

Environmental Values: A Place-Based Theory

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Several recent authors have recommended that “sense of place” should become an important concept in our evaluation of environmental policies. In this paper, we explore aspects of this concept, arguing that it may provide the basis for a new, “place-based” approach to environmental values. This approach is based on an empirical hypothesis that place orientation is a feature of all people’s experience of their environment. We argue that place orientation requires, in addition to a home perspective, a sense of the space around the home place and that this dual aspect can be modeled using a “hierarchical” methodology. We propose a “triscalar,” place-oriented system for the analysis of environmental values, explore the characteristics of place-orientation through several examples, and employ these characteristics to distinguish acceptable and unacceptable aspects of the NIMBY (not-in-my-backyard) idea.

I. INTRODUCTION

Tip O’Neil, the late and popular former congressman from Massachusetts, said, “All politics is local.” Does it not follow that environmental policy, which must in some real sense politically define a good life in a good environment, is also necessarily local? We wonder whether this insight might help us formulate a general concept of sustainability that is based on a local commitment of citizens to protect their cultural and natural heritage.¹ In this paper, we propose a theory of environmental valuation that is based on a commitment to place.

Locally developed and formulated values, when expressed as strident opposition to the siting of solid waste disposal sites, waste treatment plants, and nuclear

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¹ A number of recent authors have advocated environmental values that are based on a sense of place. See, for example, Kirkpatrick Sale, *Dwellers in the Land* (San Francisco: Sierra Club Books, 1985); David Seamon and Robert Mugerauer, eds., *Dwelling, Place, and Environment* (New York: Columbia University Press, 1985); David Ehrenfeld, *Beginning Again* (New York: Oxford University Press, 1993); and Mark Sagoff, “Environmental Economics: An Epitaph,” *Resources*, no. 111 (Spring 1993): 2–7; Sagoff, “Settling America: The Concept of Place in Environmental Ethics,” *Journal of Energy, Natural Resources and Environmental Law* 12 (1992): 351–418. These authors continue the exploration of a theme introduced earlier by geographers such as Yi-Fu Tuan, *Topophilia: A Study of Environmental Perception, Attitudes, and Values* (Englewood Cliffs, N.J.: Prentice-Hall, 1974), and *Space and Place: The Perspective of Experience* (Minneapolis: University of Minnesota Press, 1977).

utility plants—what is usually referred to as “NIMBYism”—are often thought of as a hindrance to formation of a rational environmental policy.² If our theory is accepted, however, it follows that any democratically supportable environmental policy has to take NIMBYism, and the sentiments associated with it, into account as givens. Indeed, in accordance with the theory that we propose, local sentiments are embraced as the driving force constituting “environmental” values. The task, then, is to formulate a multiscale structure of valuation and policy formation that is based democratically in many local perspectives, and yet capable of embracing the imperative that local behavior be understood in relation to longer-term and larger-scale environmental problems—regional, national, and global.

As a first step, consider the strong argument, originally proposed by Mark Sagoff, that individuals conceptualize and answer questions regarding environmental protection very differently depending on the context in which the questions are posed. Sagoff argues, in particular, that when the context encourages respondents to answer as *citizens* rather than as *consumers*, one can expect quite different answers to questions such as whether to develop or preserve wild landscapes.³ Common, Blamey, and Norton, following Sagoff, have articulated and begun testing the “Sagoff hypothesis”: individuals consider questions arising with regard to their nonuse relationships with nature “in [the] citizen, as opposed to consumer, mode.”⁴ The early and limited evidence apparently supports the Sagoff hypothesis.

We believe, however, that the Sagoff hypothesis is better viewed as a proposal to shift paradigms, as advocating a change in how we express and describe environmental values, rather than as an empirical hypothesis. Sagoff’s emphasis on political values and community-oriented commitments conflicts with mainstream economists’ view of environmental value, which can be modeled in a market system; however, that is as we should expect, given that the Sagoff hypothesis is better understood as a decision to reject the economists’ fiction that environmental decisions can be modeled as the decisions of individuals acting in markets. Thus, while the Sagoff hypothesis is in this sense tautological, it is an important tautology because it suggests that we model the behavior of decision makers and members of the public not simply as they are driven by the limited motives of *Homo economicus*, but also as motivated participants in a process that involves *both* expressing *preferences* in the short run and, on a

² See Nicholas Freudenberg, *Not in Our Backyards! Community Action for Health and the Environment* (New York: Monthly Review Press, 1984), for a general discussion of NIMBYism. For an update, see Nicholas Freudenberg and Carol Steinsapir, “Not in Our Backyards: The Grassroots Environmental Movement” *Society and Natural Resources* 4 (1991): 235–45.

³ Mark Sagoff, *The Economy of the Earth* (Cambridge: Cambridge University Press, 1988), esp. pp. 50–57.

⁴ M. S. Common, R. K. Blamey, and T. W. Norton, “Sustainability and Environmental Valuation,” *Environmental Values* 2 (1993): 299–334, esp. 316–19.

multigenerational communitarian scale, articulating *aspirations* for future generations.

Although we agree with the Sagoff hypothesis that setting environmental goals must be political, we go beyond that hypothesis (as formulated by Common et al.), arguing that those political acts must be contextualized within a multiscaled, but locally centered, political process. Unlike economists who model environmental decisions as faced by a placeless, rational, individual, utility maximizer, *Homo economicus*, who costlessly migrates as necessary, we model environmental decisions as faced by individuals who are deeply influenced both by their individual perspective and by a local, community perspective. We see place-centeredness not as a failure of rationality, but as an expression of their commitment to one's own home and community. Our challenge is to accept these expressions of place preference and to integrate them into a larger, regional, and global community. Individuals, as we model their choices, conceptualize their environmental decisions as citizens who relate *from* a place, and *outward toward* their surroundings on several scales.

Having touted the legitimacy of local values, but also having recognized the legitimacy of regional and national interests in some cases, how do we decide the correct level, or scale, on which to address any given environmental problem? We answer: at the level of the physical system that corresponds to the temporal scale of the problem as it is formulated in policy discourse.⁵ Note that implicit in the recognition of a "problem" is an evaluation of possible outcomes. Concern that something of value is threatened is the essence of problem recognition and characterization, and the determination of the scale at which a problem will be modeled is an important part of this process. This design is therefore guided by implicit or explicit evaluations. Our approach strives to make the role of values more explicit in modeling environmental problems.

II. A PLACE-BASED THEORY OF ENVIRONMENTAL VALUATION

Our theory rests on the testable hypothesis that some form of territoriality is universal to all human cultures, especially to those aspects of culture that relate people and communities to their ecological, social, and cultural context.⁶

⁵Bryan Norton and Robert Ulanowicz, "Scale and Biodiversity Policy: A Hierarchical Approach," *Ambio* 21 (1992): 244–49, have argued that biodiversity policy, for example, must be addressed at the scale of the "landscape ecosystem" because of the long time horizon of the goal of sustaining biodiversity. These arguments are based on the central assumption of hierarchy theory, that systems of large spatial scale change more slowly than do their components, providing a means to correlate spatial and temporal scale. See note 15.

⁶Some readers will surely wonder whether we are making the somewhat stronger claim that the tendency to orient from a place is hereditary. While we do not wish to commit ourselves on this point, we are aware that our general theory is susceptible of an interesting hybrid interpretation. It seems plausible that the *tendency to orient from a home-place* is hereditary, given its similarity to evolved behaviors in other animals, such as territoriality. However, our theory, given

Hannon has noted, using existing data bases, that people desire to be near things they consider “good” and to be far from things they consider “bad.”⁷ People prefer to live near schools, churches, and grocery stores and far from sewage treatment and power plants, landfills, and prisons.⁸ He therefore proposes, as an empirical hypothesis, that human behavior exhibits “geographic discounting.”⁹ We formulate this hypothesis as follows: the intensity of one’s opposition to unpopular industries and the strength of approbation for desirable land uses, vary inversely with the distance of that activity from one’s own geographic “place.” We wish to be near the things we like and far from the things we fear.

(a) *General Form of the Hypothesis.* Although this testable scientific hypothesis serves as the “skeleton” of our theory, we do not mean to claim that simple measurements of distance will track, on a unit-for-unit basis, changes in environmental valuation. This empirical hypothesis simply establishes that the theory is place-based. The content of true place-based value must be a cultural artifact of local interactions, a dialectic between a culture and its natural context. Simple measurement of distance therefore provides no direct measure of environmental value. For example, communities in the foothills may orient toward the mountains, and identify with the mountain culture, and find “flatlanders” from the valley (who are physically closer, but culturally different) alien. The definition of communities and their territories is in this sense “lumpy” as compared to mere distance measures.

It follows that two individuals who live equidistant from a physical point may value that point very differently. Imagine, for example, members of two competing tribes who have shared an uneasy boundary for generations, and suppose that a single canyon at the intersection of their territories is the site of the dominant tribe’s greatest victory and of the less dominant tribe’s most humiliating defeat, when a decisive battle—perhaps generations ago—established exclusive rights of the dominants to valuable and contested territory. Two individu-

its local bias and commitment to local adaptations of culture to local habitats, also suggests that particular local practices and the values associated with them are learned in response to local environments. Place-orientating behavior may therefore be analogous to linguistic behavior. Just as there seems to be an inborn tendency to learn a language—to hear and imitate speech as patterned, for example—there may be an innate tendency to perceive and value from a specific local space. Moreover, also in analogy to linguistic behavior, the multiplicity of self-replicating language systems that coexist in the world, the content of place-oriented values may similarly be learned in local contexts. This possibility suggests the additional idea that one can, with considerable effort, learn the “language” of a new culture. What is learned in this process can be thought of as the many bits of wisdom that help an individual culture to live, to reproduce, to “sustain” itself, in its particular habitat/local niche.

⁷ Bruce Hannon, “Sense of Place: Geographic Discounting by People, Animals and Plants,” *Ecological Economics* 10 (1994): 157–74; Robert Mitchell and Richard Carson, *Property Rights, Protest, and the Siting of Hazardous Waste Facilities* (Washington, D.C.: Resources for the Future, 1986), p. 4; see Hannon, “The Discounting of Concern,” in *Environmental Economics*, ed. Gonzague Pillet and Takeshi Murota (Geneva: R. Leimgruber, 1987).

⁸ Hannon, “Sense of Place,” p. 160.

⁹ *Ibid.*, p. 159.

als, situated in these different cultures, will express very different values for the canyon, even if they happen to live equidistant from the canyon. Our point is not that these values are completely malleable. Although the canyon has specific physical features that must fit into the “story” of both tribes, the attitudes and images of it will also reflect historical-cultural events, and personal and cultural ties as well as simple distance. These special, culturally determined values are nevertheless shaped upon the basic skeleton of place-centeredness.¹⁰ To the extent that we can observe and measure *actual* choices made, deviations from simple geographic distance can therefore represent the extent to which a local culture has contributed to the nature-culture dialectic that has emerged at this place. Presumably, doing so would also allow us, with improved concepts and methods, to rank cultures according to the degree to which the distinctive nature of its culture is intertwined with the actual biogeography of the place.

Environmental values, viewed in this way, are cultural values that are constructed from a given perspective in space and time. The intensity of environmental valuation is highest in the here and now; this intensity is discounted from the home perspective across both time and space. It may be possible to understand this hypothesis as quantifiable in two more specific senses: (a) as a scientific hypothesis relating the physical distance of an object from point of domicile to intensity of value judgments; and (b) as a social-scientific hypothesis that allows us not only to predict how people will value things, but also to measure changes in local preferences as a result of experiences in democratic formulation of management goals. Sustainability planning in a community can be understood as an ongoing, community-based discussion of environmental value as part of an ecosystem management plan. This approach, we argue, will be reflective of local sense of place values to the extent that it identifies and protects the distinctive character of a place and the culture-nature dialectic that emanates from that place.

Spatial discounting should be understood in rough analogy to temporal discounting (whereby it is hypothesized that humans exhibit a nearly universal tendency to favor the present by preferring current enjoyments of positive experiences and seek to delay unpleasant experiences). If we put these two insights together—the two “discount rates” plotted as scales in space and time—we create a dynamic geography of the conceptual space in which we construct models of our life in our environment as we perceive it. These models are “contextual” in the sense that they are constructed from many individual local perspectives, as nested systems and subsystems organized hierarchically.¹¹

¹⁰ See Peter Gould and Rodney White, *Mental Maps* (Boston: Allen and Unwin, 1986), for a mathematical model, and interesting commentary, on the attachment to, and evaluation of, possible locations at which to live.

¹¹ See Bryan G. Norton, “Context and Hierarchy in Aldo Leopold’s Land Ethic,” *Ecological Economics* 2 (1990): 119–27, for a discussion of context and perspective as a formative idea of the land ethic.

(b) *Place and Space*. The geographer Yi-Fi Tuan argues that we need a sense of place *and a sense of the space around that place*, for it is the surrounding space that defines our place and shapes our sense of who we are.¹² This insight nicely encapsulates the idea that gaining a sense of place requires, at least, a perspective/home base *and* adoption of an appropriate sense of scale for interpreting events that affect one's experience. The choice of a perspective and associated scales on which to measure success in environmental management will be revealed in our choice of models to characterize environmental problems.¹³ We propose to embody this sense of place within a theory of place-relative value formation. To the extent that sense-of-place values exist within a culture, these will be expressed in the structure of the models that we choose to characterize and measure environmental problems. In this sense, our method is frankly value-laden: choice of a spatiotemporal hierarchy, which orients from a home place, involves a choice of what to see, what to model, and what to protect.

Our models are in this quite specific sense "phenomenological" rather than "objective." They reflect the environment as it is experienced from a local perspective and determinatively shaped by local orientation and implicit place-oriented valuations.¹⁴ We hypothesize that (a) environmental values are formed within a phenomenological space which is organized from some place and (b) that development of a full sense of place involves a recognition of the various scales on which one interacts with nature from that place. Mere place preference, if not accompanied by a sense of the space around the place, is incomplete. It is the opposite of hollow—lacking a spatial context it collapses into a simple, meaningless point. Both elements are therefore necessary for a full-fledged sense of place. The larger context is important because that context—which can be changed by many incremental decisions of individuals—is the context in which the future will face the problem of survival.

Speaking more formally, our multiscale hypothesis states that individuals conceptualize environmental decisions in a context that is further determined by a complex combination of (a) cultural adaptations/mores and (b) geographical orientation, where that orientation is characterized by (i) a "place" considered as a point of orientation and (ii) by concentric layers, or "scales"—identifiable, spatially organized subsystems, represented as a complex, hierarchical structure. The multiscale hypothesis is therefore more specific than is the Blamey-Common-Sagoff hypothesis and has more *potential* empirical content, in that it asserts the priority of local values and local governmental processes, within a larger, multiscale system of analysis. This priority represents a commitment to place-based values.

¹² Yi-Fu Tuan, "Man and Nature," Commission on College Geography, Resource Paper 10, Association of American Geographers, Washington, D.C., 1971.

¹³ Norton and Ulanowicz, "Scale and Biodiversity Policy."

¹⁴ Seamon and Mugrauer, *Dwelling, Place, and Environment*.

(c) *Hierarchy Theory*. Having argued that there exists a multiplicity, indeed a hierarchy, of spaces around a place, we propose using hierarchy theory, drawn from the scientific study of ecological systems as a set of methodological tools that give shape to the moral and evaluative decision space inhabited by communities.¹⁵ Hierarchy theory is characterized by two central assumptions. First, it is assumed that all observation and measurement is taken from some point in space and time, from inside a dynamic, multiscale system; Second, it is assumed that spatial relations are organized such that smaller systems change and cycle more rapidly than do larger systems. Adopting hierarchy theory ensures that individuals viewing the world from any point within the dynamic will see larger-scale systems as somewhat predictable and relatively “stable.” Policy is thus discussed within a locally based, multiscale system that is asymmetric in space-time relations. Those operating at a given level within the system are constrained by the level above them, and develop their dynamic behavior through interaction with the level below them. Survival of organisms, for example, depends on their adaptation to regularities presented to them by their local environment. At the same time, the cumulative impacts of individuals and cultures eventually impact those larger regularities, changing the context of future adaptations. Models of ecological systems should therefore be designed to represent a single focal level, with dynamics generated by interaction at the next lower level, and constraints imposed by the next higher level. One important, though little understood phenomenon of hierarchical systems is the possibility of positive feedback loops, which can create destabilization in the face of drastic perturbations, such as fires or smelters. These perturbations can be followed by either regeneration or degeneration. Degeneration is the collapse of cross-scale organization; however, more positively, it is also possible that a minor breakthrough at a smaller, and faster, level can start a new feedback,

¹⁵ It is customary to refer to multilevelled theories of scale as “hierarchy theory.” See, for example, T. F. H. Allen and Thomas B. Starr, *Hierarchy: Perspectives for Ecological Complexity* (Chicago: University of Chicago Press, 1982); Robert O’Neill, D. L. DeAngelis, J. B. Waide, and T. F. H. Allen, *A Hierarchical Concept of Ecosystems* (Princeton: Princeton University Press, 1986); T. F. H. Allen and Thomas W. Hoekstra, *Toward a Unified Ecology* (New York: Columbia University Press, 1992). For explicit attempts to apply hierarchy theory to practical problems of management and policy, see R. V. O’Neill, “Hierarchy Theory and Global Climate Change,” in Thomas Rosswall, Robert G. Woodmansee, and Paul G. Risser, eds., *Scales and Global Change* (New York: John Wiley and Sons, 1988); Bryan G. Norton, “Context and Hierarchy in Aldo Leopold’s Theory of Environmental Management,” *Ecological Economics* 2 (1990): 119–27; Norton, *Toward Unity among Environmentalists* (New York: Oxford University Press, 1991); and Norton and Ulanowicz, “Scale and Biodiversity Policy.” While we have used the term *hierarchy* ourselves, it is unfortunate that the term is often taken to imply a “top-down” flow of power and authority even though this implication is expressly not included in the use, by ecologists, of the term. The problem of top-down versus bottom-up authority is discussed below. Because of the confusing implication, we prefer the term *multiscale analysis*, and use it whenever possible. When it is unavoidable, however, the term *hierarchy* is used in the neutral sense which does not imply one or the other directional flows of power relationships. For a more detailed treatment of these issues, see Norton, “Should Environmentalists be Organacists?” *Topoi* 12 (1993): 21–30.

and transcend a crucial constraint. An extreme example of this process—discussed by Robert O’Neill and coauthors—is the evolution in diatoms of an ability to develop a silicon shell, removing the constraint of predation. As a result, diatoms radiated explosively until they used up most of the silicon in ocean waters. Such examples provide some reason for optimism, because the possibility of creating such radiating effects are greatly enhanced by the introduction of fast-changing cultural experimentation, and even more so by a conscious search for policies that have positive impacts on more than one level of environmental organization *and* have positive feedback loops.¹⁶

Note that hierarchy theory’s assumptions—that we observe, measure, and act from a perspective, and that this perspective is embedded within a larger conceptualization of the space around the local place—merely formalize the assertion of Tuan that place identification necessarily requires a sense of the space around the place. Hierarchy theory therefore serves to provide spatial structure and a mathematical method for relating the various scales that are perceived from a local perspective. This mathematical aspect can then provide the skeleton, also, for theorizing about place-based environmental models, values, and goals.

Our model therefore represents resource decisions as occurring on several different and somewhat independent scales. We therefore attempt to choose our conceptual model to be isomorphic with the temporal frame in which individuals conceptualize environmental problems. In addition, we want our models to be simple enough to act as exhibits in public discussions designed to formulate a rational environmental policy based on local values.

(d) *A Triscalar System.* To initiate discussion, we focus on three basic scales, each of which corresponds to a temporally distinct *policy* horizon, and each of which orients from an attachment to a home place: (1) locally developed values that express the preferences of individuals, given the established limits and “rules”—laws and market conditions, for example—within which individual transactions take place; (2) a longer and larger community-oriented scale on which we hope to protect and contribute to our community which might be taken to include the entire *ecological* community; and (3) a global scale with essentially indefinite time scales on which humans express a hope that their own species, even beyond current cultures, will survive and thrive.¹⁷ We seek to formulate many locally based sustainability ethics, and look forward to

¹⁶ See O’Neill et al., *A Hierarchical Concept*, pp. 170–75, for a discussion of the impacts of the bypassing of constraints on multiscaled systems. More generally, see Alan R. Johnson, “Spatio-temporal Hierarchies in Ecological Theory and Modeling,” in “Second International Conference on Integrating Geographic Information Systems and Environmental Modeling,” Breckenridge, Colo., 26 September 1993.

¹⁷ This triscalar approach is introduced in “Reduction *versus* Integration: Two Approaches to Environmental Values.” Also see Norton, “Evaluating Ecosystem States: Two Paradigms of Environmental Management,” *Ecological Economics* 14 (1995): 113–27, and Norton, “Ecological Integrity and Social Values: At What Scale?” *Ecosystem Health* 1 (1995): 228–41.

efforts to integrate each smaller level into the next larger level through a democratic process. We believe that it is only in this way that the local sentiment can be harnessed into a positive force for democratically supported change in our currently destructive cultural practices.

The middle scale, in which we feel concern for our culture, is especially important because it is at this scale that we also feel concern about the culture's interaction with the ecological communities that form its context. This scale corresponds roughly to the scale on which multiple generations of human individuals must relate to populations of other species, which are assembled into ecological communities. To value a Chesapeake waterman and his culture is to value, less directly but no less palpably, crucial bay processes and resources. Human cultures act as one species within a community. Good management requires, in the immortal words of Leopold, learning to "think like a mountain"—or like a bay.¹⁸ Nonetheless, we cannot avoid the fact that it is humans who must learn to think like mountains and bays, and who must develop the cultural characteristics of caring about these resources.

Local values are in this sense constrained by larger-scale environmental variables that normally change at a slower rate; we assume that successful cultures (ones that have survived for many generations in a particular place) will have evolved some form of control mechanisms to limit the extent to which individual decisions and collective, short-term decisions may alter the ecological context within which a culture evolves and develops.¹⁹ Such practices have "cultural survival value" because rapid alteration of the habitat of a group results in disintegration of customs and even economic practices such as agricultural techniques. These cultural constraints can be understood either as (a)

¹⁸ Aldo Leopold, *A Sand County Almanac* (New York: Oxford University Press, 1949); Susan Flader, *Thinking like A Mountain: Aldo Leopold and the Evolution of an Ecological Attitude toward Deer, Wolves, and Forests* (Columbia: University of Missouri Press, 1974); Bryan G. Norton, "The Constancy of Leopold's Land Ethic," *Conservation Biology* 2 (1988): 93–102; Norton, *Toward Unity*.

¹⁹ See Aldo Leopold, "Some Fundamentals of Conservation in the Southwest," *Environmental Ethics* 1 (1979): 131–41 (posthumous publication of an essay written in 1923); Leopold, *Sand County Almanac*; Madhav Gadgil, "Diversity: Cultural and Biological," *Tree* 2 (1987): 369–73; Madhav Gadgil and Fikret Berkes, "Traditional Resource Management Systems," *Resource Management and Optimization* 8(1991): 127–41; Fikret Berkes, Carl Folke and Madhav Gadgil, "Traditional Ecological Knowledge, Biodiversity, Resilience and Sustainability," Beijer Discussion Paper Series no. 31, Beijer International Institute of Ecological Economics, Royal Swedish Academy of Sciences, 1993; Madhav Gadgil, "Ecological Organization of Indian Society," *Indian Council of Social Science Research Newsletter* 21 (1993): 1–9; Bryan G. Norton, "On What We Should Save: The Role of Culture in Determining Conservation Targets," in *Systematics and Conservation Evaluation*, ed. P. L. Forey, C. J. Humphries, and R. I. Vane-Wright (Oxford: Clarendon Press, 1994); See Madhav Gadgil, Fikret Berkes, and Carl Folke, "Indigenous Knowledge for Biodiversity Conservation," for a discussion of factors affecting whether indigenous populations develop conservation constraints *Ambio* 22 (1993): 151–56. Also see N. V. Joshi and Madhav Gadgil, "On the Role of Refugia in Promoting Prudent Use of Biological Resources," *Theoretical Population Biology* 40 (1991): 211–29. For an application of localized thinking to international

centrally formulated constraints that are imposed on local cultures by a centralized authority, or they can alternatively be understood as (b) wisdom accrued from generalization based on local knowledge of locally experienced constraints. We will call these two related, but in important ways opposed, processes “top-down” and “bottom-up” valuation respectively.

III. SOME ILLUSTRATIVE EXAMPLES

Is a locally based sustainability ethic possible? It is unquestionably true that local communities have in many situations degraded their local resources. It might be thought that the local, home-centered attitude that gives rise to NIMBY-ism is incorrigible. We explore the possibility that a sustainability consciousness can be articulated and defended from a local viewpoint by exhibiting some anecdotes that illustrate important aspects of locally based perspectives on environmental values. While we have no evidence that these anecdotes are representative, we do believe they illustrate—individually and collectively—the complex interactions between place-based and centralized decision structures.

(a) *The Myth of Erisichthon*. In the time before writing, oral traditions contained many stories which warned against the abuse of sacred places, and against excess in altering nature.²⁰ Unwarranted consumption could lead to insatiable desire, a fate worse than death itself. The Greek story of Erisichthon is one of many entries in that tradition.

When Erisichthon, a rough and godless person, cut into the great oak in the sacred grove of Ceres, blood flowed from the wound. A spirit voice from the tree warned him of his awaiting punishment, but he continued until the great tree had fallen. The mourning spirits of the forest appealed to Ceres that Erisichthon be punished and she consented. Ceres requested Famine to possess Erisichthon. Famine obeyed, cursing Erisichthon, who awoke with a hunger which knew no bounds. The more he ate, the more hungry he became. To obtain the food for his growing hunger, he spent his entire estate and even sold his daughter into slavery. She appealed to Neptune to change her form, allowing her to escape her new master. Upon returning to her father, he only sold her again and again to earn food to sate his unquenchable hunger. It was not enough; Erisichthon finally consumed himself in desperation. Only in death was he free of the vengeance of Ceres.²¹

biodiversity policy, see Jeffrey A. McNeely, “Reversing the Loss of Biodiversity: Implementing Political, Economic, and Social Measures” presented at “Symposium on Biological Diversity: Exploring the Complexities,” University of Arizona, Tucson, Ariz., 25–27 March 1994.

²⁰ John Moore, personal communication.

²¹ This version is from Thomas Bulfinch, *Bulfinch's Mythology* (New York: Harper and Row, 1970), pp. 169–71. Bulfinch relied on a Latinized version of the myth, which explains why the gods in this version have Roman names.

The myth of Erisichthon shows that storytellers, even before written language, created illustrations of the evils of hubris and lack of realistic limits in the expansion of demand for resources. Erisichthon is faulted for destroying the largest tree—no doubt symbolic of the old-growth forests. At first, it is difficult to understand how Erisichthon could become hungrier the more he ate, but like all good myths, he is not a metaphor for each of us but for all of us together. Stories such as these were common throughout the Mediterranean and Middle East, even among preliterate cultures.²² Indeed, every major religion of the world recognizes that the right to use the Earth carries with it also an obligation to protect it for future use.²³

(b) *The Sacred Groves of India*. As new areas were settled in India, and land was cleared, a sacred grove was always set aside as the rightful abode of the local spirits who were displaced by development from their traditional homes throughout the forest.²⁴ As long as local customs were revered within the indigenous, local, and mostly animistic versions of Hinduism, the groves were carefully preserved. Only holy men could use the groves, and only for the gathering of ritual herbs and healing potions. Although the groves were carefully protected, in the wake of catastrophe—a fire or flood that destroyed the village, for example—trees could be cut from the sacred groves, but only after consultation with the spirits, and only with their ritually invoked consent. Once the spirits of the place were appeased, the sacred grove could be used to rebuild the village.

When the central authority of the Hindu religion, located in the cities, attempted consolidation and sought control over local worship (including the imposition of a common “liturgy”), priests were chosen by authorities and sent from the cities into the outlying villages. These priests, whose stated purpose was to unify Hindu worship under central authority, sought also to homogenize ritual and to stamp out local variations because these became symbols of local resistance to centralized authority. Some groves were destroyed intentionally; others suffered from lack of care and attention. The ones that remain represent some

²² John Moore, personal communication.

²³ Edith Brown Weiss, *In Fairness to Future Generations* (Tokyo and Dobbs Ferry, N.Y.: The United Nations University and Transnational Publishers, 1989), pp. 17–21.

²⁴ We are indebted to Madhav Gadgil of the Centre for Ecological Sciences of the Indian Institute of Science for both the details of this history and for a most stimulating conversation on the local nature of environmental values in Stockholm, July 1992. The protection of sacred groves was a common practice in many ancient cultures, which suggests that locally expressed religious traditions and distinctive local “worldviews” have been connected with limits on the scale of alteration of nature in many traditional cultures. See Gadgil, Berkes, and Folke, “Indigenous Knowledge for Biodiversity Conservation.” For an account of the destruction of the Indian forests through centralization under British rule, and of the losing struggles of local, indigenous tribes to maintain control over lands that they held by tenure, see Ramachandra Guha and Madhav Gadgil, “State Forestry and Social Conflict in British India,” *Past and Present* 123 (1989): 141–77, and Madhav Gadgil and Ramachandra Guha, *This Fissured Land: An Ecological History of India* (New Delhi: Oxford University Press, 1992).

of the few refuges for the native species that once inhabited the entire subcontinent.²⁵

The example of the sacred groves of India illustrates how local myths and rituals can tie cultural practices to the plants and animals in a region. The local roots of animism and ritual practices maintained the connection between people and their natural history. We can think of the setting aside of the sacred groves, first, as a religiously based act, but also as a recognition of limits in the destruction of nature and as an expression of a bond between a community of people, and with their past, their future, and their land. These links are both represented in concrete objects—medicines—and also symbols—materials for rituals—of connection to place. However, the priests from faraway cities did not identify with, or value, these benefits and symbols, corroborating the inverse relationship here suggested between concern and distance.

The intrusion of centralized authority conflicted with these local processes of value formation and, to the extent that local plants and the myths associated with them provide symbols of local experiences and their value, the existence of the sacred groves, and their spiritual occupants, stood in the way of centralized authority. Local values are associated with a particular place, they are forged out of a very intimate relationship with the biotic communities in a region, and their perpetuation is associated by local inhabitants with success in maintaining their sense of spiritual and physical place. These values conflict with geographically broader, centralized, and authoritarian values, when these are imposed by centralized authorities.

(c) *The Japanese Example.* Beginning as early as the 1200s, the feudal kings of Japan began to draw their boundaries with greater care, form small armed bands, and test the possibilities of expansion into the arable land of a neighbor. By 1500, these bands had become armies and feudal kingdoms numbered more than 250. The struggle for control of the island was fierce and protracted. Population growth may have been the root cause of the centuries of strife in Japan. About 1600, one family, the Tokugawa of Edo (Tokyo), and the river valley nearby became the victor in this long and nearly continuous war. The leader of this family, the first real Shogun, enacted a comprehensive set of social regulations to govern nearly everyone's life in detail. He expelled the Jesuits and all representatives of Western religions from the country, removed all metal weapons from the peasants (and rifles from the soldiers of the coastal lords), required them to stay in the place of their birth unless permitted to move by their lord, and most importantly of all, he established a rice tax. The tax, and its cotton equivalent, was heavy (between 25 percent and 35 percent of total production). The Shogun collected it through his soldiers-turned-administrators who dealt with feudal lords, who in turn dealt with headmen (mayors) of

²⁵ Gadgil et al., "Indigenous Knowledge for Biodiversity Conservation," 1993; Gadgil and Berkes, "Traditional Resource Management Systems."

the villages. The tax was based on a quota, established by a survey of the village production capabilities. The villages were regularly surveyed for changes in production and the quota was adjusted accordingly.

Population estimates reveal that the Japanese increased their numbers by about 50 percent to 30 to 35 million between 1600 and 1720. The population level remained steady until the 1870s, the end of the Tokugawa reign, when the country was forced "open" by Admiral Perry for the insistent U.S. trade and the need for Asian-based whaling ports. By using the hierarchical method of collection and control, the Shogun could use the detailed information available to the village headmen, and harness the detailed knowledge of the peasants about each other's farming potential. Such information insured that no family could conceal any significant increase in production. Everyone in the village realized that additional mouths to feed by one's neighbor would reduce their future ability to make contributions to the rice tax. Local ostracism over the appearance of inappropriate family expansion was intense. The method appears to have driven the population to a steady state and held it there for about 150 years, an unprecedented accomplishment.²⁶

Because the Shogun apparently sought peaceful economic sustainability for the nation, the Japanese example provides a top-down approach/solution to the problem of resource use, illustrating how resource conservation and limits on the exploitation of resources can be accomplished by a centralized authority, provided the centralized leadership is farsighted and provided the system is insulated from outside influences. The method of the Shogun has the virtue of not being a hypothetical solution; the costs, however, of this approach to conservation are enormous, measured as losses in individual and local autonomy. Can we, recognizing that resources are limited, achieve a steady-state population and resource protection on the local level with less costs to autonomy?²⁷

(d) *The Sangamon River Episode*. In 1967, the U.S. Army Corps of Engineers announced an enlarged version of its plan to dam the Sangamon River at Decatur, Illinois. The new reservoir would back water across one of the few remaining forests in the east central Illinois area at Allerton Park, and that fact was duly noted by one of the local citizens. He was then a graduate student in engineering at nearby University of Illinois, who as it turns out, held the park in a trust for the people of Illinois. He had been an engineer in nearby industry

²⁶ See Bruce Hannon, "Energy and Japanese Peasant Agriculture," *Journal of Social and Biological Structures* 69 (1983): 207-17, for more detail and further references.

²⁷ See, for example, Robert Heilbroner, *An Inquiry into the Human Prospect* (New York: W. W. Norton, 1974); William Ophuls, *The Politics of Scarcity: A Prologue to a Political Theory of the Steady State* (San Francisco: Freeman, 1977), and *The Politics of Scarcity Revisited: The Unraveling of the American Dream* (New York: Freeman, 1992); Bruce Hannon, "World Shogun," *Journal of Social and Biological Structures* 8 (1985): 329-41; Paul Kennedy, *Preparing for the Twenty-First Century* (New York: Random House, 1993).

and earlier, an officer in the Corps of Engineers. He set out to organize a fully documented, multidisciplinary attack on the premises for the proposal. The industrial and army experiences had taught him much about management and, over the next eight years, he documented and expanded the written criticism of the plan with the help of other citizens. In short, he engaged in the political and social organizing activities which are now seen as fundamentally necessary for the successful challenge of such a plan. Today the park is federally designated as national natural landmark, the Congress has deauthorized the proposal, and the army has closed the regional office which had promoted the reservoir plan. In 1979, a study by the Brookings Institute called this achievement the paradigmatic exemplar of policy change by citizen action.²⁸

The graduate student attributed his environmental awareness, and his determination to defeat the army proposal, to a strong sense of place. His was the fifth generation of his family to have lived in the area since they immigrated to the United States about 1850. Many of them had been farmers and small town businessmen and they had inculcated a strong sense of responsibility to their adopted place. The example of the Sangamon River illustrates how these ideas apply to environmental problems today; it also illustrates the positive role that science can have on policy, if it is developed and applied from a local, place-oriented perspective and in service of local, protectionist values. In the best case, locally based values can motivate a deep understanding of valued places. When coupled with skillful use of political processes, it is possible for locally based values to restrain forces that attempt to impose development from centralized power sources.

We can also speculate that locally motivated, locally originated, mission-oriented science, when combined with a strong sense of place and local activism, can take the place of local myths as a determinant of policy. Science that is used as a "story" about how a culture has negotiated a lasting niche in an ecosystem guides the development of modern ideas of limits. This line of reasoning suggests two differing functions of science depending on whether science acts in the service of centralized authority, or whether it acts as one element in a local struggle to formulate ecological limits imposed by concern for future generations. Science used in the service of bureaucratic goals of centralized governments can cause homogenization and destruction of local flora, fauna, and ecological systems. When science serves local values, however, it is science employed from a local perspective, and seeks to protect local variations as valuable markers of place. Note how this observation supports and complements our earlier argument that choices regarding perspective and scale are intertwined with questions of social values.

²⁸ Daniel A. Mazmanian and Jeanne Nienaber, *Can Organizations Change? Environmental Protection, Citizen Participation, and the Corps of Engineers* (Washington, D.C.: Brookings Institution, 1979), pp. 19–24. The local citizen is Bruce Hannon.

(e) *Some Lessons from these Examples.* In opposition to these locally determined values, the values that are imposed from the center are usually based on authority. These values are determined by abstract principles or distant markets more than local appropriateness and they flow down a political and geographical hierarchy. The goals of nationhood can make it politically important to remove local variation. In modern nation states, including the federal system in the United States, if local values conflict with values of the center, the former must give way.

Taking local values seriously may also call into question the contemporary wisdom favoring free trade, international capital markets, and the pervasive search for competitive advantage.²⁹ The world economy, as currently organized, exhibits strong centralist tendencies and may be incompatible with protecting locally developed values and the cultural practices local people have evolved for living as a human community within a distinctive, local ecological community. According to this analysis, we are tending toward a global victory of *epistēmē* (theory) over *technē* (local practice) with all of the attendant calamities.³⁰ The ramification of such a victory is often seen today at the community level, as government planners limit access of local, indigenous groups to tribal lands, destroying in turn the traditional, local adaptations to specialized ecological conditions.

In his revealing monograph on the ecological history of colonial New England, William Cronon demonstrates that, while Native Americans had always “managed” the landscape, the scale of their changes was limited by the tools available to them and by their decentralized culture and nomadic patterns of resource use.³¹ The imposition of a European pattern of ownership, the introduction of money, and the idea of “cash crops” that can be sold in response to world demand, all tended to increase the extent to which values were forced downward through a geographically defined hierarchy. Local communities cannot

²⁹ See Herman Daly and John Cobb, *For the Common Good* (Boston: Beacon Press, 1989), pp. 209–35, and Herman Daly, “Problems with Free Trade: Neoclassical and Steady-State Perspectives,” in Durwood Zaelke, Paul Orbuch, and Robert F. Housman, eds., *Trade and the Environment: Law, Economics, and Policy* (Washington, D.C.: Island Press, 1993).

³⁰ Stephen Marglin, “Losing Touch: the Cultural Conditions of Worker Accommodation and Resistance,” in Frederique Marglin and Stephen Marglin, eds., *Dominating Knowledge* (Oxford: Clarendon Press, 1990); Gadgil et al., “Indigenous Knowledge for Biodiversity Conservation.”

³¹ William Cronon, *Changes in the Land: Indians, Colonists, and the Ecology of New England* (New York: Hill and Wang, 1983). Cronon’s book was only the first of a new genre of ecological histories, each entry of which showed how the imposition of European land-use patterns and styles of ownership destroyed traditional systems of land and resource use in colonized areas of the New World, transforming the landscape in the process. See, for example, Timothy Silver, *A New Face on the Countryside: Indians, Colonists, and Slaves in South Atlantic Forests, 1500–1800* (Cambridge, U.K., New York: Cambridge University Press, 1990); Ramon A. Gutierrez, *When Jesus Came, The Corn Mothers Went Away* (Stanford: Stanford University Press, 1991). Also see Gadgil and Berkes, “Traditional Resource Management Systems,” and Guha and Gadgil, “State Forestry and Social Conflict in British India,” for documentation of similar historical patterns in India.

control economic demand as expressed in world markets; a commitment to exports to bring in foreign exchange greatly narrows the options for development opportunities in less developed regions. The result was homogenization of land use—especially draining of wetlands for hay and grain fields—and destruction of social and biological diversity.

Note that Cronon's history is yet another example of how a centralized value structure can impose itself on the land, destroying diversity of the landscape by pursuing foreign markets. We can call this "top-down" valuation of nature, and associate it with colonialism and exploitation across political boundaries. We contrast it with "bottom-up" valuation which originates locally. Centralism and top-down authority can be seen as forcing values downward through a hierarchy, as constraints are enforced from above. Localism and resistance to enforcement of centralized authority in resource use can be seen, however, as fighting to force values up through the hierarchy.

According to our multiscale theory, creativity, diversity, and sustainability result from energy/values being forced up the hierarchy in the face of constraints that are evident at larger scales. The question is whether the constraints will be voluntarily recognized, formulated, and accepted at each level, or whether they will be imposed from above, as in the Japanese shogunate. Or, will they be understood by citizens who view their environment from a local viewpoint but see also the importance of protecting larger systems and processes, and of dealing with problems that require attention on larger, regional and national scales as well?

We have developed a general approach to environmental management based on a sense of place; this approach, which emphasizes locally developed values, myths, and cultural practices, gives rise to a distinctive approach to environmental valuation. By positing spatial discounting as an analogue to temporal discounting, we have constructed rough mental models of the space in which citizens form their environmental values. We therefore define the task of understanding sustainability as that of developing many local, but ultimately integrated, sustainability ethics, each one of which embodies sensitivity to the particularities of local cultural adaptations and to the wisdom of various uses of local ecosystems. The proposed approach expresses, operationalizes, and supports a growing consensus that ecosystem management must include significant attempts to engage local communities in setting goals and discussing proposed "experiments."³²

³²Our approach is therefore complementary to the adaptive management approach as proposed and developed by the ecologist, C. S. Holling and other colleagues. For discussion of the socio-political aspects of adaptive management, see, especially, Kai Lee, *Compass and Gyroscope* (Covelo, Calif.: Island Press, 1993), and Lance Gunderson, C. S. Holling, and Stephen S. Light, *Barriers and Bridges to the Renewal of Ecosystems and Institutions* (New York: Columbia University Press, 1995).

IV. EMBRACING THE NIMBY IN EACH OF US

What, then, are we to make of the NIMBY syndrome and the local sentiments associated with it? While we cannot deny that NIMBY sentiments can express themselves in overly selfish and shortsighted ways, we have nevertheless argued that a successful approach to sustainability must be built upon these sentiments which express a local “sense of place.” Our theory, indeed, implies that a preference for the near is inherent in human behavior. The goal, then, should be to build an approach to environmental policy that takes NIMBY sentiments into account and channels those sentiments toward a policy of environmental protection that is developed from many local perspectives.

Using our theory as a guide, we are able to draw two general distinctions that help us to separate legitimate exercise of local power from cases where local obstructionism results in environmental policies that undermine the overall public good and local community values.

(1) It is important to distinguish *economic* NIMBYism from true, *place-oriented* NIMBYism. If efforts to stop sitings of undesirable land uses are based on economic motives only, losses to surrounding landowners can be economically compensated. These are losses that will be perceived by other buyers and will affect the resale value of their property. When NIMBYism degenerates into a game to ensure adequate compensation—if, for example, landowners are fully willing to take the best financial settlement and relocate on a comparable property far away—then they are economic, or “defensive” NIMBYs at best. This behavior does not rest on an attitude of protection of this specific place for its specific charms; it is a *self*-protective motive. The interest behind it is in protecting the “investments” of the individual, investments that are as well protected by a generous payoff as by protection of the integrity of the place in question. If, however, NIMBYs show no interest in compensation, but rather indignation that their home will be violated by decisions made far away, we are more likely to consider their local sentiments to be justified. Our theory helps to understand the distinction between defensive and positive NIMBYism, because it explains the importance of positive sense-of-place values in moving the NIMBY sentiment beyond mere negativism. If the NIMBY sentiment is accompanied by an active search for, and articulation of, positive, local sense-of-place values, then we regard it as headed in the right direction. Indeed, a positive sense of place might be understood as values expressed for natural characteristics of a habitat that cannot be attributed to economic use or exchange value.³³

(2) Our theory, which integrates local sentiments into larger-scale systems, also allows us to distinguish two, importantly different versions of the NIMBY attitude toward surrounding places and municipalities. We distinguish:

³³ See Bryan Norton and Bruce Hannon, “Democracy and Sense of Place Values,” under revision.

NIMBY A: You may not do x in my backyard; therefore, do x in someone else's backyard.

NIMBY B: You may not do x in my backyard; furthermore, if you cannot find some other community that democratically chooses to accept x , then x will cease.

NIMBY A and NIMBY B are both locally based. NIMBY B, however, differs from NIMBY A in that the former possesses a fuller sense of place, which we have defined as having two inseparable elements. In the words of Tuan, A-type NIMBYs exhibit a sense of place, but no sense of space around the place. In moral and political terms, they have not accepted that their right to self-determination is, if it is a "right" of *their* community, also a "right" of *every* community; and conversely, only if self-determination is the right of every community is it the right of their community. Although environmental policy must be local in the sense that each place accepts responsibility for the integrity of its place, local sentiments must be tempered with a sense of surrounding space and inevitable interactions with other regions in addressing environmental problems, and therefore must respect the environmental concerns of other local communities. Because our locally based theory and approach recognizes that the urge to protect one's home place is universal, fairness requires that rejection of a facility in one locale must be accompanied with skepticism of the centralized policies that impose unwanted land uses on any and all communities. Local communities cannot insist on their own self-determination and consistently deny that right to other communities which feel similarly, but from distinct spatial perspectives. This ethical principle provides a moral rule, analogous to the golden rule in human ethics, a sort of universalizability on the community level.

V. CONCLUSION

Our theory suggests no less than an about-face in current trends in environmental planning and policy formation. What we are saying, prescriptively, is that we should, whenever possible, shift responsibility for resource use to local levels, and accompany this change with an active and ongoing effort—such as many locally-based ecosystem management plans—to build positive sense of place.³⁴ Nevertheless, we also recognize that making an about-face in the flow

³⁴Our approach leads us to expect that a culture of high mobility will be less likely to protect the ecological context that gives meaning to local cultural adaptations. See Sagoff, "Settling America," for a helpful general discussion. But we wonder, optimistically, if it may be possible to encourage a stronger sense of place in local communities, and greater responsibility for local resource use, through public participation in ecosystem management plans and through public education and dialogue. See Norton and Hannon, "Democracy and Sense of Place Values." Clearly more research and discussion is warranted here.

of environmental values and decision making will require great wisdom, an extraordinary educational effort, and no little time. The important point is that we now begin to think more locally and recognize that the goal of a national environmental policy is to reduce the number of centralized decisions that cannot be implemented in a fully democratic way at the local level. We propose an end to the *ex cathedra* pronouncements of the environmental expert, and urge scientists to emphasize study of local ecosystems and participation in environmental management projects. The time necessary to retool laws and institutions in this direction will at least be matched by the equally slow process of environmental education necessary to ensure that, as local governments and organizations accept responsibility, they will also have built a strong sense of responsibility for the space around their place. It also implies that the formation of environmental policy goals should include a significant element of public education and, by using scientific-conceptual models that are informative to lay persons, it should strive to generate a sustainability path of development from the bottom up. The burden of environmental managers, then, is to communicate to the public and to simultaneously learn from the public, in the development of locally based models for the articulation of local values. This interaction between the public and managers, which is exemplified in the best examples of community-based ecosystem management programs, must be locally driven and dynamic, and it must provide an open and ongoing forum for the explicit examination and articulation of locally based values.