of them between states and their own subjects.

The state guarantees order, or is supposed to. Force, the monopoly of the government, is applied massively but, once the system is in place, relatively invisibly. Its victims are hidden in concentration camps or banished to Siberias. In many places today, the victims simply disappear.

It seems that people will often acquiesce in despotism for fear of anarchy. Recent history seems to indicate that the most advanced countries are more afraid of anarchy than they are of oppression. The Russians, whose whole history is a struggle to create order on the open steppes of Eurasia, have a fear of disorder (which they call *besporyadok*, the condition of not being "lined up") that has frequently led them to accept tyranny. At the other extreme, the United States, whose whole history is a determination to avoid despotism, allows more internal chaos than most other industrial nations. It values individual freedom to the point of allowing private citizens to own arsenals of weapons and puts up with a rate of interpersonal violence that would be considered catastrophic in other countries.

It seems that human beings are everywhere searching for the right balance between the mob and the dictator, between chaos and tyranny, between the individual and society. Industrial societies give a monopoly of power to the state in exchange for a guarantee of peace. We take this social order for granted to the extent that we tend to assume that there is anarchy and perpetual warfare in tribal societies. What we do not realize is that such societies are acutely conscious of the fragility of the social order and of the constant effort needed to maintain it. Paradoxically, the people who live in societies that do not have formal political institutions are more political than those who do since it is up to each individual to make sure that the system works, indeed to ensure that the system continues to exist at all. Tribal people avoid the perils of anarchy only through constant and unremitting effort.

Elijah Harper, an Ojibwa-Cree who is a member of parliament in the Canadian province of Manitoba, contrasted the democratic procedures of the native Canadians he represented with those of the Canadian government that was trying to push through a revision of Canada's constitution. The new constitution was designed to respond to Quebec's demand to be considered a distinct society within Canada, with appropriate protection for its own language and culture. Harper used parliamentary procedure to block the constitutional change, on the grounds that native Canadians had been asking for similar consideration for years without getting a hearing. A new round of discussions concerning the revision of Canada's constitution is now taking place and this time the rights of Canada's "first nations," the aboriginal peoples, are also on the agenda.

The Canadian crisis makes clear what is only dimly perceived in other countries, namely that the destiny of the majority in any state is intimately linked to the fate of its minorities. The failure of the first attempt to change their constitution has forced Canadians to think about what kind of society they want theirs to be. These are the same questions that the Aborigines are trying to put on the Australian agenda and that the Indians are forcing Brazilians to think about as they protest against the rape of Amazonian regions.

It is not only in authoritarian states that questions arise about how people within a state are allowed to go about their business. The dramatic events in Eastern Europe, however, have led some people to think so. Once the heavy hand of Communist dictatorship was lifted, the nations of Eastern Europe started to unravel. Old ethnic loyalties surfaced and ethnic rivalries threaten to dismember one nation after another. The problem in Eastern Europe is not that it is made up of more peoples than states, but rather that the states have not been successful in working out political solutions that could enable those peoples to live together amicably. But neither do democratic regimes find it easy to create more imaginative solutions that allow diverse groups of people to live together.

The reason for this failure is that such solutions require us to have a different idea of the state, a kind of new federalism, which, after the manner of the League of the Iroquois, permits each people in the nation to keep its council fire alight. This requires more than rules; it requires commitment. The Great Law of the Iroquois was remarkable because it was a constitution that had the force of a religion. People were willing, indeed eager, to subscribe to it because they saw it and revered it as the source of peace. Is it too much to hope that in a world riven with ethnic conflict we might search for political solutions more energetically than we have in the past? That we will not continue to expect strong states to iron out ethnicity, even if it means wiping out the "ethnics"? A new federalism is in our own interest, for it offers the hope of peace and the prospect of justice. Nations that trample on the rights of the weak are likely to end up trampling on everybody's rights. As we wring our hands over the fate of tribal peoples in the modern world, we would do well to remember John Donne's words: "Never send to know for whom the bell tolls; it tolls for thee."

Serious consideration of tribal ways of life should lead us to think carefully and critically about our own. What would it take for us to try to live in harmony with nature or to rehumanize our economic systems? How can we mediate between the

individual and the family, between genders and generations? Should we strive for a less fragmented view of physical reality or of our place in the scheme of things? These questions revolve around wholeness and harmony, around tolerance and pluralism. The answers are still emerging, but they too are variations on a grand theme that can be summed up in E.M. Forster's famous phrase: "Only connect." The project for the new millennium will be to re-energize civil society, the space between the state and the individual where those habits of the heart that socialize the individual and humanize the state flourish.

Consumption and Globalization

For a U.S. audience, this final section brings home the personal dimension of environmental choices, because we live in a consumer society. Akhil Gupta discussed the enormous difference between Indian and U.S. consumption patterns in Section 5. In comparison to the average Indian who consumes 2 kg of meat each year, U.S. residents eat 112 kg of meat. Beyond basic food necessities, Americans are preoccupied with having the right car, clothes, home, and electronics. People replace these items with changing fashions, often before they are worn out. These consumption patterns connect Americans to the exploitation of a vast array of the globe's resources (see also Redman in Section 3). For example, in this section, Brewster Kneen discusses some of the business and environmental practices through which Cargill, an agribusiness company, weaves together a global food system.

The article by Wilk connects earlier cultural ecology to the issues of globalization and consumer culture by discussing political ecology. Wilk argues that anthropology needs to consider consumption as the central ecological issue, one that is inherently global. Doing so draws ecological work into territory currently dominated by cultural studies.

How globalized is the world economy? We offer charts listing the dollar value of import and export figures for 13 of the countries profiled in this reader, as well as global trade. The figures cover 5 years during the mid-1990s, when trends toward globalization were purportedly increasing. A comparison of import and export figures will tell students the extent to which any single country is a net exporter or importer of goods. Large exports may not indicate economic growth if a country, in turn, is a heavy consumer of foreign goods. Not all countries fit into global trends in the same way, and we encourage students to debate the varied quality of global connections. This chart serves as this section's polemical piece. Curiously, given the fanfare surrounding globalization, it was difficult to find trustworthy numbers in a standardized currency that suggested the quality of global trade activities beyond raw export data. We settled here for data reported in the Central Intelligence Agency's annual fact book.

As Luke theorized in Section 5, the very concept of "globalization" requires imagining the world as a single entity—a notion not everyone shares. In contributions to this section, the authors take a few approaches to understanding the "globe" as an ecological entity and as a site of personal consumption. Caren Kaplan considers the production of these ideas through the marketing practices of The Body Shop, which link ecological health and personal well-being through marketing. Kaplan's analysis of The

Body Shop's use of travel in its advertising campaigns complements Martha Honey's assessment of ecotourism. Tourism is a multibillion dollar industry, structured to create an immediate experience of foreign cultures and environments. Martha Honey examines the ecological and social foundations of ecotourism in global settings.

Compared to the glamour of world travel, students may be surprised by the environmental prescription offered by Duane Elgin. In his ethical reflection, Elgin offers the radical idea that people could decline to consume. Time spent shopping might be spent on other endeavors, as people build their lives around principles and activities that require far fewer financial and environmental expenditures.

TABLE 1
Value of Imports and Exports 1992–1996 in billions of U.S. dollars

	IMPORTS					EXPORTS:				
	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996
Australia	37.8	37.8*	43	51.1	57.4	41.7	41.7*	44	50.4	51.57
Brazil	21	20	25.7	33.2	49.7	31.6	35	38.8	43.6	46.5
Cameroon	2.1	1.2	1.8	1.96	810m†	1.2	1.8	1.7	1.6	1.2
TB:Ecuador	1.95	2.4	2.5	3	3.7	2.9	3	3	3.3	4
Egypt	11.7	10	10.5	11.2	15.2	4.5	3.6	3.5	3.1	5.4
India	25.2	25.5	22	25.5	33.5	20.2	19.8	21.4	24.4	29.96
Lesotho	604m	805m	964m	964m*	1	59m	57m	109m	109m*	142m
Mexico	36.7	48.1	65.5	79.4	72	27.4	27.5	50.5	60.8	80
Philippines	12.3	14.5	17.1	21.3	26.5	8.7	9.8	11.1	13.4	17.4
Sierra Leone	146m	62m	131m	149m	150m	138m	75m	149m	149m	115m
U.K.	211.9	210.7	221.6	215	221.9	186.4	187.4	190.1	200	200.4
United States	499.4	544.1	582	664	751	428.1	442.3	449	513	578
Zimbabwe	1.6	1.8	1.8	1.8	1.8	1.8	1.5	1.5	1.8	2.2
World††	3.49	3.82	3.82*	4.1	4.4	3.34	3.64	3.64*	4	4.3

* As per original source, denotes replication of information from previous year when new figures were unavailable. All information in this and following figures drawn from the *World Factbook* published annually by the Central Intelligence Agency, Washington, D.C.
† Figures in millions of U.S. dollars denoted with 'm.'
†† Global figures are in trillions of dollars.

FIGURE 1
Imports in billions of U.S. dollars 1992–96
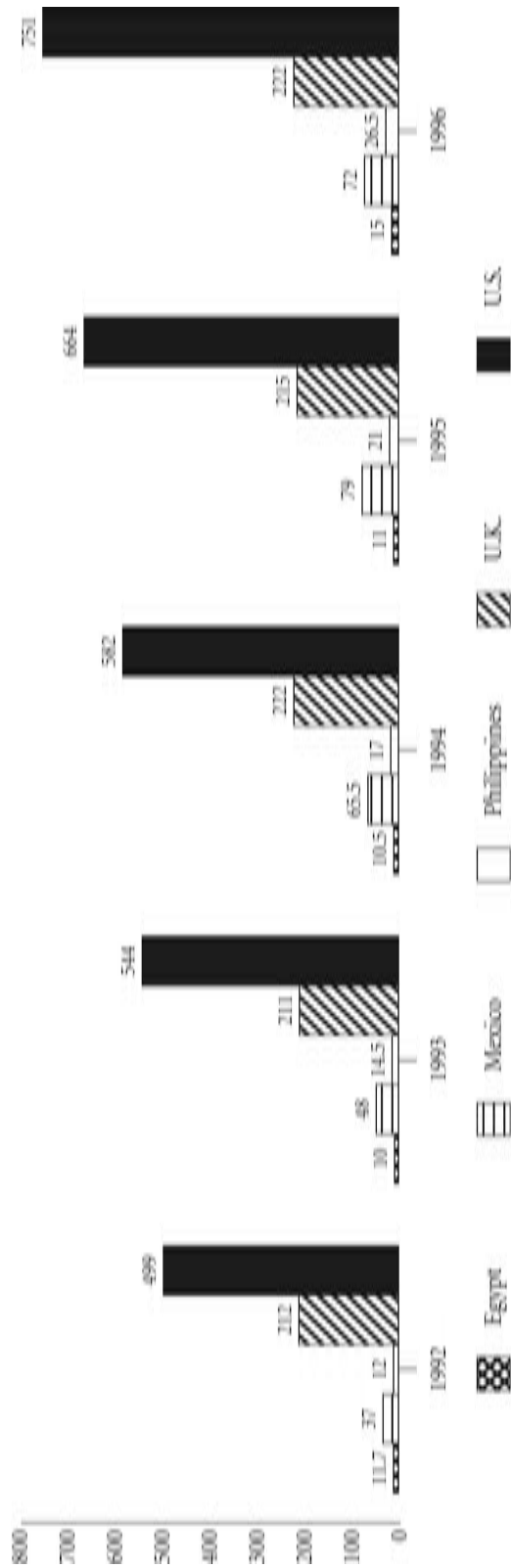
FIGURE 2
Exports in Billions of U.S. Dollars 1992–96
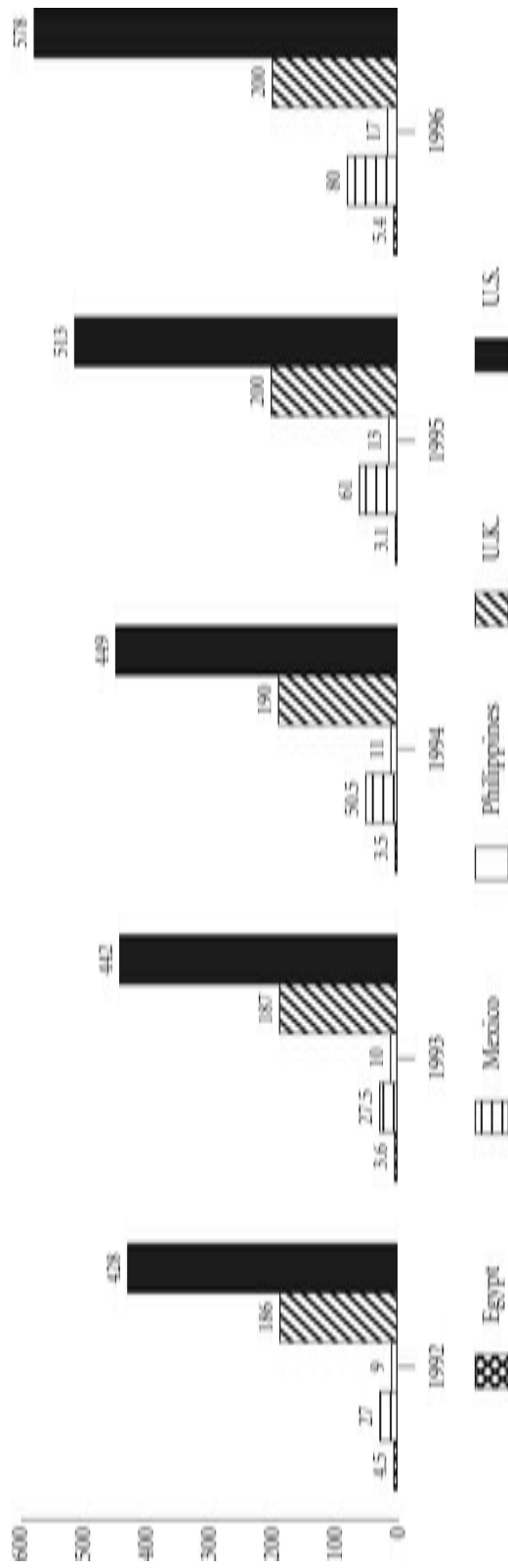
How Do We Know We Have Global Environmental Problems?

Science and the Globalization of Environmental Discourse

Peter J. Taylor and Frederick H. Buttel

Introduction

Since scientists a generation ago detected radioactive strontium in reindeer meat and linked DDT to the non-viability of bird eggs, science has had a central role in shaping what count as environmental problems. Over the last few years, environmental scientists and environmentalists have called attention, in particular, to analyses of carbon dioxide concentrations in polar ice, measurements of upper atmospheric ozone depletion, remote sensing assessments of tropical deforestation, and, most notably, projections of future temperature and precipitation changes drawn from computation-intensive atmospheric circulation models. This current coalition of environmental activism and 'planetary science' has stimulated a rapid rise in awareness and discussion of global environmental problems. A wave of natural and social scientific studies has followed on the effects of global environmental change on vegetation and wildlife, agriculture, world trade and national economic viability, and international security. We know we have global environmental problems because, in short, science documents the existing situation and ever tightens its predictions of future changes. Accordingly, science supplies the knowledge needed to stimulate and guide social-political action.

Science-centered environmentalism is, however, vulnerable to 'deconstruction'. Environmental problems, almost by definition, involve multiple, interacting causes, allowing scientists to question the definitions and procedures of other scientists, promote alternative explanations and cast doubt on the certainty of predictions. In turn, people trying to make or influence policy often find the lack of scientific closure a potent weapon (JASANOFF, 1992). After an initial honeymoon period during the late 1980s, global climate modeling, estimates of biodiversity loss, and other studies of the implications of environmental change have become subject to scientific and consequent political dispute.

The purpose of this paper is not to add our own assessment of the reliability of global environmental science or of the severity of the problems this science is indicating.

Instead, building on the sociology and social studies of science, we propose a different construction of the special relationship between environmental science and politics. The sociology and social study of science has, over the last 15 years, illuminated the social influences that shape what counts as scientific knowledge. Truth or falsity of the science is rarely sufficient to account for its acceptance, either within science or, as will be an equally important concern to us here, within the political realm. In this light we make three propositions, each confounding the first answer above to the question of how we know we have global environmental problems:

(1) In science, certain courses of action are facilitated over others, not just in the use or misuse of science, but in its very formulation—the problems chosen, categories used, relationships investigated, and confirming evidence required. Politics—in the sense of courses of social action pursued or promoted—are not merely stimulated by scientific findings; politics are *woven into* science at its 'upstream' end. In the case of environmental problems, we know they are global in part because scientists and political actors jointly construct them in global terms.

(2) In global environmental discourse, two allied views of politics—the moral and the technocratic—have been privileged. Both views of social action emphasize people's *common* interests in remedial environmental efforts while, at the same time, steering attention away from the difficult politics that result from differentiated social groups and nations having different interests in causing and alleviating environmental problems. We know we have global environmental problems, in part, because we act as if we are a unitary and not a differentiated 'we'.

(3) Global environmental change, simultaneously a scientific framework and a movement ideology, is particularly vulnerable to deconstruction. The point is not that appeals to common or universal interests are without efficacy as a political tactic (as, for example, human rights campaigns in times of severe repression demonstrate). Rather, inattention to the national and localized political and economic dynamics of socio-environmental change will ensure that scientists, both natural and social, and the environmentalists who invoke their findings will be continually surprised by the unpredicted conflicts and unlikely coalitions. To the extent that 'we' attempt to focus on global environmental problems, to stand above the formation of such coalitions and the conduct of such conflicts, 'we' are more likely to be spectators, rather than engaged participants in the shaping of our related, but different futures.

To explore these propositions, we will begin with a reconstruction and overview of the interwoven science and politics of *The Limits to Growth* (LTG) study of the 1970s. This case is convenient not only for reasons of demonstrating historical continuity; there is also a vast literature on the topic and a long span of experience by which to assess its consequences. Although the study should be familiar to most readers, we believe that our interpretation of the LTG is novel. From this beginning we then make extensions to current studies of the human/social impacts of climate change. Finally, we discuss the possible sources of deconstruction of the globalization of environmental discourse, affecting both environmental action and the planetary science upon which it draws.

Global Modeling, 1970s Style

The LTG study was funded by the Club of Rome, an elite group of Western businessmen, government leaders, and scientists, and was conducted by system dynamics (SD) modelers at MIT (MEADOWS *et al.*, 1972). The predictions from World 3, an SD model of the world's population, industry and resources were for population and economic collapse unless universal (coordinated, global-level) no-growth or steady-state policies were immediately established.

A major debate developed over the LTG study. Environmentalists applauded the attention the LTG drew to the finiteness of the Earth's resources, and the environmental movement took up notions such as finiteness of resources, 'economic growth vs the environment', growth control, and the steady-state economy as their major ideology and agenda. Economists, however, strongly criticized the LTG's pessimism. Scarcity, signalled in price changes, they contended, would stimulate technological advance and thus push back the limits of available resources. From a different vantage point, many leftists and social-justice-oriented progressives saw the LTG worldview as being insensitive to the needs of the poor and innocent of the realities of the penetration of multinational capital across the world. Others, particularly those skilled in the methodology of systems analysis, pointed to weaknesses in the model's empirical basis, structure and validation.

Despite the initial firestorm of criticism, the system dynamicists never conceded that their modeling was in error (MEADOWS *et al.*, 1973; BLOOMFIELD, 1986). After the heated reaction to the LTG, they adopted a lower profile, but continued to use SD in a wide variety of modeling and educational projects (e.g. FORRESTER, 1976), most notably in the explanation of broad modes of economic behavior—business cycles, inflation, and long waves (Kondratiev cycles). We can understand their continued belief in the validity of SD if we look more closely at construction of the LTG model of the world, noting that, whilst the system dynamicists were 'doing science', they were also constructing interventions in that world. Both the representation of how that world works and the interventions proposed for improving it made each other seem more real.

System dynamics, pioneered by Jay Forrester at MIT in the 1950s, was used first to model individual firms, then to explain urban decay and, by the end of the 1960s, to uncover the dynamics of the whole world. The origin of SD in the modeling of firms has significance for the subsequent applications. Managers with whom Forrester had talked (recall that the LTG model and its predecessor models were developed at the Sloan School of Management at MIT) had observed repeated cycles of running up inventories, then laying off workers, and then once again accumulating a backlog of orders, adding labor and increasing production, only to find themselves overcompensating and running up inventories again. Instead of attributing this cycle to the business cycle, Forrester concluded that the causes were endogenous to the firm. Each decision of management was rational but, when coupled together and incorporating the unavoidable time delays between setting a goal and fulfilling it, the overshoot-undershoot cycle resulted. Given that the undesirable behavior was caused by the interactions among different sectors of the firm, the firm's overall management could

overcome the cycling only if there were a superintending manager in a position to override the decisions of managers in the separate sectors of the firm. For example, the sector managers could be instructed to keep larger inventories and respond more slowly to changes in the backlog of orders than they would otherwise prefer to do.

SD for firms set the pattern for the subsequent urban, global and other SD models. In general, the modeler does not rely solely on recorded data, but instead invokes common-sense knowledge of how individuals work when they face a task with the usual information available. Computer games are often employed to convince players that they would not behave any differently from the people or other entities in the models (STERMAN, 1987). Building on this common-sense validation of the separate decisions, SD then demonstrates that these locally rational decisions, when worked through feedbacks in the system model, generate unanticipated and undesired or pathological, outcomes.

Using decision rules that look plausible to an individual, not only the LTG but almost all SD models exhibit undesirable cycles or positive-feedback-based exponential growth and collapse. These cycles are difficult to overcome by adjusting the parameter values, even if set as high as economic or technological optimists would like. SD modelers infer that this behavior is intrinsic to the structure of the system modeled, not in its detailed specifications. The actions of some individuals *within* the system cannot override the structure, even if those individuals understand the system as a whole. But in the case of the LTG 'world system', unlike in firms, there is no superintending manager to enforce the required interrelated changes in or at this world level. Catastrophe is thus inevitable unless 'everyone'—all people, all decision-makers, all nations—can be convinced to act in concert to change the basic structure of population and production growth. In this fashion SD models support either a moral response—everyone must change to avert catastrophe!—or a technocratic response—only a superintending agency able to analyze the system as a whole can direct the changes needed. There is no paradox here—moral and technocratic responses are alike in attempting to bypass the political terrain in which different groups experience problems differently and act accordingly. Forrester has argued that global questions, such as the 'feasibility' of continued growth of the world's population, capital stock and resource usage, require global models (FORRESTER, 1976; see also MEADOWS *et al.*, 1973, p. 238). When we examine, however, how events would develop if population growth proved 'infeasible', a politicized alternative to the LTG's diagnosis becomes apparent. Consider two hypothetical countries. Country A has a relatively equal land distribution; country B has a typical 1970s Central American land distribution: 2% of the people own 60% of the land; 70% own 2%. In other respects these countries are similar: they have the same amount of arable land, the same population, the same level of capital availability and scientific capacity, and the same population growth rate, say, 3%. If we follow through the calculations of rates of population growth, food production increase, levels of poverty, and the like, we find that five generations before anyone is malnourished in country A, all of the poorest 70% in country B already are. Food shortages linked to inequity in land distribution would be the likely level at which they, and by implication most of the world's population, would first experience 'population pressure'. Aggregation of the world's population and resources into the

LTG's global model obscured the fact that crises will not emerge according to a strictly global logic, much less in any global form as such.

This simple example does not tell us how to analyze the politics of localities, nations, regions, or a world in which people contribute differentially to environmental problems. Our point here is simply to highlight the political dimension excluded by the science of SD in its analysis of global limits to growth. The LTG's moral and technocratic emphasis is, of course, by no means a unique characteristic of their study. Our critique of the LTG's science-politics can be extended to the current globalization of environmental discourse. Before doing so, let us first say a little more about this moral-technocratic alliance that such discourse generally presupposes.

In technocratic formulations, objective, scientific and (typically) quantitative analyses are employed to identify the policies that society (in the case of the LTG, humanity) needs in order to restore order or ensure its sustainability or survival—policies to which individuals, citizens, and countries would then submit. In the LTG these policies are deduced from the model structure, which is held to reveal a dynamic that the ordinary citizen, politician, or businessperson would not have recognized or specified. Moral formulations, in contrast, reject coercion and rely on each individual making the change needed to maintain valued social or natural qualities of life. Yet, in many senses the moral and technocratic are allied. The solutions appeal to *common, undifferentiated* interests as a corrective to corrupt, self-serving, naive or scientifically ignorant governance. Moreover, appearances notwithstanding, special places in the proposed social transformations are reserved for their exponents—the technocrat as analyst/policy advisor; the moralist as guide (TAYLOR, 1988).

Revealingly, the LTG report at numerous junctures combined managerial language and moral recruitment: "Until the underlying structures of our socio-economic systems are thoroughly analyzed, they cannot be managed effectively" (MEADOWS *et al.*, 1972, p. 181); "The economic preferences of society are [to be] shifted more toward services" (p. 163); "We cannot say with certainty how much longer mankind can postpone initiating deliberate control of his growth" (p. 183); "The two missing ingredients are a realistic, long-term goal that can guide mankind … and the human will to achieve that goal" (p. 184). In short, the global society needs management to achieve control; mankind, like an individual person, needs a goal and a will to change.

Global Modeling Today

Global climate models—or, more precisely, general circulation models (GCMs) of the atmosphere—have, especially since the hot dry summer of 1988 in the United States, provided a new scientific basis for projections of imminent global environmental crisis. The actual modeling technique bears no similarity to system dynamics, but, the language of the LTG lives on. More importantly for our argument, the science of global environmental change continues to reflect, and in turn reinforce, the moral-technocratic formulation of global environmental problems. Two observations about contemporary research will serve to illustrate this point and to remind us of alternative formulations that, as in the LTG case, tend to be obscured by globalized discourse.

First, consider the high premium that is currently being placed on reducing uncertainty about physical processes in GCMs. To date, GCMs concur in predicting an average global warming, but the projected magnitude of the increase varies among the models. Moreover, at the level of regional predictions, larger uncertainties and inconsistencies among the GCMs are evident. Indirect climatic feedbacks, creating new uncertainty, have now been added to the research agenda (LASHOF, 1989).

Tightening long-term projections or highlighting their severity is not, however, the only means by which policy responses to climate change could be catalyzed. As GLANTZ (1988) has observed, extreme climate-related events, such as droughts, storms and floods, already elicit socio-political responses that can be relatively easily studied. Recent and historical cases of climatic-related 'natural hazards' shed light on the impact of different emergency plans, investment in infrastructure and its maintenance and reconstruction schemes. Policymakers, from the local level up, can learn 'by analogy' from experience and prepare for future crises. Instead of emphasizing the investigation of physical processes and waiting for uncertainty to be eliminated before action is taken from the top, this approach calls for systematic analysis of effective vs vulnerable institutional arrangements. Such discussion of specific, local responses to climate change is not absent. Nevertheless, the vast majority of funds for global change research is currently being devoted to improving GCMs and allied climatic studies.

This dominance of physical climate research over institutional analysis points to the second issue, the hierarchy of the physical over the life and social sciences. This hierarchy constitutes an environmental determinism: the physics and chemistry of climate change set the parameters for environmental and biological change; societies must then adjust as best they can to the change in their environment. The hierarchy is evident in the conceptual and temporal relationships of GCMs to other areas of environmental change research. GCM research is over two decades old. Building on the prominence given to GCMs in the late 1980s, a second tier or research arose which has generated scenarios of agricultural, vegetation and wildlife changes. This research models the interaction of projected temperature and precipitation changes with regional soils, watersheds, timing of snowmelts, wildfire susceptibility, coastal upwelling, and so on. Following shortly after, a third tier of research was added which has been devoted to assessing the economic or security consequences of these biotic changes or of the more direct consequences of climate change, such as a rise in sea-level. Modes of geopolitical response to the global climate change threat then began to be discussed by political scientists. Finally, and most recently, social scientists and humanists have begun investigating popular understanding of global climate change, furnishing the bottom rung on the ladder from the hard and physical down to the soft and personal.

Of course, global change researchers know that climate change is a social problem, since it is through industrial production, transport and electrical generation systems, and tropical deforestation that societies generate greenhouse gases. Nonetheless, it is *physical change*—the mechanical and inexorable greenhouse effect—that is invoked to promote policy responses and social change. Moreover, the research undertaken often belies the stated awareness of the social dimension of environmental problems. Natural scientists, HARTE *et al.* (1992), for example, recognize that "designing conservation

policies without considering the role of existing institutions or societal responses to climatic change will likely lead to failure". Yet the same authors advise that "models work best for predicting change when the important underlying [physical and biological] mechanisms are well understood". Natural scientists have benefitted from the prestige and funding that have flowed down from the high-status climate simulations, fueling their confidence that political affairs can be influenced by technical knowledge without (or prior to) analysis of existing social arrangements. HARTE *et al.*'s research reflects this sense of politics, not the earlier caveat.

Again, the physical-natural-social scientific hierarchy is not necessary in the construction of environmental problems. Over the last 15 years, fields such as geography, anthropology, and international development studies have become increasingly sophisticated at analyzing environmental change as *socio*-environmental change. Processes such as deforestation, drought, land degradation and migration of 'environmental refugees' are shown to be, in their causes and their effects, social and environmental at one and the same time (WATTS, 1983; BLAIKIE and BROOKFIELD, 1987). The social dynamics are most apparent on the economic level: resource distribution determines whether and *for whom* a bad year becomes a drought. Inequities in land tenure and rural political power ensure that the rural poor will exploit land vulnerable to erosion, migrate to carve new plots from the forest, or add to the margins of burgeoning cities well before the resources of their original locale are exhausted. Industrialization and other opportunities for off-farm income can result in insufficient labor remaining to keep up traditional conservation practices. Such economic observations readily lead us to consider local particularity and historical contingency—in some areas traditional practices have resisted disruption by linkage into global markets and have instead contributed to environmental sustainability, while in other areas social organization has been rapidly restructured with significant environmental consequences (LITTLE, 1987; RICHARDS, 1985).

Sites of 'Deconstruction' of Global Environmental Change

In highlighting the moral-technocratic construction of global environmental problems, we hope to steer the attention of scientists and environmentalists towards the differentiated politics and economics of socio-environmental change. There are, of course, other sources of opposition to global and political formulations of environmental issues which threaten to render global environment discourse, like science-centered environmentalism in general, vulnerable to deconstruction. In this section we review some major places where globalization is disputed. Most of this opposition, it should be noted, centers more on disparities among nations than on the differentiated economic and political conditions within nations—a particular construction in its own right.

Global change knowledge was appropriated within the environmental activist community and employed to mobilize support for the movement's goals. The selective promotion of global change/warming increased support among prospective environmental supporters, and minimized opposition among the political and corporate

officialdoms in the advanced industrial countries. The popularization of the global warming notion was accompanied by, if not substantially based on, disproportionate stress on Third World sources of greenhouse gases, particularly tropical rainforest destruction. Tropical rainforest destruction probably accounts for less than 15% of global greenhouse gases and is a relatively minor source compared with industrial, transport, and other greenhouse gas emissions from the developed countries. The 'rainforest connection' has, however, been central in the scientific and popular construction of global change knowledge. At the level of environmental science, it has led to greater stress on the conservation biology of rainforest biodiversity, not only as a subordinate theme within the global environmental change framework, but also as a glamour topic in its own right.

As awareness of global climate change and the biodiversity implications of rainforest destruction grew in tandem, environmentalists came to focus the bulk of their efforts at two interrelated levels: on one hand, considerable activity was focused on the UN System (particularly UNEP) and other 'international regimes' in order to forge international conventions on climate change, biodiversity, and forest management (which were under investigation in preparation for a hoped-for ratification at the 1992 UN-sponsored 'Earth Summit' in Rio de Janeiro); on the other, environmental groups have sought to influence, and to employ the influence of, the international development finance and assistance establishment, particularly the World Bank/IMF, because of the important role of these institutions in affecting economic activity in the tropics. Within both of these fora, as well as among the international development intelligentsia and NGOs, environmental groups have played an important role in shaping understandings and policies with regard to 'sustainable development'. In particular, there is a very strong stress on rainforest environments and biodiversity in sustainable development doctrine.

The rise of global-change–led international environmentalism occurred during a significant shift of the political center of gravity of the industrial world toward neo-conservative regimes. Modern environmentalism has accommodated itself surprisingly readily to the global free-market resurgence. While international environmental groups yet reserve the right to criticize the World Bank and related institutions about the environmental destruction that results *from particular projects or types of projects* (especially dam and road construction and mining projects), environmental groups have generally worked with the Bank/IMF in a surprisingly harmonious manner in implementing conservation/preservation policies and programs in the Third World. There is a key coincidence of interest in the environmental group/World Bank/IMF relationship: the Bank and IMF gain legitimacy in the eyes of the citizens and political officialdoms of the advanced (increasingly 'green'-oriented) countries by helping to implement environmental and conservation policies, while the implied threat of Bank or IMF termination of bridging, adjustment, and project loans is useful in securing developing-country compliance with environmental initiatives. Given this relationship, most environmental organizations have been disinclined to take on the world debt crisis, the net South-North capital drain, and the international monetary order (which is substantially regulated by the World Bank and IMF; WOOD, 1986) as being fundamental contributors to environmental degradation.

The political economy of debt in the overall context of a stagnant world economy has become the principal parameter affecting both Third World development prospects and its environmental performance. It has largely been through the 'debt regime' that environmental agendas have been grafted onto Third World development planning. Only heavily-indebted countries, for example, have debt that is sufficiently discounted on the secondary debt market to be attractive to environmental groups for purchase in debt-for-nature swaps. Likewise, heavily-indebted countries are most subject to joint environmental group and development agency pressures to protect the environment. But as much as external debt has facilitated the implementation of environmental conservation policies, debt also serves to *exacerbate* environmental degradation. Third World countries that are most 'debt-stressed', and thus which are most in need of hard-currency export revenues, are most likely to see little alternative but to aggressively 'develop' their tropical rainforests and other sensitive habitats in order to maintain their balance of payments and service their debts. Environmental activism through the debt regime is thus likely to be a standoff: two steps forward, and one or two steps back.

Given these political and economic conditions, it is not surprising that a strong force for deconstruction of global change/discourse is that of the growing Third World reaction to 'environmental colonialism'. Developing-country opposition to international environmental regulation is increasingly seen as being likely to frustrate, if not prevent, the appearance or reality of meaningful international environmental conventions. This Third World reaction is surprisingly broadly based. Growing quarters of the Third World intelligentsia and the NGO community stress, for example, that international environmental organizations have exaggerated the Third World contribution to global warming, and that Western calculations of developing-country contributions to greenhouse gas emissions have failed to note a fundamental First World/Third World difference in the nature of these emissions: that between the 'survival emissions' of the South and the 'luxury emissions' of the North. But Third World criticism of global environmental regulation policies as 'environmental colonialism' also includes increasingly forceful opposition by Third World politicians and business leaders to proposed global change conventions on the grounds of their being an unjust violation of 'national sovereignty' (PEARCE, 1991). As the Earth Summit drew near, there were strong indications that it would be dominated by North-South acrimony as much as by environmental science.

Deconstruction of the science and the action program of global climate change is by no means confined to dissenting Third World voices or to those who speak for the interests of the world's poor. Spurred by contrary evidence within Western planetary science, dissent on the part of the propertied and powerful has also been expressed, e.g. the Bush Administration in the U.S.A. has largely remained a bulwark against rushing into a global climate change convention, invoking the lack of conclusive scientific evidence that there will be significant global warming, to justify their position.

Conclusion

The current globalization of environmental discourse, like the LTG debate in the 1970s, steers attention away from the differentiated politics and economics of socio-environmental change. As should be evident from this commentary we believe both the science and politics involving environmental change would benefit from a reversal of this trend. In drawing attention to the moral-technocratic construction of global environmental problems, we have also been promoting a sociological perspective on science, namely that interpretations and action, both scientific and social, are bound together, jointly reinforced by the formulation of problems, the tools available, the audiences being addressed and enlisted to act, the support (financial and otherwise) elicited, and so on. It follows that any reconstruction of science and politics must be a multi-faceted process drawing upon many more strands than simply a reconceptualization such as ours of the relationship between the knowledge claims and views about desirable social action. Nevertheless, the critical perspectives we have introduced allow us to anticipate some ways in which global environmental discourse, although powerful, remains vulnerable to dispute and open to transformation.

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The Ecology of Global Consumer Culture

Richard R. Wilk

Introduction

"Ecology" is not a word often associated with consumer culture. The worlds of shopping, fashion, and Hip Hop music seem far distant from problems of habitat destruction and pollution. But in this article I argue that these are not two separate issues, but a single one. Everything we buy, wear, eat, and drive connects us in some way to the natural environment through long chains of connections. And today those connections span the globe, so the things we consume may have traveled through several countries as they make their way from places they are produced and processed to our tables and closets. In modern industrial societies, we are all global consumers, and our choices, tastes, and desires have direct effects on people and environments all around the globe.

"Global" has become one of the key millennial buzzwords, and it is often used in a vague way that actually obscures key connections. As multinational corporations re-label themselves as "global enterprise solutions," academics are also inserting these trendy syllables into almost every conceivable discipline and context, producing an inexorable stream of slogans, monographs, and verbiage that threatens, like a lava flow, to bury all the old territory it passes over.[1] Anthropologists have several good reasons to stand aside and let the flood of global theory pass them by. Our experience with earlier models of global cultural change have not been particularly happy, from the unilineal evolutionism of the 19th century, through various forms of functionalism, into modernization and development theories. The spate of recent writing about globalization offers many reasons for caution. Beneath the trendy talk lurk a host of old outmoded dichotomies, dire predictions, and alarmist rants about the end of culture, or nature, or life as we know it (see Greider 1997, or Barber 1995). "Global" often turns out to mean "modern" or "western," technology is the prime mover, acculturation or ethnocide the main process, and the result will be the passing or the resurgence of traditional culture.

Some anthropologists who write about globalization downplay radical social change, and argue instead that global goods and images are domesticated and appropriated in each place. Local cultures will persist because they can absorb foreign ideas

and practices into their own system. A good example of this calm voice for the local is provided by James Watson's collection "Golden Arches East" (1997). Though McDonalds may be a global economic leviathan, we are told, it is also localized and appropriated into local culture everywhere. Other anthropologists assert that cultural trends that appear to be part of globalization are actually the result of long-term trends in an existing capitalist world system (e.g. Friedman 1994, Dirlik 1996). Still others raise methodological and empirical questions. Do we have the appropriate tools and concepts to even think about new global cultural phenomena? How does one study transnational and global processes? Are we even theoretically sophisticated enough to ask the right questions or gather the right data? (Wolf 1996).

Despite all these problems, I think it is worthwhile, even vitally important, for environmental anthropologists to engage with globalization. Ecologists, climatologists, and a host of other natural scientists are arguing forcefully that today's most serious environmental problems are inherently transnational, transboundary, multilateral, and multilevel (Puntenney 1995). If anthropologists are going to help solve key global environmental problems, we have to find ways to link levels of analysis upwards and outwards, instead of constantly taking refuge in the local settings where we do so much of our fieldwork (Kottak and Colson 1994). There is no place left on the planet where the impacts of global environmental, economic, and cultural forces are diminishing. Interdependence and integration are a fact. So, what would a global cultural ecology look like? The traditional avenues towards a greater integration of anthropological knowledge have been theoretical projects where people find unifying models of human behavior in universal properties of mind, biology, or culture. The notion of recurring functional regularities, and causal linkage between levels of analysis is particularly important in ecological anthropology. These ideas build on earlier forms of functionalism and on biological ecology and systems theory. Yet in the discipline as a whole, and within ecological anthropology, this work founders on a host of fundamental disagreements about human nature, the epistemology and politics of science, and the comparative method (Wilk 1996). While ecological anthropologists have generated many robust mid-level generalizations about the ways human ecosystems work (e.g. Netting 1993), most do not address the institutional and political complexity typical of global ecological problems. As Rappaport argued, the key to an anthropological contribution to global ecological issues is to find a way to include "both the 'microanthropology' of ethnography … [and] also the 'macroanthropology' of approaches such as world system theory, linkage theory, and the theory of adaptive structures" (1995:1).

One promising line for pursuing this integration is the exploration of institutional links, which connect many different constituencies, policymakers, and communities in processes affecting the environment. In response to the ways that environmental problems cross international and regional boundaries, Puntenney suggests, anthropologists should focus on the political and institutional relationships between the actors and groups responsible for both exploiting and managing ecosystems (1995). Yet, even in her own edited collection on anthropology and global ecosystems, most authors are thoroughly grounded in local situations. Global phenomena enter the picture when they take the form of new approaches to environmental management,

heightened recognition of environmental problems, the spread of ideas about sustainability, and trends towards co-management and local empowerment. None of the authors address the many kinds of production, marketing, and consumption that are so conspicuously transforming the local areas where they work. Globalization does not always follow institutional "official" channels and linkages, and indeed some theorists argue that conventional policy-making and development institutions are becoming irrelevant.

An early proponent of Political Ecology, Eric Wolf argued that "new forms of flexible capitalism" (1996:41) are the moving force behind increasing global flows of material and information. These flows are in turn critical to understanding local development and environmental change. Following Wolf, an adequate cultural ecology must include the history of global markets and politics, the global spread of cultural knowledge and artifacts, and the networks of finance, intergovernmental agencies, trade, migration, and domination, which now directly affect even the most isolated ecosystems on the planet. Building a global cultural ecology requires expeditions into territories of analysis that have been dominated by other disciplines for a long time.

Giving greater importance to global connections does not mean abandoning the local study of peoples intimate relationships with land and resources. The key is to find better ways to link specificities and generalities, to recognize systematic connections between the localities where we work, each with its own history and culture. Consumer culture provides one avenue towards forging these connections. During the last 500 years every part of the world has started to participate fully in a system where manufactured commodities have gradually replaced all kinds of objects and goods that were once provided by household and community economies. And almost everywhere people have begun to discover new needs for myriad goods and services, some as simple as metal pots and flashlights, and others as complex as cellular phones. This process leads to growing dependence on a cash economy and market connections, and a progressive shrinking of self-provisioning, a key hallmark of mass consumer culture. I suggest that the growth in human needs, particularly needs for increased levels of consumption of energy and goods, is a general process which has its own special dynamic, providing a means to make general sense out of many specific cases. Cultural ecology needs to incorporate the concept of consumer culture, if it is to make sense out of the environmental challenges of the next century.

Consumption as a Global and Local Ecological Issue

Consumption has been a key issue at every recent world conference on environmental issues and global climate change. All parties agree that the affluence of the North has been based on the consumption of huge quantities of non-renewable resources, and the consequent emission of equally vast quantities of waste. The fairness of different solutions to environmental problems is debated largely through a framework that connects wealth with high rates of consumption and greater ecological impact. Policymakers disagree about how these variables are related to each other and who will pay the price of change. Why should poor countries restrain their own growth to save

the environment, when rich countries are responsible for so much more of the damage the planet has suffered? Is it possible to have prosperity and economic growth without massive ecological consequences (Timmerman 1996:228)? The close relationship between consumption and sustainability of global environments is recognized in the Agenda 21 agreement.[2]

Global inequalities in levels of resource consumption are striking. Kennedy (1993) estimates that an average American baby at birth represents 280 times the environmental damage of a Haitian or Chadian baby. Every day a North American consumes 30 to 50 times more energy and materials than a person living in a low-income country like Honduras. Emissions of greenhouse gasses like carbon dioxide, responsible for changing the global climate, are also very uneven. North American CO_2 emissions are 5 tons per capita, compared to .19 tons per capita in southeast and south Asia (OECD 1997a, Redclift 1996). Yet while consumption is increasingly identified as a key component of global environmental problems, people do not agree on what forces are driving high levels of consumption, or what we could do to persuade or force people to limit their consumption (OECD 1997b, NRC 1997).[3]

At the global level over-consumption is an obvious problem, but it remains abstract and hard to tell apart from concepts like affluence or "standard of living." Do wealth and high consumption always go together? (The best answer seems to be, *not necessarily.*) Does an increased level of consumption make people happier? (Scitovsky [1992] says it makes them *less* happy.) Are human needs and wants infinite, or are there limits? (Nobody seems to know.)

Exactly the same problems crop up at the micro-level of ethnographic analysis of particular places and times. To make this point I return to fieldwork I did with Kekchi Maya swidden farmers in southern Belize from 1979 to 1981.[4] My goal is to show that issues of consumption are essential for understanding environmental change at all scales of analysis. And anthropologists, particularly cultural ecologists, already have many of the analytical tools needed to make sense out of consumption.

The Kekchi are tropical rainforest farmers. About 5,000 live in 30 villages scattered across a relatively isolated district which still supports large areas of primary and secondary forest. They hunt, fish, gather food and other wild resources, raise livestock, and grow a mixture of subsistence and cash crops. Some jobs are available in a nearby town and on some larger farms, and there are a number of small enterprises including retail shops, ecotourism lodges, trucking businesses, crafts, and other services.

I designed my study along the standard models of 1970s cultural ecology. I concentrated on the connections between the Kekchi swidden farming system and the social organization of households and communities. In particular I wanted to show how increasing population and intensification of agriculture led to changes in the domestic organization of labor and property, which in turn affected household formation and settlement patterns. But under the influence of Robert Netting, my dissertation advisor, my study considered broader aspects of politics, history, and the economic system. Instead of writing a study of purely local adaptations to an environment, I showed how hundreds of years of conquest, political domination, and shifting periods of "economic development" had been crucial in shaping Kekchi ecological relationships.

In writing about the Kekchi, I found it easy to fall into classic stereotypes. One was the story of functional adaptation—that the Kekchi were wise and crafty, finding clever and subtle ways to deal with risk, maximize their returns, and evade the manipulation of capitalists and governments. A second was the drama of victimization, as they were repeatedly driven off their land, drawn into capitalist farming (only to be dumped by fickle markets), missionized, taxed, regulated, and oppressed, then divided and set against each other. These are very conventional portraits of peasants and farmers in the ethnography of the last twenty years.

At the same time I saw many things that contradicted the stereotypes, and it took me years to fit them together in a way which made sense. One problem I noticed early on was that Kekchi people were not generally interested in talking about farming, land, or politics. What fascinated them endlessly were tools, gadgets, and consumer goods of all kinds. Hundreds of times a day people asked me about the prices and origins of the clothes I wore, my compass, watch, pencils, typewriter, glasses, lantern, and radio. On weekends people from the village would pay a substantial sum to travel into town. They could have saved the bus fare and bought what they needed in local shops, but they really enjoyed looking at things in shop windows, and on their return they would talk at great length about the prices and origins of different goods.

When I started to work out figures on labor use and yield in different crops, it became clear that a lot of families were cutting down on corn production for household use, and expanding their cash cropping. This forced many to buy imported foods from local shops at inflated prices. Older people lamented the shift away from home production of foods and crafts, and the growing dependence on things from stores. But even the oldest and poorest had long since given up making their own pottery and sugar, and everyone used flashlights, kerosene lamps, metal pots, laundry soap, and plastic dishes. While many households still grew their own coffee, or traded for it with neighbors, everyone considered Nescafe a superior drink, something to serve guests or to save for special occasions. Young men, still living with their parents, were particularly avid cash-crop producers, and they were the most likely to spend money on clothing, musical instruments, watches, liquor, cigarettes, and jewelry. Meanwhile their sisters would wring every penny they could from selling eggs or small crafts to buy cosmetics, jewelry, and clothes. Mature families with a number of older working children bought the village's "big-ticket" items, including corrugated iron roofing for a small shop, a bicycle, horse, radio, cement for flooring, or a chainsaw. Some people dreamed of owning a motorbike or a used pickup, or of sending their children to high school.[5]

From an ecological standpoint, some of this consumer behavior could be seen (with some stretch) as adaptive, as making ecological sense. Facing similar sorts of behavior in Amazonia, for example, Gross et. al. (1979) claim that the new tools are more efficient, and that the jewelry, watches, and guns are the best way to store money when banks and other investments are absent. This form of functional explanation is closely related to generations of economic anthropology that explain most kinds of conspicuous and luxury consumption as rational competition for "status" or as a latent means of leveling out surplus (or confusingly both at the same time). Researchers rarely thought about other ways of spending that could make much better ecological

sense. The goal seems to be to find good reasons why people might devote such great time and energy to acquiring objects which make little overt contribution to their survival, or the provision of their basic needs. As long as everyone in a society is producing enough to survive, anthropologists could treat the consumption of "status" or "symbolic" objects as customary or political. Potlatches and other competitive consumption of wealth could be seen as evidence that many societies was not functionally stable in pre-capitalist times (Edgerton 1992). What if a large part of the population was deprived of basic necessities, or enslaved, physically sacrificed, or killed in battle as a direct consequence of providing "luxuries" for someone else? How is that functional and adaptive for society as a whole?

These questions are not as far from the Kekchi case as it might seem. During my fieldwork I saw mothers selling the eggs from their family's chickens, to get money for Coca-Cola and candy, while their children clearly needed protein more than sugar. I saw men sell pigs to raise money to buy a boom box or a carton of cigarettes. The same money could have helped send their kids to school, or build a latrine, or improve their corn storage, or plant some cocoa trees. I was dismayed by these choices, but coming from such a wealthy consumerist society, how could I say that it was wrong to want better clothes, a cold beer now and then, or some nice recorded music?[6]

Kekchi families did not all approach consumer goods in the same way. Many people moved from village to village in response to both the costs and opportunities of participating in the cash/consumption economy. Some families moved towards roads, where it was easier to get to town, sell crops, find wage work, and buy goods. In Belizean English people described life near the road as "bright." This life also had its drawbacks. There was more competition for land, less cooperation between neighbors, and more crime and physical danger. Most important, the roadside villagers told me, was that people came to depend more and more on buying things, so that they needed money for everything.

Roadside life did not appeal to everyone. A surprising number of families moved in the opposite direction, or spent some time by the road and then went back "to the bush." Life in the villages away from the roads was "peaceful" and more secure. Anyone who was willing to work hard could feed their family. People might go to town once or twice a year. In the village they avoided the prying eyes of government officials and depended on each other. The cost of this freedom was poor access to health care and education, and very limited access to the market.[7] People could still live largely outside the market economy, if they were willing. The question for me was why so many people were not willing.

A historical note is needed here. It is very easy to fall into the trap of depicting the commoditization of Kekchi culture as a linear process. There are many accounts of how the "ancient and primeval" self-sufficient subsistence economy is now disappearing under the flood of modernization and market. But historical documents show that Kekchi people have moved back and forth across a whole range of mixed economies since the 16th-century conquest of their homeland. Many Kekchi have been urban town dwellers since before the conquest, and the shifting tides of peripheral capitalism have brought many waves of commoditization to the countryside. (The question of how people decommodify their lives during recession and depression

deserves study in itself). Nevertheless, it is fair to say that the sheer variety and amount of consumer goods and purchased items circulating in the Kekchi economy is much higher today than at any time in the past. I would expect to find this true in virtually every part of the world. Where once anthropologists found a material culture of bicycles, kerosene lamps, metal cook pots, laundry soap, and plastic jugs, they now find a proliferation of goods from kitchen blenders and electric irons, to gold jewelry, Avon products, and satellite television.

Any conventional cultural ecological analysis runs afoul of this change, because a functional analysis of "the system" requires some idea of what an average family "needs" to get through the year. To say that people have 'adapted' in the sense used by cultural ecologists, we must have a standard of living against which to measure resource use. Then, any idea about balance depends on what inputs are required to keep the system going. In my Kekchi research I thought that opening up "the system" to history and the effects of roads, markets, and the politics of land and resource management would be enough to contextualize the local ecology. But I found that the Kekchi way of life was not changing in direct response to population pressure, the encroachment of corporate farms, or government administrative policies. These are the classic destabilizing influences found in development studies (Wilk 1997b). Instead the key change in the Kekchi ecological system was a transformation in Kekchi "basic needs." What were once unobtainable luxuries had come to be considered necessities of life. Even in the most remote villages, nobody would think of making their own sugar or growing their own tobacco any more. In the cycle observed innumerable times over the last thousand years, wants had become needs, and new wants were appearing all the time (Illich 1977). Without consensus on how much a family needs a year, how can we model the amount of secondary forest a village needs to clear, or what population is sustainable given the existing resources? It turns out that at the micro-level of the community, we find exactly the same problem that plagues the global theorists. Needs keep expanding, and there is no consensus on what levels of consumption are appropriate, sustainable, or equitable.

Perhaps the most fundamental cultural change I have seen among Kekchi people has been that as commodities have become a larger part of their lives, they have come to believe themselves to be *poor*. In 1979 I spent a week trying to find a Kekchi translation of the words "rich" and "poor." Older men explained to me that the closest word was "*tok'ob ru*," which translated best as "misfortunate," people deserving of pity because they were sick or had lost close relatives. When I explained I was looking for a word that described a person who had few possessions, not enough food, a small house, and no respect from neighbors, the word they gave me meant "lazy." They explained that the only reason why people would live so badly was that they did not want to work, or maybe they were sick, had bad luck, or had been bewitched. Most Kekchi had no sense that they lacked basic necessities or lived an inferior lifestyle.

Twenty years later, it is common to hear Kekchi people state in public that "we Indians are poor because the government neglects us," or because they are robbed by foreign logging companies, or otherwise discriminated against in schools, in courts, and in jobs. All of these are objectively true. But in another sense it is very sad to see

people accepting, even rhetorically, a foreign definition of poverty measured in cash and consumer goods, because this definition implicitly devalues Kekchi culture and self-reliance.

Other Approaches to Consumer Culture

Anthropology belatedly took on the problem of consumer culture during the 1980s, though economic anthropologists had made some earlier efforts in that direction. Now we have abundant theories and studies of consumer culture in many parts of the world (see Miller 1995a, 1995b). Theories of consumption tend to revolve around three poles; consumption as utility, as identity, or as symbolic social competition. Carrier and Heyman point out in a recent survey that most of this work is "synchronic and psycho-cultural," that it largely ignores political economy (1997:355). While there has been a recent spate of ethnographies that focus on consumer goods in different cultural settings, there is little comparative work that tries to make any overall sense of how and why people develop new needs and tastes. The answer to these questions depends largely on the presupposed model of human nature which the investigator starts with (Wilk 1998, 1996).

This is not to say that we know nothing about what impels or constrains the development and expression of needs in different cultures. Much of classical economic anthropology can be read as accounts of how different cultures have limited and controlled needs, to channel or restrict competition within accepted social boundaries. Godelier's work on Baruya of New Guinea, for example, argues that social rules and ritual keep people from converting different kinds of goods into each other, or into political power, keeping competition within narrow boundaries. A "great gardener" by definition cannot exchange his surplus for trade goods or use it to develop a political following (1986). Economic anthropology also offers insights into the operation of envy, fear of envy, and witchcraft, in restraining consumption through means often lumped under terms like "image of limited good," or "leveling mechanisms."

Anthropologists have also provided examples of the ways that social competition can drive all kinds of excesses in accumulation and consumption of goods. Bring large quantities of cheap manufactured goods into an existing competitive feasting system, as in the Potlatch system of the Northwest coast in the early 20th century, and the results can be spectacular. More often, there is a gradual and quiet process of growth in the number and kinds of goods that people consider necessary. This more subtle process has largely been ignored by anthropologists. Understanding it will require long-term comparative data and ethnographic work. Because spending, allocation and consumption are intimate issues in many cultures, detailed and close observation of many domestic contexts is required. At the same time, all consumption is informed by life goals, cosmology, religion, and social priorities that require broad cultural analysis. Finally, we need to develop a comparative framework for understanding stages of development in consumer culture, types of consumer culture, and varieties of trajectories of change, that can make meaningful sense out of a variety of ethnographic and historical cases. This is a formidable task, but given the key importance of

the issues of consumption for every kind of environmental problem, we should not delay getting started.

Conclusions

Eric Wolf, Robert Netting, John Bennett, and others have argued for a cultural ecology that places politics, history, and cultural systems of meaning at the center instead of the margins. So far, this promise has not been fully realized. In practice, political and social issues tend to be included only when they directly affect resource use in a visible way, as when politicians appoint resource managers and set environmental policy. Applied cultural ecology has tended to consider ideology and cultural meaning to be a kind of justifying discourse or vague set of public values, ideas which make certain problems thinkable. I suggest that there are other important aspects of culture that also need to be included in modern environmental anthropology. Culturally defined sets of needs and standards of living, and the social processes that generate and mediate those needs, are central to understanding both local ecological relationships, and the general priorities that drive national and global ecological and economic policies. We need to keep our attention on the kinds of goals and values that drive economies, recognizing that even for very poor people, life is more than producing an adequate supply of calories and protein.

There are of course many places in the world where rural people face declining standards of living, ruined environments, increasing levels of exploitation, conflict, and misery. In the same societies, however, new middle classes pursue the "good life," building new towns and suburbs filled with appliances and other new products. The consumers and the destitute are indeed part of the same phenomenon, tied together in a single system, with equally important impacts on the natural environment. And even among the victims, we should recognize that rising levels of discontent, as well as pressures on resources, may be due as much to increased "standards of living," greater expectations, as well as population growth, or absolute economic decline.

I am not suggesting that the legitimate aspirations of rural people to improved water, medical care, or diet should be seen as somehow "to blame" for ecological problems (though I have heard this in unguarded moments from government officials and development workers). But what aspirations are legitimate? A bicycle? A few beers every week? A car for every Chinese peasant? A gallon of beer a day?[8] We have to recognize that the basic ethical and moral problems of peoples' economic goals are a part of political ecology. We cannot say we trust rural people to make their own choices and choose their own path, but then change our minds when their choice ends up being spending their money on cigarettes instead of integrated pest management. As environmental activists in many countries now recognize, questioning the meaning of the "good life," and helping people recognize the environmental costs of their consumption are important steps towards sustainability. In many countries, particularly in Europe, there is now discussion of how government policies and regulations can be changed to help limit, channel, and promote more sustainable forms of consumption. I hope that environmental anthropologists will find ways to join in these kinds of debates.

NOTES

1. On the excesses of "globalism" see cautionary tales from Miller (1997), Wilk (1995), and Abu-Lughod (1997). The strongest proponents of global transformation may be Appadurai and Hannerz though each temper their statements with a strong appreciation for the continuity of local social relations and cultural boundaries. Morley and Robbins (1995) provide an excellent and moderate summary of developments in global media and communications. My "global-babble" webpage is at http::www.indiana.edu/~wanthro/babble.htm.

2. Here is an example of the kinds of insights many derived from the Rio conference: "Paradoxically, the North is viewed as more conscious and respectful of environmental limits than is the South, when all available evidence shows that the environmental crisis has been precipitated almost exclusively by the North's wasteful and excessive consumption. Indeed, roughly 80% of the planet's resources, as well as its sinks, are being utilized by the 20% of the population living in Europe, North America, Oceania, and Japan. If the South disappeared tomorrow, the environmental crisis would be still with us, but not if the North disappeared." Banuri 1993:51.

3. It is somewhat ironic that at the same time that policymakers have identified the ever-growing needs of consumers as a "problem," many consumers have started to join various kinds of voluntary simplicity movements, and there is a proliferation of anti-consumer publications, groups, and foundations.

4. In Guatemala the orthography "Q'eqchi" is now preferred, while various different spellings are in use in Belize. My monograph on Kekchi agriculture and households is Wilk 1997a; there are also several papers addressing different aspects of Kekchi consumption, particularly houses (Wilk 1989).

5. Remember that this was in 1980. In the early 1980s many Kekchi villages made a lot of money growing marijuana, and others expanded into cacao and other then-lucrative cash crops. Pickups and concrete block houses became common in some places; today boom boxes and TVs are widespread, and a much larger variety of consumer goods is available in all areas, though cash incomes are still far lower than in other parts of Belize.

6. The way farmers spend their money should have an obvious affect on their farming success, though few anthropologists have studied this relationship. In Belize, Mennonite farming has been tremendously successful, partially because so much of their earnings are directly reinvested back into farming and food-processing and marketing enterprises.

7. There are a surprising number of people living like this in rural Indiana, where I live now. It is still possible to remain largely outside the cash economy in many rural areas of the United States. This raises the key question of whether or not "low income" really means "poor."

8. Horowitz (1988) reports that a gallon of beer a day was considered the absolute minimum acceptable standard ("poverty line") for working men in many 19th-century cities.

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A World without Boundaries
The Body Shop's Trans/National Geographics

Caren Kaplan

> For me Trade Not Aid also advanced the possibility that one day we would be able to go to the source for all our products—cut out the middlemen and trade directly with those people throughout the world who grew or harvested the raw ingredients we needed. That was my ambition. I wanted to be Christobel Columbus, going into little villages in Mexico or Guatemala or Nepal and seeing what they had to trade, instead of going to those boring old trade fairs where everyone buys the same mediocre products year after year.
>
> —Anita Roddick[1]

Just how tempting and powerful is the notion of "a world without boundaries" at this historical juncture? A world without boundaries means many things in postmodernity; not only solace from nation-state terrorism at fraught borders or relief from the vast policing of citizenry through the computer data of everyday life, but also the articulation of an economic order. For an entrepreneur such as Anita Roddick, the founder of The Body Shop, a world without boundaries signifies the freedom to imagine a link between European merchant/explorers and present-day multinationals; free trade without middlemen means liberation. The notion of a "world without boundaries," then, appeals to conservative, liberal, and progressive alike—the multinational corporation and the libertarian anarchist might choose to phrase their ideal world in just such terms. But can the formation of free trade zones and postmodern theories of diasporic subjects be equated?

I am interested in the representation of "the world" as it appears in several linked but distinct discursive formations. In particular, I am concerned with the resonances between contemporary cultural criticism and popular culture. Articulations of theories

of diaspora, for example, might be seen to be produced by some, if not all, of the same interests that produce a slogan for a Ralph Lauren perfume, such as "a world without boundaries." Yet, it would be reductionist, even purposeless, to confuse all sectors of society with one another. If a yearning for boundarylessness can be linked at all to the destabilization of the nation-state, I would argue that such a link must be carefully historicized and contextualized. More specifically, I would like to illustrate this methodological and political challenge by posing two related questions: how do Euro-American feminist discourses propose "worlds without boundaries," and what complicities with and resistances to transnational capital can be discerned in the practice of these feminist articulations?

Trans/National Geographics: Mapping Gender Commodification in a New World Order

National Geographic's articles on travel offered the housewife an escape from reality to remote places of the globe and enabled her to enjoy the fantasy position of entering into situations completely different from her own life. The *Geographic* made the housewife happy and productive. It refreshed, enlightened, and inspired her to prepare "something different for dinner that night," but most importantly, it did so without inspiring her to step out of place and upset the conditions of her everyday life.
—Lisa Bloom[2]

Just as *National Geographic* magazine has promulgated gendered national interests throughout the twentieth century through representations of managed cultural difference, print and visual media today articulate contemporary versions of geopolitics and gender. If the "national" is increasingly destabilized in favor of more transnational modes of social and economic organization, then the geographics of that world order can be recognized as under construction in media and advertising. Inasmuch as this particular construct has much at stake in mystifying the globalization of capital and celebrating the "national" character of "authentic" cultural differences, I am terming it "trans/national"—that is, the representation of the "world" in these forms of advertising signals a desire for a dissolution of boundaries to facilitate personal freedom and ease of trade even as it articulates national and cultural characteristics as distinct, innate markers of difference. Enabled by transnational capital flows, these representations are heavily invested in signs of traditional, non-metropolitan industries (marked as "native," "tribal," or "underdeveloped").

Such commodifications of cultural difference are profoundly gendered as well as imbricated in the production of other versions of alterity. To make such an assertion, however, is not to make claims for a unified subject of gender. *Different* women are formed through late capital's interpellations in different ways, often through the representation of travel and tourism.[3] I want to turn, then, to advertising that represents a certain kind of feminist project, constructing a Manichaean relationship between a feminist agent (consumer/entrepreneur) and her "other" (the indigenous female producer/resource), forming a trans/national geographic. As Rey Chow has argued, the "production of the native is part of the production of our postcolonial modernity."[4] I

would add that the Euro-American feminist production of the native is part of the production of postmodernity; that is, apparently progressive gender politics articulated through liberal discourses of equality and self-empowerment may participate in the *re-objectification* of the "gendered subaltern subject."[5] Euro-American "global feminism" homogenizes economic and cultural difference in favor of a universalizable female identity or set of sexual practices while simultaneously stressing cultural "difference" as a marker of value in an increasingly homogeneous world. That is, Euro-American, metropolitan feminism participates in the construction of cultural hegemonies even as it may also resist and strategize against such globalization. The question becomes who sets the terms of difference and similarity, who controls such representations, and, of course, at whose expense do these globalizations and resistances to globalization come?

Film, video, print, music, "high" art as well as "low," all market differentiation and heterogeneity for contemporary consumption. Advertising, conversant in transnational markets and communications technologies, provides some of the most temptingly condensed messages about gender, global culture, and the relationship between local producers and global consumers. Producing local difference out of globalization is the hallmark of an interlocked series of advertisements for The Body Shop, a multinational corporation with a British accent, that markets products through appeals to a set of liberal political affectations. It is not insignificant that The Body Shop takes a principled stand *against* advertising, pointing to the absence of a "marketing" department in the corporation as part of a critique of mainstream business practices.[6] Yet, The Body Shop, without "advertising," has managed since 1976 to achieve high visibility for its products and corporate identity through effective manipulation of news organizations that keep the corporation in the "news" and through visually striking displays in the shops, corporate packaging, shipping, and catalogs. Presenting itself as resolutely counterculture, The Body Shop has reworked the conventions of publicity to achieve a spectacularly successful mode of representation.[7] Therefore, I will refer to the visual and textual representation of the corporation and its products as "ads" as a way of resisting corporate discourse and to call attention to important shifts in marketing practices in a transnational context.

Increasingly, such shifts construct female subjects in new ways. In examining The Body Shop's corporate representation, I am not arguing that mainstream advertising is monolithically constructed against women through the hegemonic deployment of sexist representations.[8] Current advertising is replete with references to bourgeois feminist concerns; that is, middle-class and wealthy women are hailed as consumers with extremely significant buying power. Rather than interpret this state of affairs as the triumph of feminism, I view this process of ideological interpellation as one of a series of complex negotiations between Euro-American mainstream feminist efforts to consolidate subjectivity around raced, classed, and sexed bodies and the efforts of advanced capital to expand markets and construct new agents through cultural representation. And many of these ads depend upon a postmodern, postcolonial situation; that is, the consumer knows about centers and peripheries in a number of contradictory ways and must be brought into a particular trans/national logic, interpellated through visual and financial consumption into a seemingly voluntary and historically

specific relationship with global politics. Such a trans/national geographics advertises the downplaying of nation-state identities (except as ethnic or cultural "traditions") in favor of a generalized metropolitan or cosmopolitan site of consumption where "women" can "travel" in a world "without boundaries" through the practices of consumer culture.

Body and Soul: Traveling Trade and the Ethics of Exploitation

> I think all business practices would improve immeasurably if they were guided by "feminine" principles—qualities like love and care and intuition.
> —Anita Roddick[9]

> What I am suggesting is that at the end of the kaleidoscopic tunnel of the postmodernist text (art-text or commodity-text) there still sits the figure of that most traditional moral authority—the Author/Producer.
> —Paul Smith[10]

In his analysis of the corporate postmodernism of the Banana Republic throughout the 1980s, Paul Smith reads the advertising copy of the successful catalog as the evacuation of history from its purposeful representation. That is, in advertising that makes appeals to a "history" (here of European imperialism), the complete mystification of histories of social relations results in "stories" that bolster the corporate image of maverick trader. That such a world has been produced through the appearance of adventure and the history of oppression is, of course, not news but still requires readings against the grain. If the Banana Republic catalog has vanished, the J. Peterman version has risen to take its place. And if the Zeiglers, who founded Banana Republic, sold out to The Gap, they have resurrected the entrepreneurial spirit of empire with a "boutique" mail-order company called the Republic of Tea. All of these companies rely upon the "signature" of an "author" whose days spent roaming the globe signal the singular "trader/travel writer" who brings home the booty—information *and* goods. Value is accrued through the representation of personal travel, attested to by narratives of touring and discovery, and evidenced in the display of individually selected, "unique" items for sale.

The Body Shop has its own "author" and "producer" in the highly visible figure of Anita Roddick, the founder and current managing director. The corporate mythology of iconoclastic business against a heartless mainstream has found its literary articulation in the 1991 publication of Roddick's autobiography, *Body and Soul* (available through catalog and shop sales). As Shekhar Deshpande and Andy Kurtz have argued, *Body and Soul* represents Roddick as "undoubtedly vanguardist" yet promulgating a "*nostalgic* valorization of the petit-bourgeois subject-position where success is measured in terms of human perseverence, common sense, and a suspicion of hermetic bureaucratic structures."[11] Embodying that ethos and claiming to be an idealistic, 1960s "flower child," Roddick has traded upon her lack of conventional training in business to distinguish her company from others in an increasingly crowded field of "green" industries. She has also stressed her female-centered point of view, emphasizing that

her choice of a business in soaps and scents came from her experience *as a female consumer*. Forceful, flamboyant, and feminist, as a spokesperson for environmentalism as well as for her company, Anita Roddick is, as John Kuijper puts it, "the best selling commodity at The Body Shop."[12]

The values of entrepreneurial individualism, hard work, independence, and corporate responsibility that reverberate throughout Roddick's memoir and all The Body Shop texts and representations echo the fundamental precepts of Western autobiography as well as Western capitalism. Risk-taking yields knowledge of self and industry produces a community of responsible individuals. Travel (recalling an earlier era of capitalism) is required, both for the opportunities it affords for spiritual reflection and for the identification of new sources of materials and expansion of markets. In fact, Roddick often refers to both Columbus and Crusoe as models for her ideal entrepreneurial spirit. References to "adventure" abound along with admonitions to be frugal and give something back to the community. The founder of The Body Shop, a company whose pretax profit rose 20 percent to $15.2 million in the six months ending 31 August 1993,[13] claims that money means nothing to her, writing in her memoir:

> I am such a tramp, such a nomad. The accumulation of wealth has no meaning for me; neither has the acquisition of material riches. … I think the value of money is the spontaneity it gives you. There are too many exciting things to do with it right now to bother about piling it up, and in any case it is ennobling to give it away.[14]

Words to make Robinson Crusoe spin in his grave, perhaps. But then again, like Defoe's fictional protagonist, Roddick struggles with the spiritual meaning of life in the face of accumulating profits. This corporation *makes money* and the imputation is that it is the founder's very puritan work ethic (mediated by 1960s counterculture tastes) that makes it all work so brilliantly. Roddick's "origin story" includes Italian immigrant parents who settled in a seaside town in England, stints as a teacher and U.N. worker, early childbearing, a peripatetic husband, progressive politics, and a passion for hard work. Along the way, Roddick becomes a die-hard environmentalist *and* a millionaire, joining such companies as Ben & Jerry's in the vanguard of alternative, "ethical" corporations.

Even a company that grew phenomenally throughout a devastating recession in England and abroad will accumulate critics and ill will. The Body Shop has been under fire from the Left and the Right for some years, garnering lawsuits and attacks along with awards and homages.[15] The most recent, high-profile attack stems from an article by John Entine in *Business Ethics*, charging The Body Shop with hypocrisy in its stance against animal-testing as well as misleading the public about the "natural" characteristics of its products and mishandling franchises.[16] The entire Entine affair is a good example of the lucrative cross-referencing at work in transnational capitalism. The flurry of articles in newspapers and spots on television news that covered the rancorous exchanges between Entine and The Body Shop in effect superbly advertised Entine's six-page text. *Business Ethics*, a magazine with a relatively small circulation, published thousands of extra copies and issued press releases, thereby raising its visibility in a kind of piggy-back publicity onto The Body Shop's outraged response. In the media frenzy that ensued there were ample signs that a fickle public (led by an even

more fickle press) is ready to tarnish the saintly image of The Body Shop. That these more mainstream attacks occur just as U.S. and Japanese competitors rev into gear against The Body Shop's full-scale entry into their national markets (and as The Limited's Bath and Body Works begins direct competition with The Body Shop on its home ground in England) suggests that the appearance if not the practice of national trade interests have not yet been superceded.[17]

Embattled, but a significant multinational trader of continuing growth, The Body Shop's increasingly high profile in the United States in the last three years can be linked in part to a strategic alliance with the transnational giant, American Express. As Roddick notes in her memoir, The Body Shop's entry into the U.S. was planned for years in advance and very carefully orchestrated.[18] A number of newspaper articles and business writers expressed skepticism about a "no-advertising" policy in the mall-dominated U.S. market. For example, Harvard Business School professor Stephen A. Greyser was quoted in the *Wall Street Journal* as saying that The Body Shop's entry into the U.S. would fail without "major launch advertising."[19] Roddick, to prove that her business acumen is transgressive and successful, responded by printing up postcards that quote Greyser along with her response: "I'll never hire anybody from Harvard Business School. People are international. Ideas have wings. If we can manage in Chinese-speaking countries and in the Middle-East, why do they think America's going to be such a problem?"[20] Yet, obviously the U.S. presented a unique set of challenges that required new strategies, including an agreement with American Express to produce both television and print advertisements for the well-known credit card that would "star" Anita Roddick.

The American Express/Body Shop ads can be read as the celebrity marriage of entrepreneurial capitalism to bourgeois feminist travel-and-adventure motifs. Hailing a gendered consumer, the ad presents the figure of Anita Roddick as a kind of environmentally responsible feminist cum explorer who will guide us in the adventure of shopping. In the hallowed format of many American Express ads before this one, we are asked, "Do you know me?" In the following text, Anita Roddick introduces herself to a broader U.S. consumer base through her corporate philosophy and practice:

> For me, the joy of selling bubblebath is to take that profit and do something with it. "Trade Not Aid" is a way of trading honorably with indigenous communities in disadvantaged areas—not changing the environment or the culture. Instead, we listen to what these people need and try to help them with it. What we bring back with us are stories—how they do things, the connections; the essential wisdom of indigenous groups. Stories are the soul of The Body Shop. Customers come into The Body Shop to buy hair conditioner and find a story about the Xingu reserve and the Kayapo Indians who collect Brazil nuts for us. We showed them a simple process for extracting oil from the nut, which consequently raises the value of the raw ingredient we use. The result is we pay them more for it, and that gives them an alternative to their logging income, which in turn protects the rain forest. That's what we mean by helping through "Trade Not Aid."[21]

In unpacking this text, I want to emphasize several key points. First, the ad copy refers to a site of consumption that can only be in a metropolitan location where information about the Xingu reserve and the Kayapo Indians will be pleasingly novel. It assumes that a customer in the metropole will enter a store to buy a mundane item

such as hair conditioner only to procure simultaneously something "different." Secondly, it is implied that consumption leads not only to the pleasure of owning something but to the acquisition of a moral object lesson in Roddick's entrepreneurial philosophy, a set of practices she calls "Trade Not Aid." Trade Not Aid emits bits of 1980s-style Thatcher/Reagan injunctions in the 1990s, displaying a savvy, neoconservative message all wrapped up in environmentally sensitive packaging. Finally, Roddick mystifies the conditions of production through primitivism. The Kayapo, a tribe that is well-known in anthropological and environmentalist circles for resisting both national and corporate domination by utilizing sophisticated media, are depicted as simple "story tellers" who convey an "essential wisdom."

The images that accompany the text include Anita Roddick embracing "native" women who are dramatically tattooed and painted, bargaining for goods in a "colorful" market, and looking thoughtfully into space while wearing a hat that suggests "ethnic" fashion. Roddick's memoir contains many more of these photographs—all emphasizing her "going native" in her manner of dress and always marking the extreme cultural difference between "natives" and the entrepreneur from Littlehampton, England. *Body and Soul* is filled with examples of Roddick's search for authentic exotica and arcane beauty and bathing "secrets" based on "natural" ingredients (usually food stuffs such as fruits and vegetables). The company is founded on the premise that its products are inspired by Roddick's interactions with locals as she travels ("about four months every year").[22] The American Express ad emphasizes this aspect of Roddick as world-traveler and explorer, depicting her as fearlessly venturing among "indigenous communities in disadvantaged areas" in order to exchange First World assistance for Third or Fourth World products and labor. The presumption is that Anita Roddick is personally bringing economic aid to a periphery (here figured as "native women") and that the cosmetics marketed in The Body Shop are imbued with the moral and political value that such "pull-yourself-up-by-your-own-bootstraps" activity accrues.

Roddick appears to have reached the apotheosis of her desire to teach and make a difference in her invention of Trade Not Aid. Referring to this practice as an "international trading policy," Trade Not Aid differentiates itself from business as usual: "most multinational companies don't give a damn about the Third World," Roddick asserts.[23] Following her belief that the "Third World" needs "work rather than handouts," Roddick has trod upon some complicated ground. For example, her first project, the production of wooden "footsie rollers" in a Boys Town in India, went, in her words, "terribly wrong."[24] Completely bamboozled by local agents, rapturously embracing the "simple" way of life they thought they had "found," Roddick and her business partner and spouse, Gordon, raised funds among their franchises and affiliates to build another "town" for more unfortunate orphans. Meanwhile, the local agents simply pocketed the money for the rollers and had the product made off-site in sweat-shops. Once this deception came to light, the Roddicks, devastated by what they perceived as a betrayal, decamped to other locations including Nepal, Brazil, Mexico, and Indian reservations in the southwestern United States.

While Roddick declares her paper-making project in Nepal to be one of her most successful Trade Not Aid ventures, I am most interested here in The Body Shop's

excursion into the rainforest of Brazil. The Kayapo Indians have been the subject of numerous anthropological studies and, most interestingly, have developed syncretic, complex strategies of dealing with the destruction and usurpation of their land by government-sponsored development projects. The emergence of "indigenous media," cogently discussed in the work of Faye Ginsburg, Terence Turner, and Robert Stam and Ella Shohat, to name only a few, is conveniently ignored in Roddick's accounts of her visits to the Kayapo.[25] Instead, she muses upon an appropriate gift in return for the hospitality she has received and decides that a camcorder for every village would allow the Indians to "record all their collected customs, legends and wisdom about the rainforest, its animals and plants."[26] Here, Roddick's urge to erase the "middlemen" means that the agency of the tribe has been undercut, since there is no mention of an already flourishing video culture among the Kayapo nor the existence of the *Centro de Trabalho Indigenista* (Center for Work with Indigenous Peoples), which offers assistance with editing and other technological aspects to many of the rainforest tribes. In Roddick's rather breathless account of the Altamira demonstration against the destruction of the rainforest, an event that is presented as spiritually transformative for the Euro-American environmentalists/tourists, there is no acknowledgment of a long history of indigenous activism and resistance that might bring about such an occasion. Similarly, bringing beads to the Indians to be fashioned into "one of a kind" bracelets as a way to augment the Brazil nut oil industry resonates with tales from earlier European colonial encounters with "native" people; "trinkets" bartered for valuable resources have a long history that is refashioned here into a credo of noninterference in a way of life that is valuable only inasmuch as it remains utterly "different."

In discussing The Body Shop in *Beyond the Pale*, Vron Ware points out the classic "missionary discourse" and the correspondingly condescending tone in Roddick's interviews and advertisements, including an "uninhibited use of 'we,' meaning 'First World', and 'they,' meaning 'Third World' (that is, underdeveloped)."[27] I would push this observation further, because the distinction does not just simply exoticize the people Roddick meets in her travels or erase historically specific references to cultural and economic imperialism. Rather, The Body Shop discourse establishes a complete dichotomy between developed and underdeveloped, between First and Third World, such that any complex distinctions and differentiations within those categories are conveniently suppressed. We're left in a vaguely postcolonial zone of vanishing natives who require managed altruism from a concerned source of capital development. There are no complex metropolitan sites in The Body Shop's representation of periphery, nor are there metropolitan sites in which differentiated middle classes and elites themselves have any complicated stakes in development *or* underdevelopment. There are only "natives" and the "West," mediated by the benevolent capitalism of The Body Shop. This is a representational practice that homogenizes through the construction of binary oppositions, which depend upon and recycle the stereotypes and bigotries of an earlier era, and further construct a global feminism through the mystification of the operation of transnational capital.

Profits with Principles: Don't Leave Home without Them

> In the old days, the great British retailers may well have been driven by the profit motive but they were also great philanthropists, functioning pillars of society and builders of the community. Their monuments were museums and cultural foundations. Now what is the retailing industry building? Shopping malls!
> —Anita Roddick[28]

> It is precisely the proclaimed dissolution of public and private on the botanized asphalt of shoppingtown today that makes possible, not a *flaneuse*, since that term becomes anachronistic, but a practice of modernity by women for which it is important not to begin by identifying heroines and victims … but a profound ambivalence about shifting roles.
> —Meaghan Morris[29]

Trade Not Aid accounts for approximately one percent of The Body Shop's business. While most of the company resources are not committed in this direction, a large proportion of the corporate publicity is devoted to the representation of this policy. What is particularly chilling to me is The Body Shop's *representation* of a corporate *replacement* of the nation-state. It appears to be The Body Shop that funds and manages development projects, just as it appears to be The Body Shop that addresses health care, financing, and environmental concerns in its global reach. Because the liberal state has failed to address adequately micropolitics and macroeconomics, luring its citizens with dreams of progress and inclusion even as it structures inequalities into governmental principles, it leaves itself open for such "private" wish fulfillment. Who would not want some big, benevolent force to come and take care of everything (and who cares if the benevolence is based on a specific profit margin)? Like the big "fix-it" shop that its name puns upon, The Body Shop promises quick, cosmetic solutions: feel-good capitalism and warm, fuzzy geopolitics.

As part of Roddick's dream to "cut out the middlemen," her representational strategy is to excise all mediating agents. Regardless of country or location, there is little evidence of governments, banks, local elites, or any other mediating factors or agents (except as bumbling obstacles). There is only The Body Shop and the subaltern, indigenous subject in need. Although in her memoir Roddick mentions numerous "helpers" and facilitators, including translators and handlers, the catalog copy refines the discourse into a purer form. Here, it is simply "Anita" who makes the treks, bargains and barters with natives, and returns with stories and goods. While the company identifies target populations and sites for increasing production and access to exportable products, it markets a nostalgic narrative of "discovery" and entrepreneurial feminism. Thus, despite its global reach and transnational representational strategy, The Body Shop also recuperates the center and margin paradigm. As the American Express ad reminds us: "Don't Leave Home without It." Those of us who view this ad have "homes" in a "center" where we order goods from a "margin."

While The Body Shop ads are, in many ways, completely incoherent, their logic is that proposed by a world-system model. They posit a world that requires salvation from homogenizing globalization but ensures further exploitation through the unequal

power relations of managed "modernization." The contradictory discourse of trans/national geographics represents a world that is composed of center and periphery, yet the periphery is always on the point of vanishing. That is, there is no part of the globe that is seemingly unreachable—Anita Roddick has been literally *everywhere.* In researching difference to provide products for her business, she reinvents the periphery. On the one hand, she embraces modernization in order to alleviate underdevelopment; on the other, she constructs a world of differences that can never be homogenized for fear of depleting the imaginary resource of the exotic. Thus, to return to the American Express ad copy for a moment, the main narrative suggests a "story" of rational, managed exoticism in the periphery, where the extraction of "natural" ingredients for metropolitan cosmetics promises prosperity to a devastated local economy. Yet, the last few lines of ad copy destabilize that parable of modernization: "The travel I do is dangerous." "I am in bizarre places, remote places." Here comes American Express to the rescue, for apparently these dangerous, bizarre, and remote places are still linked to transnational capital—they "take" American Express!

Both the written text and the images in these ads glamorize and seek to legitimate unequal transnational economic relations in ways that suture modern and postmodern. That is, these meticulously produced inducements to consume operate by suggesting the modern and postmodern simultaneously through recourse to the modern discourses of travel, adventure, "international understanding," and development mediated by extremely contemporary technologies. Mass consumption, then, becomes a mode of travel that uses nostalgia for the modern past as a panacea for an uncertain present. Consumption is also a mode of production; it produces dominant images of a world of difference without boundaries and it creates sites or places where these ideas become practice. Mass consumption, as Robert David Sack puts it, is among "the most important means by which we become powerful geographical agents in our day-to-day lives."[30]

Yet, trans/national geographic agency is not evenly distributed or unproblematically assumed. Back in the putative "center," metropolitans have the luxury of manipulating the images of links and disjunctures, fantasizing *contact* with difference while maintaining a comfortable distance. Rather than use consumption as a way to learn about the operation of trade, to historicize the way the circulation of goods and money actually creates the world, to forge affiliations and alliances out of analyses of divisions of labor or patriarchal fundamentalisms, for example, metropolitans opt for romanticized representations of diversity. The shopping mall is the most obvious manifestation of this trend. A bigger and more postmodern variant on the collecting mania displayed in the bourgeois department store, the mall (like a mail order catalog) forms a site of consumption where everything appears to come to the consumer, effortlessly and in excess. To quote Sack again, by severing our connections to the world, such "places of consumption encourage us to think of ourselves not as links in a chain but, rather, as the center of the world."[31]

Binaries of center and periphery, global and local, and other oppositional representations of the world seem to produce fantasies of boundarylessness that only reinscribe essentialized difference. The myth of a "world without boundaries" leaves our material differences intact and even exacerbates the asymmetries of power that

stratify our lived experiences. To put it bluntly, few of us can live without a passport or an identity card of some sort and fewer of us can manage without employment. Our access to these signs and practices is deeply uneven and hardly carnivalesque.

In addressing the representational strategies of The Body Shop, I do not mean to suggest that it is a particularly reprehensible business (although it may be more duplicitous than some other corporations in protesting so vigorously against what it performs so well). I am interested in reading its representations against the grain simply to demonstrate that advertisements mask the workings of "business" or commerce in favor of the production of imaginary communities and subjects. It would be difficult to identify contemporary subjects who are *not* interpellated in the world-making activity of consumption. Collaborative studies of corporate practices, sites of consumption, and subject formation would contribute to a fuller and more accurate account of the phenomenon I have begun to examine here in a partial and preliminary fashion. Inevitably, as Meaghan Morris points out, the older models of travel will yield to other analyses of displacement. If both the explorer and the *flaneuse* drop out of our deconstruction of the subject of mall culture, then what articulations remain? Rather than echo American Express's Enlightenment question ("Do you know me?"), we might well ask: What work must we still do to come to know each other without engendering violence? In deconstructing the historically specific representations of a world without boundaries, we come to recognize its powerful allure for Euro-American metropolitan feminism, an allure that can only be resisted and critiqued and never, in these exact terms, be bought.

NOTES

1. Anita Roddick, *Body and Soul* (New York: Crown, 1991), 165–66.

2. Lisa Bloom, *Gender on Ice: American Ideologies of Polar Expeditions* (Minneapolis: University of Minnesota Press, 1993), 72.

3. I am interested in the construction of female subjects in this essay but my focus does not foreclose a discussion of this very process in the formation of male subjects and transgenders, for example.

4. Rey Chow, *Writing Diaspora: Tactics of Intervention in Contemporary Cultural Studies* (Bloomington: Indiana University Press, 1993), 30.

5. Here I must reference Gayatri Spivak's deeply illuminating, somewhat problematic, and always useful essay, "The Political Economy of Women as Seen by a Literary Critic," in *Coming to Terms: Feminism, Theory, Politics*, ed. Elizabeth Weed (New York: Routledge, 1989), 218–29.

6. In her memoir, *Body and Soul*, Roddick attacks the cosmetics industry for spending "obscene sums" on advertising and packaging and points out that such costs are passed on to the consumer: "We have never spent a cent on advertising. At the beginning we couldn't afford it, and by the time we could afford it we had got to the point where I would be too embarrassed to do it" (20).

7. The corporate annual report for 1994 notes that "someone buys from The Body Shop somewhere in the world every 0.5 seconds." The annual report for 1993 writes on its table of contents page: "On 29 February 1992, The Body Shop was trading in 41 countries and 19 languages. Numbers of stores worldwide: 727 (210 UK and 517 international). … Frequency with which shops open: 1 every 2.5 days …"

8. Some versions of Euro-American feminist critique of mass culture and advertising have taken such a line. See, for example, Rosalind Coward, *Female Desires: How They are Sought, Bought, and Packaged* (New York: Grove, 1985); Tania Modleski, *Loving with a Vengeance* (New York: Methuen, 1982); Erving Goffman, *Gender Advertisements* (New York: Harper and Row, 1976); and John Berger, *Ways of Seeing* (London: Penguin, 1972).

9. Roddick, *Body and Soul*, 17.

10. Paul Smith, "Visiting the Banana Republic," in *Universal Abandon?: The Politics of Postmodernism*, ed. Andrew Ross (Minneapolis: University of Minnesota Press, 1988), 145.

11. Shekhar Deshpande and Andy Kurtz, "Trade Tales," *Mediations* 18 (1994): 34.

12. John Kuijper, "The Entrepreneur, Exotic Collecting, and Consumer Culture: A Critical Reading of Body Shop Practices and a Challenge to Change the Model Retailer" (unpublished ms.).

13. See "Body Shop Reports Rise in Pretax Profit of 20% for First Half," *Wall Street Journal*, 15 October 1993, B8.

14. Roddick, *Body and Soul*, 257–8.

15. "Puff pieces" on The Body Shop appeared regularly in the *New York Times* throughout the late 1980s and early 1990s. See, for example: Linda Wells, "Venturers," *New York Times Magazine*, 4 February 1990, 58: "Another dreamer, an Englishwoman named Anita Roddick, is shaking up the cosmetics business in profound ways"; Deborah Stead, "Secrets of a Cosmic Cosmetician," *New York Times*, 23 September 1990, 25: "Ms. Roddick regularly treks to remote regions of Nepal and Brazil in search of natural oils, muds and methods"; and "Cosmetics Maker Adopts Renewable-Energy Plan," *New York Times*, 29 May 1992, D3: "The British cosmetics maker Body Shop International P.L.C., which prides itself on not using laboratory animals and is an active campaigner on environmental issues, will now use windmills for its power needs." In a column subtitled "Away From Home with Anita Roddick," Trish Hall profiles the company founder, rehashing the origin stories, reiterating the U.S. expansion plan, and noting a recent award from the N.A.A.C.P., an invitation to teach at Stanford, and a guest stint along with Anita Hill and Gloria Steinem at the 20th anniversary celebration of 9 to 5, the National Association of Working Women. See Trish Hall, "Striving to Be Cosmetically Correct," *New York Times*, 27 May 1993, C1, C8. More free advertising occured in 1993 in an article on The Body Shop's project to raise awareness about AIDS. See Clifford J. Levy, "Body Shop Starting a Campaign on AIDS," *New York Times*, 28 September 1993, D4.

16. See John Entine, "Shattered Image: Is The Body Shop Too Good to Be True?" *Business Ethics*, September 1994. Press releases and newspaper articles referred to Entine as "Emmy Award-winning producer John Entine, a veteran of ABC's '20/20' and 'Prime Time Live.'" Apparently not discouraged by The Body Shop's 32-page rebuttal, on August 31, Entine declared, "This story deserved to be told—I have told it." See Michael Swain, "I Stand by My Story on Anita, Gordon, and The Body Shop," *Evening Standard*, 31 August 1994, 16. The company appeared to take a heavy blow when the Franklin Research and Development firm, the largest independent firm to specialize in "socially responsible investing" sold all of its 50,000 shares of The Body Shop International in response to leaks about the content of Entine's article, causing corporate stocks to plummet. On August 25th, it was reported that Body Shop stock fell 9.5% from 242 pence, or $3.63 a share, to close at 219 pence. See Dirk Beveridge, "Uproar Threatens Body Shop Stock," *San Francisco Chronicle*, 25 August 1994, D1; and Michael Clark, "Body Shop Slides Further on Growing Concern Over U.S. Report," *London Times*, 31 August 1994, Business section. After an exchange of insults and impugning of integrity on all sides in the press, the furor appeared to subside slightly, leading to new headlines such as "Shares Rally for Body Shop." See *New York Times*, 3 September 1994, A36. Only last year, the Body Shop won a libel

suit and was awarded significant damages against the producers of a British television documentary that made similar allegations to Entine's. Obviously, the corporation is entering a new era of litigation and public relations strategies.

17. An article in 1991 detailed stiff competition from Estée Lauder and the Limited while an article in 1992 mentions even smaller but persistent competitors such as H²O Plus. In 1993, a feature article mentions "fears of market saturation." See Eben Shapiro, "The Sincerest Form of Rivalry," *New York Times*, 19 October 1991, L35, 46; Valerie Reitman, "Success of Body Shop Natural Cosmetics Attracts Imitators to the Scent of Profits," *Wall Street Journal*, 4 September 1992, B1, 2; Judith Valente, "Body Shop Has a Few Aches and Pains," *Wall Street Journal*, 6 August 1993, B1, 3.

18. Noting that the U.S. has "traditionally been the graveyard of British retailers," Roddick details the care with which this new market was approached, stressing that The Body Shop had more than 200 stores in 33 countries around the world before the first Body Shop opened in the U.S. in the summer of 1988. Roddick, *Body and Soul*, 131.

19. See Barbara Toman, "Body Shop May Need Ads to Sell Pineapple Facial Wash in U.S.," *Wall Street Journal*, 15 March 1989, B6.

20. Roddick, *Body and Soul*, 137.

21. I am using the text that appears in an ad in the August 1993 *Vanity Fair*.

22. Roddick, *Body and Soul*, 25.

23. Ibid., 165.

24. Ibid., 171.

25. See, for example, the discussion of Kayapo and other indigenous people's video projects in Ella Shohat and Robert Stam, *Unthinking Eurocentrism: Multiculturalism and the Media* (New York: Routledge, 1994), 32–7; Terence Turner, "Visual Media, Cultural Politics and Anthropological Practice," *The Independent* (January/February 1991): 34–40; and Faye Ginsburg, "Indigenous Media: Faustian Contract or Global Village?" *Cultural Anthropology* 6 (1991): 92–112.

26. Roddick, *Body and Soul*, 209.

27. Vron Ware, *Beyond the Pale: White Women, Racism and History* (London: Verso, 1992), 244.

28. Roddick, *Body and Soul*, 18.

29. Meaghan Morris, "Things To Do With Shopping Centres," in *The Cultural Studies Reader*, ed. Simon During (London: Routledge, 1993), 316. Also published in *Grafts: Feminist Cultural Criticism*, ed. Susan Sheridan (London: Verso, 1988), 193–225.

30. Robert David Sack, *Place, Modernity, and the Consumer's World: A Relational Framework for Geographical Analysis* (Baltimore, Md.: Johns Hopkins University Press, 1992), 3.

31. Ibid.

The Invisible Giant
Cargill and Its Transnational Strategies

Brewster Kneen

Established in 1865, Cargill is the largest private company in the United States. It started out primarily as a regional grain merchandizer in Minnesota (where it is still headquartered); it now describes itself as the largest agricultural commodities trader in the world, with global sales of $51 billion in 1994–1995 and a daily profit of $2 million after taxes.[1]

Yet few people are aware of Cargill's global reach, not even many of its own employees. In Memphis, Tennessee, the casual visitor to the office of Hohenberg Bros. would be hard pressed to know not only that it was the office of one the top five cotton trading companies in the world but also that it was a Cargill subsidiary.[2] In many towns and cities, the local Cargill office is housed in a nondescript building outside the main business district, with little indication of the company's presence except on the lobby plaque listing the building's tenants. This low profile is no accident. As Kerry Hawkins, president of Cargill Ltd (Canada) once put it, "Our experience is if you're too big, people don't want to do business with you."[3]

And Cargill is big. It employs some 72,700 people worldwide in 800 locations in 60 countries in more than 50 leading lines of business including corn, salt, peanuts, cotton, coffee, road transport, river-canal shipping, molasses, livestock feed, steel, hybrid seeds, rice milling, rubber, citrus, chicken, fresh fruits and vegetables, beef, pork, turkey and flour milling. Cargill is the world's largest producer of malting barley; the largest oilseed processor; and the second largest producer of phosphate fertilizer.[4]

Subsidies, Subsidies

Cargill's fortunes appear to have depended to a surprising extent, given the corporate ideology of free enterprise, on the major export subsidy programmes of the US government, particularly over the past 50 years.[5] Immediately after the Second World War, programmes of the UN Relief and Rehabilitation Agency and the Marshall Plan moved mountains of grain as aid to Europe. US wheat and flour exports jumped from

48 million bushels in 1944 to 504 million in 1948. Grain companies, including Cargill, stored and delivered grain—for a fee—on behalf of the US government.

By the early 1950s, however, domestic food production in Europe began to rise to replace imports. The dumping of US grain was no longer welcome foreign aid, but unwelcome competition and an obstacle to the European goal of self-sufficiency in food. The response of the United States government, under heavy pressure from grain companies, was to subsidize the export of grain to countries outside of Europe under Public Law 480—the Agricultural Trade Development and Assistance Act, known as "Food for Peace"—which was passed in July 1954. As W. G. Broehl writes in his corporately-sponsored history of Cargill:

> PL 480 combined and extended the use of surplus agricultural products for the further- ance of foreign policy goals … The funds could also be used to develop new markets for United States farm goods … That it was a boon to the American grain traders goes with- out saying.[6]

Cargill has always been a major beneficiary of PL 480 finance. Between 1955 and 1965, Cargill's US grain exports increased 400 per cent, with sales rising from $800 million to $2 billion. By 1963, Public Law 480 had generated revenue for Cargill of $1 billion. In addition, between 1958 and 1968, Cargill received some $76 million for stor- ing grain, often in leased, publicly-owned terminals or terminals built with public funds.

Cargill has been quick to capture other subsidies as well. In 1985, the US Congress passed the Export Enhancement Programme (EEP) of the Food Security Act to bol- ster crop exports and help beleaguered US farmers. Under the EEP, eligible countries are designated each year by the US Secretary of Agriculture. Individual sales are then negotiated between the eligible country (or its designated agency) and a trading com- pany on the basis of the subsidy available at the time for that particular country. The subsidy is then paid to the company making the deal.

From 1985 to early 1992, the US government doled out $4.26 billion to 95 corporate trading companies under the EEP, with Cargill receiving some $800 million of this. In 1987, wheat sales under the EEP to China alone reportedly netted Cargill subsidies of $2 million.[7] Commenting on the EEP, the *New York Times* concluded:

> The Agriculture Department's $40 billion campaign to bolster crop exports, begun a decade ago to help beleaguered farmers, has instead enriched a small group of multi- national corporations while doing little to expand the US share of the world's agricul- tural markets … An examination of the subsidy programmes highlights the symbiotic relationship between one of the biggest and least scrutinized federal departments and some of the politically influential companies it regulates.[8]

Other publicly-funded programmes which have benefited Cargill and other grain processors and merchants in the name of US market share and global competitiveness are channelled through non-profit industry foundations and associations so that they are relatively invisible to the public.

Moulding Policy

Cargill has a full array of highly sophisticated lobbying styles to manipulate government policy and programmes to its advantage. Its reputation in the grain trade for doing so is extensive: as an executive in a competitor company said, "The big ones don't get that way by waiting around for something to happen."[9]

A prime mechanism is the revolving door of public service: (usually) senior Cargill executives take leave of Cargill for a stint in government advisory and policy positions, returning to the company when their mission is accomplished. The career of William R. Pearce, who retired as Cargill's vice-chair in 1993, is illustrative. In 1973, Pearce left Cargill to join the Nixon administration as deputy special representative for trade negotiations, steering a trade bill through Congress that, in Cargill's own words, "shaped international trade policy".[10] Pearce rejoined Cargill a year later in 1974.

Cargill employees or ex-employees have taken up key posts in the US Department of Agriculture (USDA) and in the US negotiating team for the recent GATT Uruguay Round. Such is the extent to which Cargill employees have rotated through positions at the USDA that one government investigator has called the practice "structural corruption".[11]

The next level of lobbying activity takes place through the myriad trade associations that represent a commodity or processing interest, such as turkey growers, flour millers, soybean processors, peanut growers or the feed industry (there are 77 pages in one directory of US agricultural associations with several per page). While many of these associations present themselves as producer organizations and claim to speak on behalf of farmers, organizations like the "Western Canadian Wheat Growers" and the "Western Canadian Barley Growers" are actually financed by corporations and speak for their corporate backers. Cargill has organized similar groupings in countries where it is seeking to establish a presence: in India, for example, farmers to whom it has sold hybrid corn have been encouraged to speak on behalf of the company.

In recent years, Cargill has also developed effective grassroots lobbying techniques to enhance its higher level activities and achieve favourable business climates at the local level. The Cargill Community Network (CCN), for example, is the name of a grassroots programme "aimed at improving Cargill's reputation and success in communities where it is doing business." The CCN is "designed to help win Cargill's public-policy objectives at every level of government" by spreading the word that Cargill is "a solid corporate citizen" while "building a reservoir of community goodwill that ensures we have friends when we need them."[12] From a computer database, network members receive information on state and national issues as well as identification of their state and national legislators; in some cases the network also negotiates group memberships "with leading business organizations."

Establishing Beachheads

Nurturing such networks is key to Cargill's operations around the world. Indeed, its success as a global company—and, in particular, its ability to enter new product

markets in many different localities—has depended on its capacity for identifying key political actors and politically-appropriate business openings. James R. Wilson of Cargill Technical Services in the UK recently described Cargill's approach to starting a business in a new country:

> Cargill speaks of beachheads. Much of business strategy has its origins in military strategy. Historic product-line beachheads for the company have been hybrid seeds (primarily corn), commodity export marketing and animal feed milling. The strategy has been: create the beachhead with inputs of capital, technology and a management nucleus: get the cash flow positive; re-invest the cash flow and expand the beachhead … The company generally insists on majority ownership in beachhead companies because it needs to be clear who is responsible for the management of an individual company.[13]

Hybrid seed has proved particularly attractive as a "beachhead product" because it requires virtually no capital investment. In Tanzania, for example, Cargill's seed business has 24 staff, most of whom are involved in seed production. Four or five of them, however, "bounce around the country on dirt bikes setting up a dealer network" and selling and delivering seed in small quantities of one to ten kilogrammes. Managers, meanwhile, work with "contract seed growers who run much bigger farms than most of their customers."[14] The hybrid seed business is then used as a "Trojan Horse" to create dependency among farmers upon Cargill's "crop inputs" of fertilizers and advice; as a result, they eventually become indebted suppliers of commodities, either for trade or processing. Besides Tanzania, Cargill has used hybrid seeds to establish itself in Argentina, India, Pakistan, Zambia, Zimbabwe, South Africa and Malawi—all of which have the potential to become major grain and oilseed growing regions.

Elsewhere, other products have been used. In Indonesia, for example, Cargill scout Kees Nieuwenhuyzen recommended in 1970 that Cargill start a feed company and a small chicken breeding hatchery. By 1982, Cargill's operations had grown to two feed mills, three chicken breeding farms and a hatchery with an annual production of 4.5 million broiler and layer chicks. Hybrid seed was subsequently added to the company's products, with the Indonesian government subsidizing 30 per cent of the costs of the seeds to farmers. James Spicola, a former president of Cargill, summarized the strategy:

> We start out with a reasonably small capital investment in a field to which we think we can bring some expertise and technology and management, then grow the business from there. We reinvest the profits and move into other opportunities as the situation develops … We've found that our welcome to the country is much more productive on a long-term basis if we've started small and grown.[15]

Stopped in Its Tracks

Despite its global reach and power, however, Cargill does not always get its own way. In Japan, it has consistently been hindered, if not blocked outright, by Japan's five large trading houses, known as the *Zaibatsu*. Cargill tried to get into feed milling in Japan, but the government would only permit them to buy an existing plant. When it

tried to do so, all the mills in Japan agreed among themselves not to sell to Cargill. After US government intervention on Cargill's behalf, the Japanese government eventually gave Cargill permission to build a new plant—but, unlike other importers of feedstuffs, required Cargill to pay duty on its imports. Without duty-free imports, the plant could not compete in the Japanese market and Cargill was forced to lobby again for the import duties to be lifted. This was eventually agreed, but the company has still been unable to expand its operations or become a major player in the Japanese feed market.

In addition, Cargill's failure to understand Japanese consumer tastes and work practices have also caused it major problems. In 1991, for instance, it announced that it was to build a beef "further-processing" plant to "enable Cargill to serve the expanding appetite of Japanese consumers for redmeat products as Japan liberalizes its meat-import laws." Barely two and a half years later, Cargill halted its operation and sold the processing plant to Nippon Meat Packers at a reported loss of $10 million. Industry insiders say that the venture failed because Cargill failed to understand the Japanese food distribution system, thinking instead that what worked in the US could be simply duplicated in Japan. However, Japan's food service industries and supermarkets require frequent, small-lot deliveries, demands which Cargill could not meet. Nippon Meat Packers, unlike Cargill, has developed a system that gets customized beef orders to restaurants and supermarkets across most of Japan within 24 hours of being imported.[16]

In India, Cargill's global reach has been curtailed through the opposition of "powerless" peasants. In July 1988, the Indian government approved a "New Policy on Seed Development", reducing the duty on imported seeds from 95 per cent to 15 per cent. Cargill began to implement its 1983 decision to enter the seed business in India by setting up a joint venture company—Cargill Seeds India—with Tedco, a subsidiary of Tata, one of India's largest corporations. An office was established in Bangalore and in early 1993 Cargill started to build a seed processing factory on a 32-acre site at Bellary, 300 kilometres north of Bangalore. The facilities were to include an administration and seed technology training centre "to develop modern agriculture", and were scheduled to begin production in October 1993. The presence of Cargill in India, coupled with the push to conclude the Uruguay Round of the GATT negotiations, however, ignited a popular campaign against the company. On the morning of 13 July, local farmers gathered at the Cargill site, demolishing the partially-completed facility with their bare hands.

Resisting the Giant

Powerful though Cargill appears from its balance sheet and its political contacts, there are clearly many things that it cannot do. Cargill and other transnational corporations have the wealth, skill and political leverage to outflank or overpower virtually any organization that attacks them head-on in a game which is rigged in their favour. They cannot, however, force people—either farmers or the general public—to play their game.

The Japanese *Zaibatsu* have practised one line of resistance to Cargill, banding together like warlords to defend "their" territory. The farmers of India, in their numbers, have manifested another. The growing refusal of consumers to eat highly-processed food that has travelled from a centralized production facility and the rejection by increasing numbers of farmers of growing industrial monocultures are still others.

Around these old affirmations and new beginnings, social movements and their allies are making common cause worldwide to lay the grounds for socially-just and environmentally-sound alternatives to the global production systems which Cargill exemplifies. New forms of social organization are emerging which thrive on and generate diversity and inclusivity. It is hard to imagine a place for Cargill in such communities.

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Treading Lightly?
Ecotourism's Impact on the Environment

Martha Honey

Nestled in a national park on St. John in the U.S. Virgin Islands, Maho Bay Camps, 114 platformed tents hidden in deep foliage, overlook the turquoise-blue bay. Three miles of winding wooden walkways, designed to protect the growth and minimize soil erosion, connect the tents to the beach, communal toilets, cold water showers, and the large, gazebo-shaped dining-cum-meeting room. Maho Bay, the oldest, largest, and best-known property built and owned by New York developer Stanley Selengut, is one of the world's most famous and financially successful ecotourism resorts. Built in the 1970s, more than a decade before ecotourism gelled as a concept, this site-sensitive construction was both the cheapest and the least controversial technique, given the land's protected status. While the relatively rustic tents are billed as appealing to "vacationers of a Sierra Club bent," Harmony Resort, Selengut's "off the grid" condominium complex located just above the tents on the edge of the national park, has been ranked as the world's top "ecosensitive honeymoon resort."[1] These luxury villas are built almost entirely of recycled materials (although not from St. John): The roof shingles, for instance, are recycled cardboard and cement, the bathroom tiles are made from crushed light bulbs, and the decks are recycled newspapers. Each condo relies on solar and wind power, captured rainwater, and has a computer to monitor how much electricity and water guests use.

Today, the Maho Bay tented camp and Harmony condos have become among the most popular destinations for ecotourists from the United States. They operate at nearly 90 percent occupancy, yet Selengut boasts that he spends no money on advertising. Bookings come from repeat customers and word-of-mouth referrals and from garnering more good media coverage and awards than any other ecotourism project. By 1993, the tented camp was taking in $3 million per year on an initial investment of $750,000. "It's almost like stealing," Selengut told *Forbes* magazine.[2]

Just a few islands away, in Cuba, a trickle of U.S. residents challenge the travel ban and stay at the state-of-the-art Moka Ecolodge, adjacent to Las Terrazas, one of Cuba's

most successful post-revolutionary rural communities. Located in the lush tobacco and timber hills of Pinar del Rio province, Moka was the brain child of Osmany Cienfuegos, tourism minister, architect, and close confidant of Fidel Castro. In 1990, as the island's economy plunged into its worst-ever economic crisis following the collapse of Cuba's economic and political patron, the Soviet Union, Minister Cienfuegos conceived of the project as a way of providing a steady income for Las Terrazas in keeping with the community's ecological and social goals. Las Terrazas, whose red-tile-roof apartments are built on terraces around an artificial lake, was founded in 1968 when approximately 70 scattered farm families, charcoal makers, and construction workers elected to move together to gain access to schools, health care, and other amenities. From its inception, Las Terrazas was an experiment in sound environmental and human management, and its progress has been carefully nurtured and monitored by government officials, sociologists, scientists, and environmentalists. Most of the adults in this 850-member village are involved in reforestation work in and around the Sierra del Rosario tropical mountain forest that the United Nations Educational, Scientific, and Cultural Organization declared a biosphere reserve in recognition of its unique ecosystem.

Like Maho Bay's tented camp, Moka Ecolodge is connected to a national park and has a number of innovative and environmentally sensitive architectural features: No forest was cut or hillside razed in building the 26-room lodge; a small brook runs through the lobby; solar panels provide some of the electricity; and some of the food served was grown in hydroponic, organic gardens. In contrast with the privately owned Maho Bay, Moka Ecolodge was financed and built by the government and is owned and run by the local community, which is scheduled to repay the $6 million investment over a 15 to 20 year period. Ecotourism now provides employment for approximately 150 Las Terrazas residents, either in the lodge itself, as guides in the reserve, or in the several new community tourism projects, including a bakery, craft workshops, a coffee shop, and a small restaurant. Forty percent of the profits from the hotel go into a community development fund overseen by the neighborhood committee, and another 10 percent go directly to the community's health clinic, which also grows and uses herbal medicines. In addition, 60 percent of the profits from the various community businesses go into the development fund. Ecotourism earnings also have helped finance Las Terrazas' schools, day-care center, and a community-based radio project.[3]

Defining Ecotourism

Ecotourism is defined most succinctly by the Ecotourism Society as "responsible travel to natural areas that conserves the environment and improves the well-being of local people." There are other variants of this popular definition. Mexican environmentalist Héctor Ceballos-Lascuráin, one of several people who claim to have first coined the term, describes ecotourism as "a mode of ecodevelopment that represents a practical and effective means of attaining social and economic improvement for all countries." The definition used by the ecotourism program of the International Union

for the Conservation of Nature (or World Conservation Union) (IUCN) is "environmentally responsible travel and visitation to relatively undisturbed natural areas, to enjoy and appreciate nature (and any accompanying cultural features—both past and present) that promotes conservation, has low visitor impact, and provides for beneficially active socioeconomic involvement of local populations." In all these definitions, ecotourism is distinct from "nature," "adventure," "wildlife," and virtually all other types of tourism because it focuses not simply on the type of leisure activity, but on tourism's impact and the responsibilities of both the tourist and those in the tourism industry (such as tour operators or lodge owners).

In sum, ecotourism is travel to fragile, pristine, and usually protected areas that strives to be low-impact and (usually) small-scale. It helps educate the traveler; provides funds for conservation; directly benefits the economic development and political empowerment of local communities; and fosters respect for different cultures and human rights.

Origins and Growth of Ecotourism

Today, ecotourism, or at least a revamped version of nature and wildlife tourism, is the core of many developing countries' national economic development strategies and conservation efforts. At international conferences and in environmental and travel literature, the choice of countries seems endless: Bolivia, Belize, Dominica, Mongolia, Vietnam, Cambodia, Bhutan, Fiji, Indonesia, Senegal, Namibia, Madagascar, Uganda, and Zimbabwe are among the countries in Asia, Africa, and Latin America now on the ecotourism bandwagon. In several countries, nature-based tourism mushroomed into the largest foreign exchange earner, surpassing bananas in Costa Rica, coffee in Tanzania and Kenya, and textiles and jewelry in India.

Major international conservation organizations, including IUCN, the Nature Conservancy, Audubon Society, Conservation International, Africa Wildlife Foundation, Sierra Club, and World Wildlife Foundation, have initiated ecotourism-linked departments, programs, studies, and field projects, and many are conducting nature tours, adventure tours, or ecotours for their members. International lending and aid agencies pump millions of dollars into projects with ecotourism components. The Ecotourism Society (TES), a small, energetic nonprofit organization based in Vermont, includes among its 1,200 paid members travel industry representatives, government officials, academics, and consultants in more than 75 countries.

Today, virtually every country in the world is marketing some brand of ecotourism. Tourism has become a big business: As a $4 trillion-plus annual industry, it is the world's number one employer, and it vies with oil as the world's largest legitimate business. If it were a country, it would have the second-largest economy, shadowed only by the United States. The world's biggest generator and beneficiary of tourism is the United States, accounting for about 15 percent of total spending.

Sound Ecotourism vs. Ecotourism "Lite"

Throughout much of the 1990s, ecotourism has been trumpeted as a way to provide resources to help protect wildlife and fragile ecosystems, a development tool for rural communities living around parks and other protected areas, and a greener, cleaner alternative to the ills of conventional mass tourism. In reality, the picture is more complex. For instance, held up to this multilayered definition of real ecotourism, the two Caribbean resorts Maho and Moka show both strengths and shortcomings. While Maho Bay has helped to popularize the concept of ecotourism and is creatively pushing the perimeters of ecolodge design, it has paid little heed to other ecotourism principles involving the local community, conservation, and tourist education. Maho Bay employs few West Indians (most of the staff are young, single North Americans working for low wages in exchange for a stint in the tropics), does not promote local crafts in either its decor or gift shop, and has done little for the island in terms of financial contributions to environmental or social welfare projects. "These are green lodges, not real ecotourism," comments Joshua Reichert, director of the Pew Charitable Trusts' environmental program, who attended an ecotourism workshop at Maho Bay.[4]

Moka Ecolodge, in contrast, is clearly providing jobs and badly needed income to the local community of Las Terrazas and is generating additional resources to help protect the near-by biosphere. This state-financed lodge is too costly and cumbersome, however, to be easily replicated elsewhere on the island, and so far there has been scant foreign investment in Cuba's ecotourism sector.

Most importantly, however, visiting Moka presents a tough political choice for U.S. residents. The most serious impediment to the success of Moka and Cuba's other ecotourism projects, contends Tourism Minister Osmany Cienfuegos, is the U.S. embargo that has been in place for nearly four decades and carries the penalty (never fully enforced) of large fines and up to 10 years in prison for unauthorized visits to the island. "If the blockade were lifted, ecotourism would jump dramatically with the influx of North American tourists," Cienfuegos contends.[5] In pre-revolutionary Cuba, 95 percent of the tourists came from the United States; today, as the rest of the world does business with Cuba and tourist arrivals have tripled this decade, only a few thousand U.S. travelers brave the embargo or succeed in getting special U.S. Treasury Department licenses allowing educational or humanitarian visits to the island.

While, like Maho and Moka, many projects around the world may be missing a few of the pillars of sound ecotourism, others amount to little more than green packaging or labeling of conventional or mass tourism. In Costa Rica, Papagayo, a $3 billion mega-resort project that will include shopping centers, two golf courses, and a polo field—is officially called an "ecodevelopment." "Everyone calls themselves 'ecodevelopments,' but Papagayo is a city," retorts Costa Rican environmental activist Leon Gonzales.[6] Along Mozambique's southern coast next to South Africa, a U.S. developer is building "an $800 million ecotourism paradise" including a floating casino, a golf course with hippos in the water hazards, Club Med-style hotels, and imported wild game and San (popularly but derogatorily referred to as Bushmen) from the Kalahari Desert as additional "tourist attractions," while 10,000 local subsistence farmers and fishermen are to be moved out. Marketed as a "beast and beach" holiday package, the

project's wildlife reintroduction plan "reads like a cargo manifest for Noah's Ark," according to the *New York Times.*[7] In Nepal, tourists can avoid climbing the mountainous terrain via what is marketed as "ecotourism of the future"—helicopter treks to the summits of various mountains.[8] Even Walt Disney is capitalizing on the traveling public's desire to "go green" with an ecotourism-type theme park, Animal Kingdom, which has transformed a central Florida cow pasture into an African savanna. Now the public can "go on safari" without leaving the shores of the United States.[9]

Much of what the big players in the tourism industry sell as green tourism is known as "ecotourism lite"—minor environmentally friendly, cost-saving measures (such as not washing sheets and towels each day) or "add-ons" (a half-day hike into a rainforest or bird watching, for instance) to conventional vacations. Mainstream ecotourism, or ecotourism lite, is often described with catchy phrases such as "treading lightly on the earth" and "taking only photos, leaving only footprints," and its advertisements and brochures contain buzzwords such as *quiet, pure, lush, unspoiled, bio-* and, of course, *eco-* and *green.* In the mid-1990s, the World Travel and Tourism Council (WTTC), whose members include the directors of airlines, hotel chains, cruise lines, and major tour agencies, launched its "Green Globe" logo program designed to promote companies "committed to environmental improvement." As originally outlined by WTTC president Geoffrey Lipman, for as little as $200 a travel and tourism company could purchase the right to use the Green Globe logo in all its literature, giving the impression it was "going green." However, there was no oversight to ensure the company had instituted environmentally sound practices.[10]

While big players in the industry try to package themselves as green, on-the-ground ecotourism frequently involves conflicting control of natural resources and tourism dollars, struggles over local versus international ownership, and public policy versus private enterprise debates. However, the most contentious and overlooked part of the ecotourism equation is typically involving, benefiting, and respecting the rights and culture of the local communities.

Lessons from Kenya

East Africa is renowned as the home of both mankind's earliest ancestors and some of the world's finest wildlife game parks. It is also one of the places where the concept of ecotourism first evolved. Kenya, in particular, was the site of the continent's earliest government experiments with applying ecotourism principles to several national parks and reserves. Today, virtually every country in East and southern Africa is aggressively competing in nature tourism and ecotourism, and tourism has surpassed coffee as the number one foreign exchange earner in both Kenya and Tanzania. In many ways, East Africa serves as both a beacon light and a warning light for community-sensitive ecotourism policy and practices.

Under colonialism, Africa's national parks were originally created as exclusive domains for white hunters, scientists, and tourists. Hundreds of thousands of rural poor were forcibly moved (some chiefs were tricked with phony "treaties") and relocated to the parks' perimeters. The colonial philosophy, initially adopted by post-colonial

governments, was that wildlife had to be protected from the local Africans with fences, fines, and fire-power. In fact, pastoralists such as the Maasai in Kenya and Tanzania had evolved elaborate systems for living in harmony with wildlife; it was only with the arrival of European hunters and settlers that the rapid extermination of African game began. Despite this reality, colonial park policy typically barred Africans from hunting (or even having a gun), collecting grasses, firewood, or water, or visiting sacred and burial sites inside national parks. Those living on the parks' peripheries received little or no benefit from the parks, wildlife, or tourism.

Resentment grew, as did resistance borne of necessity, including illegal hunting, fires, grazing, and collection of firewood inside the parks and reserves. Despite the escalating military tactics by park guards—endorsed and sometimes financed by international conservation organizations such as the World Wide Fund for Nature—poaching within parks of elephant, rhino, and other wildlife soared sharply in Kenya and Tanzania during the 1970s. Faced with this growing clash between people and parks, scientists, park officials, and environmental organizations began to rethink the protectionist conservationist model and to argue that threatened species and ecosystems would survive only if those people living nearest them benefited financially from both the parks and tourism. Thus, the origins of ecotourism can be traced, in part, to East Africa, where in the late 1960s and 1970s conservationists began to posit a "stakeholders" theory of conservation: that those living on their perimeter should receive direct benefits from wildlife and tourism. As scientist David Western, the on-again, off-again director of Kenya Wildlife Service and the first president of the Ecotourism Society, writes,

> Conscientious concerns for nature were soon extended to local (usually indigenous) peoples. Implicit in the term [ecotourism] is the assumption that local communities living with nature can and should benefit from tourism and will save nature in the process.[11]

It was in Kenya that Africa's first official experiments with this new approach began. The imperative to find a balance between people and parks had been great in Kenya because nearly all of its 50-plus national parks and reserves are small, incomplete ecosystems. Up to 75 percent of the wildlife either live in or migrate into the surrounding buffer zones where they destroy crops, harm livestock, and on occasion, kill people. In 1961, at the time of independence, Kenya's new government agreed to put two of the most popular tourist destinations, Maasai Mara and Amboseli game reserves, under the control of local county councils, which subsequently began receiving revenue from both park entrance fees and hotel and other tourism facilities inside these reserves.

Over the decades, both reserves have gone through bureaucratic permutations and a variety of experiments with community-run tourism projects and revenue-sharing schemes. These pioneering ecotourism experiments meant that sizable numbers of Maasai pastoralists living around the Mara and Amboseli received employment as hotel staff, drivers, guides, and park guards and rangers and that entrance fee revenues and a percentage of hotel profits supported local community projects. While poaching continued elsewhere—between 1975 and 1990 Kenya's elephant population dropped 85

percent and rhinoceroses by 97 percent—poaching was stabilized around Amboseli and Maasai Mara.

However, despite high income from tourism and low incidence of poaching, these two experimental parks are in trouble. The distribution of tourism profits has long been plagued with corruption and cronyism, enriching a handful of powerful politicians and businessmen. "The issues have always centered around money, and how the money is spent," commented one Maasai dissident. Today, few community projects are visible: The roads are in terrible disrepair and conditions in these most popular reserves are degraded by overcrowding and over-development.[12] These problems have been compounded by an overall decline in tourist numbers to Kenya, due to political instability, massive rains, and the country's declining international reputation.

The deterioration of Kenya's premier national parks and reserves has led to the rapid increase of private wildlife ranches. Most ranches are owned by white settler families who market an elegant but colonialist "Out of Africa" experience under the banner of ecotourism, catering to a very upscale international clientele. They have fenced off their estates to make wildlife parks: Some are involved in breeding endangered species such as the black rhinoceros or Rothchild's giraffe, others care for orphaned or wounded animals, and still others offer specialties such as bird watching or fishing. Many of these ranch owners are active in the Ecotourism Society of Kenya (ESOK), the continent's first such organization intended to set standards and promote ecotourism principles and practices.

Much of this is ecotourism lite, however: These ranches have carefully cultivated relations with powerful politicians and international conservation organizations, the travel press, and film makers, and are doing little revenue sharing with either local communities or Kenya's national treasury. According to environmental consultant Robert Hall,

> These owners cry about their huge expenses to maintain their fences and protect their pet rhinos but the truth is more complex. These guys have their own air strips, and no one, and I mean no one, knows how many people come and go during a year. Their charges are generally at least $250 to $600 per person per night. And what does the Treasury receive? Nada.[13]

Many of these settler farms have expanded into wildlife conservation and tourism in hopes of preserving and protecting their sizable tracks of land from government or squatter takeovers. Fundamentally, these private reserves are an attempt to maintain family wealth and a lifestyle from a bygone era "under the guise of conservation and ecotourism," says Maasai activist Meitamei Ole Dapash.[14]

The Future of Ecotourism

Some experts have pronounced ecotourism dead, passé, or hopelessly diluted. However, amid the superficiality, hype, and marketing, there are excellent examples around the world of dedicated people, vibrant grassroots movements and struggles, and much creativity and experimentation. Although real ecotourism is indeed rare and usually

imperfect, it is still in its infancy, not on its deathbed. Ecotourism has succeeded in fulfilling some of its stated goals: Most ecotours are educational for the tourist and many ecotourism projects are lower impact than conventional tours and are providing expanded benefits for conservation and environmental protection. The long-term challenge is to find ways to maintain the rigor and multidimensional qualities of genuine ecotourism while widening it beyond individual projects and making it integral to the concept of tourism in general.

The path toward a more planet-friendly tourism is paved with pitfalls. At present, ecotourism is a set of interconnected principles whose full implementation presents multilayered problems and challenges. Among the most pressing and only partially analyzed issues are: how to make poor, rural communities equitable stakeholders in parks and ecotourism; how to ensure, in this era of free trade and economic globalization, that locally owned enterprises and national capital can compete with strong foreign companies; how to balance a developing country's need to earn more foreign exchange by increasing tourism numbers with the need of fragile ecosystems for low-impact, small-scale tourism; how to allow, as ecotourism implies, exploration of pristine and uncharted areas of the Earth that are often home to isolated and fragile civilizations; and how to set up independent and competent mechanisms for monitoring, evaluating, and setting standards throughout the ecotourism chain.

As the millennium draws to a close, ecotourism has opened a bold new direction in how to explore the world. Whether ecotourism matures into adulthood, gains permanence, and becomes the predominant way we travel and interact with our physical and cultural environment in the 21st century depends on myriad factors. One step toward ensuring ecotourism's survival is helping to build a more discriminating and informed traveling public. The good news is that today's socially conscientious traveler can, with a bit of research and advance planning, find excellent ecotourism projects in nearly every corner of the world. Despite the constraints, there are growing numbers of travelers walking the path of socially responsible and environmentally respectful tourism.

NOTES

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Voluntary Simplicity and the New Global Challenge

Duane Elgin

At the heart of the simple life is an emphasis on harmonious and purposeful living. Richard Gregg was a student of Gandhi's teaching and, in 1936, he wrote the following about a life of "voluntary simplicity":

> Voluntary simplicity involves both inner and outer condition. It means singleness of purpose, sincerity and honesty within, as well as avoidance of exterior clutter, of many possessions irrelevant to the chief purpose of life. It means an ordering and guiding of our energy and our desires, a partial restraint in some directions in order to secure greater abundance of life in other directions. It involves a deliberate organization of life for a purpose. Of course, as different people have different purposes in life, what is relevant to the purpose of one person might not be relevant to the purpose of another. … The degree of simplification is a matter for each individual to settle for himself.[1]

There is no special virtue to the phrase *voluntary simplicity*—it is merely a label, and a somewhat awkward label at that. Still, it does acknowledge explicitly that simpler living integrates both inner and outer aspects of life into an organic and purposeful whole.

To live more *voluntarily* is to live more deliberately, intentionally, and purposefully—in short, it is to live more consciously. We cannot be deliberate when we are distracted from life. We cannot be intentional when we are not paying attention. We cannot be purposeful when we are not being present. Therefore, to act in a voluntary manner is to be aware of ourselves as we move through life. This requires that we not only pay attention to the actions we take in the outer world, but also that we pay attention to ourselves acting—our inner world. To the extent that we do not notice both inner and outer aspects of our passage through life, then our capacity for voluntary, deliberate, and purposeful action is commensurately diminished.

To live more simply is to live more purposefully and with a minimum of needless distraction. The particular expression of *simplicity* is a personal matter. We each know where our lives are unnecessarily complicated. We are all painfully aware of the clutter and pretense that weigh upon us and make our passage through the world more cumbersome and awkward. To live more simply is to unburden ourselves—to live more

lightly, cleanly, aerodynamically. It is to establish a more direct, unpretentious, and unencumbered relationship with all aspects of our lives: the things that we consume, the work that we do, our relationships with others, our connections with nature and the cosmos, and more. Simplicity of living means meeting life face-to-face. It means confronting life clearly, without unnecessary distractions. It means being direct and honest in relationships of all kinds. It means taking life as it is—straight and unadulterated.

When we combine these two ideas for integrating the inner and outer aspects of our lives, we can describe *voluntary simplicity* as a manner of living that is outwardly more simple and inwardly more rich, a way of being in which our most authentic and alive self is brought into direct and conscious contact with living. This way of life is not a static condition to be achieved, but an ever-changing balance that must be continuously and consciously made real. Simplicity in this sense is not simple. To maintain a skillful balance between the inner and outer aspects of our lives is an enormously challenging and continuously changing process. The objective is not dogmatically to live with less, but is a more demanding intention of living with balance in order to find a life of greater purpose, fulfillment, and satisfaction.

Misconceptions about the Simple Life

Some people tend to equate ecological living with a life characterized by poverty, antagonism to progress, rural living, and the denial of beauty. It is important to acknowledge these misconceptions so that we can move beyond them.

Impoverished Living

Although some spiritual traditions have advocated a life of extreme renunciation, it is inaccurate to equate simplicity with poverty. My awakening to the harsh reality of poverty began on my father's farm in Idaho, where I worked with people who lived on the edge of subsistence. I remember one fall harvest when I was about ten years old in the early 1950s. We were harvesting a forty-acre field of lettuce, and a crew of twenty or so migrant laborers arrived to go to work. I still recall a family of three—a father, mother, and a daughter about my age—that drove their old Mercury sedan down the dusty road into our farm. They parked in the field and, with solemn faces, worked through the day doing piece labor—getting paid for the number of crates of lettuce they filled. At the end of the day they received their few dollars of wages as a family, earning roughly sixty-five cents an hour. That evening I returned to the fields with my father to check on the storage of the crates of lettuce and found the family parked at the edge of the field, sitting against the side of their car, and eating an evening meal that consisted of a loaf of white bread, a few slices of lunch meat, and a small jar of mayonnaise. I wondered how they managed to work all day on such a limited meal but asked no questions. When I arrived for work the following morning, they got out of their car where they had slept the night and began working another day. After they had repeated this cycle for three days, the harvest was finished and they left. This was

just one of innumerable personal encounters with poverty. Over the next fifteen years I worked in the fields each summer and gradually came to realize that most of these people did not know whether, in another week or month, their needs for food and shelter would be met by their meager salary.

As I worked side by side with these fine people, I saw that poverty has a very human face—one that is very different from "simplicity." Poverty is involuntary and debilitating, whereas simplicity is voluntary and enabling. Poverty is mean and degrading to the human spirit, whereas a life of conscious simplicity can have both a beauty and a functional integrity that elevates the human spirit. Involuntary poverty generates a sense of helplessness, passivity, and despair, whereas purposeful simplicity fosters a sense of personal empowerment, creative engagement, and opportunity. Historically those choosing a simpler life have sought the golden mean—a creative and aesthetic balance between poverty and excess. Instead of placing primary emphasis on material riches, they have sought to develop, with balance, the invisible wealth of experiential riches.

If the human family sets a goal for itself of achieving a moderate standard of living for everyone, computer projections suggest that the world could reach a sustainable level of economic activity that is roughly "equivalent in material comforts to the average level in Europe in 1990."[2] If we do not delay but act with decision and determination, then humanity need not face a future of poverty and sacrifice. The earth can sustain a moderate and satisfying material standard of living for the entire human family.

Turning away from Progress

Ecological living does not imply turning away from economic progress; rather it seeks to discover which technologies are most appropriate and helpful in moving toward a sustainable future. Ecological living is not a path of "no growth" but a path of "new growth" that includes both material and spiritual dimensions of life. A simpler way of life is not a retreat from progress; in fact it is essential to the advance of civilizations. After a lifetime of study of the rise and fall of the world's civilizations, historian Arnold Toynbee concluded that the measure of a civilization's growth was not to be found in the conquest of other people or in the possession of land. Rather he described the essence of growth in what he called the *Law of Progressive Simplification.*[3] True growth, he said, is the ability of a society to transfer increasing amounts of energy and attention from the material side of life to the nonmaterial side and thereby to advance its culture, capacity for compassion, sense of community, and strength of democracy. We are now being pushed by necessity to discover freshly the meaning of "true growth" by progressively simplifying the material side of our lives and enriching the nonmaterial side.

Rural Living

In the popular imagination there is a tendency to equate the simple life with Thoreau's cabin in the woods by Walden Pond and to assume that people must live an

isolated and rural existence. Interestingly, Thoreau was not a hermit during his stay at Walden Pond. His famous cabin was roughly a mile from the town of Concord, and every day or two he would walk into town. His cabin was so close to a nearby highway that he could smell the pipe smoke of passing travelers. Thoreau wrote that he had "more visitors while I lived in the woods than any other period of my life."[4]

The romanticized image of rural living does not fit the modern reality, as a majority of persons choosing a life of conscious simplicity do not live in the backwoods or rural settings; they live in cities and suburbs. While ecological living brings with it a reverence for nature, this does not require moving to a rural setting. Instead of a "back to the land" movement, it is more accurate to describe this as a "make the most of wherever you are" movement.

Denial of Beauty

The simple life is sometimes viewed as a primitive approach to living that advocates a barren plainness and denies the value of beauty and aesthetics. While the Puritans, for example, were suspicious of the arts, many other advocates of simplicity have seen it as essential for revealing the natural beauty of things. Many who adopt a simpler life would surely agree with Pablo Picasso, who said that "art is the elimination of the unnecessary." The influential architect Frank Lloyd Wright was an advocate of an "organic simplicity" that integrates function with beauty and eliminates the superfluous. In his architecture a building's interior and exterior blend into an organic whole, and the building, in turn, blends harmoniously with the natural environment.[5] Rather than involving a denial of beauty, simplicity liberates the aesthetic sense by freeing things from artificial encumbrances. From a transcendental perspective, simplicity removes the obscuring clutter and discloses the spirit that infuses all things.

It is important to acknowledge these misleading stereotypes because they suggest a life of regress instead of progress. These misconceptions make a simpler life seem impractical and unapproachable and thereby reinforce the feeling that nothing can be done to respond to our critical world situation. To move from denial to action, we need an accurate understanding of the nature of simpler living and its relevance for the modern era.

Common Expressions of Ecological Ways of Living

There is no cookbook for defining a life of conscious simplicity. Richard Gregg, for example, was insistent that "simplicity is a relative matter depending on climate, customs, culture, and the character of the individual."[6] Henry David Thoreau was also clear that no simple formula could define the worldly expression of a simpler life. He said, "I would not have anyone adopt my mode of living on my account. … I would have each one be very careful to find out and pursue his own way."[7] Nor did Mahatma Gandhi advocate a blind denial of the material side of life. He said, "As long as you derive inner help and comfort from anything, you should keep it. If you were to give it up in a mood of self-sacrifice or out of a stern sense of duty, you would continue to

want it back, and that unsatisfied want would make trouble for you. Only give up a thing when you want some other condition so much that the thing no longer has any attraction for you."[8] Because simplicity has as much to do with each person's purpose in living as it does with his or her standard of living, it follows that there is no single, "right and true" way to live more ecologically and compassionately.

Although there is no dogmatic formula for simpler living, there is a general pattern of behaviors and attitudes that is often associated with this approach to living. Those choosing a simpler life:

- Tend to invest the time and energy freed up by simpler living in activities with their partner, children, and friends (walking, making music together, sharing a meal, camping, etc.), or volunteering to help others, or getting involved in civic affairs to improve the life of the community.
- Tend to work on developing the full spectrum of their potentials: physical (running, biking, hiking, etc.), emotional (learning the skills of intimacy and sharing feelings in important relationships), mental (engaging in lifelong learning by reading, taking classes, etc.), and spiritual (learning to move through life with a quiet mind and compassionate heart).
- Tend to feel an intimate connection with the earth and a reverential concern for nature. In knowing that the ecology of the earth is a part of our extended "body," people tend to act in ways that express great care for its well-being.
- Tend to feel a compassionate concern for the world's poor; a simpler life fosters a sense of kinship with people around the world and thus a concern for social justice and equity in the use of the world's resources.
- Tend to lower their overall level of personal consumption—buy less clothing (with more attention to what is functional, durable, aesthetic, and less concern with passing fads, fashions, and seasonal styles), buy less jewelry and other forms of personal ornamentation, buy fewer cosmetic products and observe holidays in a less commercialized manner.
- Tend to alter their patterns of consumption in favor of products that are durable, easy to repair, nonpolluting in their manufacture and use, energy-efficient, functional, and aesthetic.
- Tend to shift their diet away from highly processed foods, meat, and sugar toward foods that are more natural, healthy, simple, and appropriate for sustaining the inhabitants of a small planet.
- Tend to reduce undue clutter and complexity in their personal lives by giving away or selling those possessions that are seldom used and could be used productively by others (clothing, books, furniture, appliances, tools, etc.).
- Tend to use their consumption politically by boycotting goods and services of companies whose actions or policies they consider unethical.
- Tend to recycle metal, glass, and paper and to cut back on consumption of items that are wasteful of nonrenewable resources.
- Tend to pursue a livelihood that directly contributes to the well-being of the world and enables a person to use more fully his or her creative capacities in ways that are fulfilling.

- Tend to develop personal skills that contribute to greater self-reliance and reduce dependence upon experts to handle life's ordinary demands (for example, basic carpentry, plumbing, appliance repair, gardening, crafts, etc.).
- Tend to prefer smaller-scale, more human-sized living and working environments that foster a sense of community, face-to-face contact, and mutual caring.
- Tend to alter male-female roles in favor of non-sexist patterns of relationship.
- Tend to appreciate the simplicity of nonverbal forms of communication—the eloquence of silence, hugging and touching, the language of the eyes.
- Tend to participate in holistic health-care practices that emphasize preventive medicine and the healing powers of the body when assisted by the mind.
- Tend to involve themselves with compassionate causes, such as protecting rain forests and saving animals from extinction, and tend to use nonviolent means in their efforts.
- Tend to change transportation modes in favor of public transit, car pooling, smaller and more fuel-efficient autos, living closer to work, riding a bike, and walking.

Because there is a tendency to emphasize the external changes that characterize simpler living, it is important to reiterate that this approach to life is intended to integrate both inner and outer aspects of existence into a satisfying and purposeful whole.

Maintaining Ourselves and Surpassing Ourselves

An ecological approach to living invites us to continuously balance two aspects of life—maintaining ourselves (creating a workable existence) and surpassing ourselves (creating a meaningful existence). A statement by the philosopher and feminist Simone de Beauvoir helps clarify this: "Life is occupied in both perpetuating itself and in surpassing itself; if all it does is maintain itself, then living is only not dying." On the one hand, if we seek *only* to maintain ourselves, then no matter how grand our style of living might be, we are doing little more than "only not dying." On the other hand, if we strive *only* for a meaningful existence without securing the material foundation that supports our lives, then our physical existence is in jeopardy and the opportunity to surpass ourselves becomes little more than a utopian dream. Although many of the expressions of a simpler life listed above emphasize actions that promote a more sustainable existence, this should not distract us from the importance of the surpassing or inner dimensions of a life of conscious simplicity.

The many expressions of simpler living, both inner and outer, indicate that this is much more than a superficial change in the *style* of life. A "style" change refers generally to an exterior change, such as a new fad or fashion. Simplicity goes far deeper and involves a change in our *way* of life. Ecological living is a sophisticated response to the demands of deteriorating industrial civilizations. Table 42.1 shows the contrasts between the worldview of the industrial era and that of the emerging ecological era. Simpler ways of living in the ecological era will result in changes as great as the transition from the agrarian era to the industrial era. In an interdependent, ecologically

TABLE 42.1
Contrasts in Worldview between the Industrial Era and the Ecological Era

Industrial-Era View	Ecological-Era View
The goal in life is material progress.	The goal in life is to co-evolve both the material and spiritual aspects with harmony and balance.
Emphasis on conspicuous consumption—the "good life" is dependent upon having enough money to buy access to life's pleasures and to avoid life's discomforts.	Emphasis on conservation and frugality—using only as much as is needed; a satisfying life emerges with balanced development in cooperation with others.
Identity is defined by material possessions and social position.	Identity is revealed through our loving and creative participation in life.
The individual is defined by his or her body and is ultimately separate and alone.	The individual is both unique and an inseparable part of the larger universe; identity is not limited to our physical existence.
The universe is viewed as material and largely lifeless; it is natural that we who are living exploit the lifeless universe for our ends.	The universe is a living organism that is infused with a subtle life-force; it is important to act in ways that honor the preciousness and dignity of all life.
Emphasis on self-serving behavior (get as much for myself as I can while giving no more than is required in return).	Emphasis on life-serving behavior (give as much of myself to life as I am able and ask in return no more than I require).
Cutthroat competition prevails; compete against others and strive to "make a killing."	Fair competition prevails; cooperate with others and work to earn a living.
The mass media are dominated by commercial interests and are used aggressively to promote a high-consumption culture.	The mass media are used to promote a balanced diet of information and messages, including the importance of ecological approaches to living.
Nations adopt a "lifeboat ethic" in global relations.	Nations adopt a "spaceship Earth ethic" in global relations.
The welfare of the whole is left to the workings of the free market and/or government bureaucracies.	Each person takes responsibility for the well-being of the world.
Emphasis on personal autonomy and mobility.	Emphasis on connectedness and community.

conscious world every aspect of life will be touched and changed: consumption levels and patterns, living and working environments, political attitudes and processes, international ethics and relations, the uses of mass media, education, and many more.

The Push of Necessity and the Pull of Opportunity

Two compelling reasons exist for choosing more ecological approaches to living: the push of necessity and the pull of opportunity. The combined impact of the various *pushes of necessity* are staggering to contemplate. Here is an overview of our predicament:

- In 1930 the world had 2 billion people, in 1975 roughly 4 billion people, by the year 2000 the population is expected to exceed 6 billion people, and 2025 the world's population will approach 9 billion people. The vast majority of the increase in human numbers is occurring in the less-developed nations. Because the world's ecosystem is already under great stress, as these new billions of persons seek a decent standard of living, the global ecology could easily be strained beyond the breaking point, producing a calamity of unprecedented proportions.
- The gap between rich and poor nations is already a chasm and is growing wider rapidly. The average person in the richest one-fifth of the world's countries earned

$15,000 in 1990, whereas the average person in the poorest one-fifth of the world's countries earned $250. This sixty-fold differential between the rich and poor is double what it was in 1960.[9]

- More than 1.2 billion now live in absolute poverty—"a condition of life so limited by malnutrition, illiteracy, disease, squalid surroundings, high infant mortality and low life expectancy as to be beneath any reasonable definition of human decency."[10]
- Global warming will likely alter patterns of rainfall and disrupt food production, flood enormous areas of low-lying lands, displace millions of people, destroy fragile ecosystems, and alter patterns of disease in unpredictable ways.[11]
- Tropical rain forests are being cut down at an alarming rate, contributing to global warming and destroying precious ecosystems that required millions of years to evolve (and that contain a treasury of undiscovered pharmaceuticals).
- Cheaply available supplies of oil are being depleted rapidly and, within a generation, the world will be deprived of an energy source basic to our current form of high-intensity agriculture.
- Toxic wastes are being poured into the environment, and pollution-induced outbreaks of cancer and genetic damage may reach massive proportions.
- Overfishing and pollution of the world's oceans have led to a leveling off in annual fish catch at the same time that the demand for food from the world's oceans is increasing.
- The ozone layer is thinning over-populated regions of both the Southern and the Northern Hemispheres and threatens to cause skin cancer and cataracts in humans and unknown damage to the rest of the food chain.
- Thousands of plant and animal species are becoming extinct each year, representing the greatest loss of life on the planet since the massive extinction of dinosaurs and other animal and plant life roughly 65 million years ago.
- Acid rains from coal burning and sulfur-producing industrial processes are damaging forests, farmland, and freshwater streams.

These are not isolated problems; instead they comprise a tightly intertwined system of problems that require us to develop new approaches to living if we are to live sustainably. To live *sustainably*, we must live efficiently—not misdirecting or squandering the earth's precious resources. To live *efficiently*, we must live peacefully, for military expenditures represent an enormous diversion of resources from meeting basic human needs. To live *peacefully*, we must live with a reasonable degree of *equity*, or fairness, for it is unrealistic to think that, in a communications-rich world, a billion or more persons will accept living in absolute poverty while another billion live in conspicuous excess. Only with greater fairness in the consumption of the world's resources can we live peacefully, and thereby live sustainably, as a human family. Without a revolution in fairness, the world will find itself in chronic conflict over dwindling resources, and this in turn will make it impossible to achieve the level of cooperation necessary to solve problems such as pollution and overpopulation.

The United Nations *Human Development Report* of 1992 said, "In a world of 5 billion people, we discovered that the top billion people hold 83 percent of the world's wealth, while the bottom billion have only 1.4 percent."[12] We cannot expect to live in a

peaceful world with such enormous disparities between the rich and the poor. The prosperity of the technologically interdependent, wealthy nations is vulnerable to disruption by terrorism by those who have nothing left to lose and no hope for the future. *Only with greater equity can we expect to live peacefully, and only with greater harmony can we expect to live sustainably.*

If the world is profoundly divided materially, there is very little hope that it can be united socially, psychologically, and spiritually. Therefore if we intend to live together peacefully as members of a single, human family, then each individual has a right to a reasonable share of the world's resources. Each person has a right to expect a fair share of the world's wealth sufficient to support a "decent" standard of living—one that provides enough food, shelter, education, and health care to enable people to realize their potentials as productive and respected members of the family of humanity. This does not mean that the world should adopt a single manner and standard of living; rather, it means that each person needs to feel part of the global family and, within a reasonable range of differences, valued and supported in realizing his or her unique human potential.

With sustainability we can expand our experiential riches of culture, compassion, community, and self-determination. With a growing abundance of experiential riches the entire process of living will be encouraged, and a self-reinforcing spiral of development will unfold. Therefore, reinforcing the powerful push of necessity is the *pull of opportunity*—the potential of the simple life to yield a more satisfying and soulful existence. Many persons in developed nations find life to be psychologically and spiritually hollow—living in massive urban environments of alienating scale and complexity, divorced from the natural environment, and working in jobs that are unsatisfying. Many yearn for a more authentic approach to living, one that provides a fulfilling relationship with oneself, with others, with the earth, and with the universe. *Time* magazine and CNN television conducted a survey of Americans for *Time*'s April 8, 1991, cover story entitled "The Simple Life." The results are striking:

- Sixty-nine percent of the people surveyed said they would like to "slow down and live a more relaxed life," in contrast to only 19 percent who said they would like to "live a more exciting, faster-paced life."
- Sixty-one percent agreed that "earning a living today requires so much effort that it's difficult to find time to enjoy life."
- When asked about their priorities, 89 percent said it was more important these days to spend time with their families.
- Only 13 percent saw importance in keeping up with fashion trends, and just 7 percent thought it was worth bothering to shop for status-symbol products.

Another survey reported in a 1989 article in *Fortune* magazine entitled "Is Greed Dead?" found that 75 percent of working Americans between the ages of twenty-five and forty-nine would like "to see our country return to a simpler lifestyle, with less emphasis on material success."[13] Only 10 percent of those polled thought that "earning a lot of money" was an indicator of success. These polls reveal that a large fraction of the American public has experienced the limited rewards from the material riches of a consumer society and is looking for the experiential riches that can be found, for

example, in satisfying relationships, living in harmony with nature, and being of service to the world.

The combination of the push of necessity and the pull of opportunity creates an entirely new situation for humanity. On the one hand, a life of creative simplicity frees energy for the soulful work of spiritual discovery and loving service—tasks that all of the world's wisdom traditions say we should give our highest priority. On the other hand, a simpler way of life also responds to the urgent needs for moderating our use of the world's nonrenewable resources and minimizing the damaging impact of environmental pollution. Working in concert, these pushes and pulls are creating an immensely powerful dynamic for transforming our ways of living, working, relating, and thinking.

The Responsibility for Change

Unless dramatic changes are made in the manner of living and consuming in industrialized nations, we will soon produce a world of monumental destruction, suffering, conflict, and despair. Within this generation we must begin a sweeping reinvention of our ways of living or invite the collapse of our biosphere and allow global civilization to veer off into a long detour and dark age.

Because we face a crisis in the interconnected global system, changes at every level are needed. At the personal level we need a magnified global awareness and simpler ways of living. At the neighborhood level we need new types of communities for sustainable living. At the national level we need to adopt new policies with regard to energy, environment, education, media, and many more. At the global level we need new partnerships among nations. Although changes are necessary at every level, the foundation upon which success can be built is the individual and the family. It is empowering to know that each person can make a difference by taking responsibility for changes in his or her immediate life.

Just as we tend to wait for our problems to solve themselves, so, too, do we tend to wait for our traditional institutions and leaders to provide us with guidance as to what we should do. Yet our leaders are bogged down, trying to cope with our faltering institutions. They are so enmeshed in crisis management that they have little time to exercise genuinely creative leadership. We may keep waiting for someone else, but a key message of this book is that there is no one else. You are it. We are it. Each of us is responsible. It is we who, one by one, must take charge of our lives. It is we who, one by one, must act to restore the balance. We are the ones who are responsible for making it through this time of sweeping change as we work to build a sustainable future for the planet.

NOTES

1. Richard Gregg, "Voluntary Simplicity," reprinted in *Co-Evolution Quarterly*, Sausalito, Calif., Summer 1977 (originally published in the Indian journal *Visva-Bharati Quarterly* in August 1936).

2. Donella H. Meadows, et. al., *Beyond the Limits* (Post Mills, Vt.: Chelsea Green Publishing, 1992), p. 196.

3. Arnold Toynbee, *A Study of History*, Vol. 1 (New York: Oxford University Press, 1947), p. 198.

4. David Shi, *The Simple Life: Plain Living and High Thinking in American Culture* (New York: Oxford University Press, 1985), p. 145.

5. Ibid., p. 187.

6. Gregg, op. cit, p. 20.

7. Shi, op. cit, p. 149.

8. Quoted in Gregg, op. cit, p. 27.

9. Results from the 1992 *Human Development Report* (published by the United Nations) were reported in the *San Francisco Chronicle*, April 24, 1992, p. 20.

10. This definition of absolute poverty was taken from the "Address to the Board of Governors" of the World Bank by Robert McNamara, president, September 30, 1980, Washington, D.C.

11. See, for example, George Sanderson, "Climate Change: The Threat to Human Health," in *The Futurist*, Bethesda, Md., March—April 1992.

12. Ibid.

13. Survey done by *Research & Forecasts* for Chivas Regal, reported in the article by Ronald Henkoff, "Is Greed Dead," *Fortune*, August 14, 1989. Regional polls confirm these findings. A poll conducted in the San Francisco Bay area in 1986 found that when people were "given a choice between a simpler life with fewer material possessions and reaching a higher standard of living, they favored the simpler life by almost 3 to 1." Reported in the *San Francisco Chronicle*, October 2, 1986.

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