Philosophical Frontiers
ISSN 1758-1532
Vol. 4, Issue 1 (2009)
pp. 85-107

Dewey and Leopold on the Limits of Environmental Justice

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ABSTRACT: Environmental justice refers to many things: a global activist movement, local groups that struggle to redress the inequitable distribution of environmental goods (and bads), especially as they affect minority communities, as well as a vast body of interdisciplinary scholarship documenting and motivating these movements. In the past three decades, scholarly debates over what environmental justice requires have been dominated by a discourse of rights. While this rights talk is unlikely to disappear, I argue for an alternative framing of environmental justice issues in terms of two ethics. These paired ethics are inspired by two American thinkers, one who was specifically concerned with ecological matters and the other less so, but equally devoted to elaborating the advantages of experimental problem-solving: Aldo Leopold and John Dewey, respectively. In A Sand County Almanac, Leopold articulated an ethic of restraint. Individuals bear personal responsibility for promoting beauty, stability and diversity in their relations with the land. Dewey proposed an ethic of control, whereby experimental inquiry permits communities to gain greater control over their natural environment and experimentally determine the content of their shared norms. In some respects, Dewey's ethic of control resembles what Leopold calls the 'outlook of a conqueror', not that of a 'citizen in a land community'. However, if we adopt even a weakly anthropocentric view of human-environment interaction, then exerting some degree of control over one's natural environment becomes essential for survival and flourishing. Still, pragmatists concerned with environmental justice issues can learn important lessons from Leopold's ethic of restraint, which extends not only to the land, but also to the oceans and the atmosphere. I demonstrate this point by appealing to the works of J. Baird Callicott and Larry Hickman, as well as to proposals to reduce the anthropogenic inputs (especially global greenhouses gases) responsible for global climate change through the intentional manipulation of climate systems—often called "geoengineering."

> Environmental justice is a political movement concerned with public policy issues of environmental racism [or racially discriminatory enforcement of environmental regulations and law], as well as a cultural movement in issues of ideology and representation.
>
> –Julie Sze[1]

Introduction

Environmental justice refers to many things: a global activist movement, local groups that struggle to redress the inequitable distribution of environmental goods (and bads), especially as they affect minority communities, as well as a vast body of interdisciplinary scholarship documenting and motivating these movements. In the past three decades, scholarly debates over what environmental justice requires have been dominated by a discourse of rights. While this rights talk is unlikely to disappear, I argue for an alternative framing of environmental justice issues in terms of two ethics.[2] These paired ethics are inspired by two American thinkers, one who was specifically concerned with ecological matters and the other less so, but equally devoted to elaborating the advantages of experimental problem solving: Aldo Leopold and John Dewey, respectively. In A Sand County Almanac, Leopold articulated an ethic of restraint. Individuals bear personal responsibility for promoting beauty, stability and diversity in their relations with the land. Dewey proposed an ethic of control, whereby experimental inquiry permits communities to gain greater control over their natural environment and experimentally determine the content of their shared norms. In some respects, Dewey's ethic of control resembles what Leopold calls the "outlook of a conqueror," not that of a "citizen in a land community."[3] However, if we adopt even a weakly anthropocentric view of human-environment interaction, then exerting some degree of control over the natural environment becomes essential for human survival and flourishing. Still, pragmatists concerned with environmental justice issues can learn important lessons from Leopold's ethic of restraint, which extends not only to the land, but also to the oceans and the atmosphere. I demonstrate this point by appealing to the works of J. Baird Callicott and Larry Hickman as well as some proposals to reduce the anthropogenic inputs (especially global greenhouses gases) responsible for global climate change.

2. The Environmental Justice Literature

In both academic and non-academic circles, environmental justice denotes those efforts to

1 Sze (2002), 163.

2 This approach draws upon what sociologists refer to as "social movement framing theory." "From this perspective, social movements are not viewed merely as carriers of extant ideas and meanings that arise automatically out of structural arrangements, unanticipated events, or existing ideologies. Rather, movement actors are viewed as signifying agents actively engaged in the production and maintenance of meaning for constituents, antagonists, and bystanders." Benford (2005), 37-8.

3 Leopold (1966), 62.

redistribute environmental burdens, such as crime, pollution, contamination, flooding, etc., which are disproportionately borne by historically marginalized groups, including women, racial minorities, the poor and inhabitants of the global South.[4] According to Adamson, Evans and Stein, "[e]nvironmental justice movements call attention to the ways disparate distribution of wealth and power often leads to correlative social upheaval and the unequal distribution of environmental degradation and/or toxicity."[5] On another account, "EJM [Environmental Justice Movement] activists claim that the burden of environmental risk is disproportionately allocated to working class, poor, and minority communities, yet no statute outlaws discrimination on the basis of class or income."[6] Mirroring environmental activism is a growing scholarly literature authored by environmental scientists, social scientists and philosophers, and in some cases, direct collaborations between activists and academics.[7]

Instead of embracing traditional preservationist/ecological notions of nature and environment, environmental justice advocates and scholars appeal to more expansive definitions, especially those that integrate social justice concerns. According to one scholar, "[e]nvironmental justice defines the environment as a site where people live, work, and play. This definition rejects the mainstream representation environment—as empty green space—as ahistorical, classist and antiurban."[8] Also, "nature" is not limited to what we find in ecosystems, biomes, the Earth's wilderness and atmosphere, but extends beyond them to cities, landfills, toxic waste sites, minority communities and sites of race, gender and class discrimination. According to Robert Figueroa, "people of color and the poor are collectively the greatest sufferers of environmental injustices, and activism and scholarship should be working toward the understanding and amelioration of these injustices."[9] Many members of these communities face disproportionate risks from environmental pollution and have been historically excluded from the environmental movement. Despite the willingness of environmental justice scholar to reconstruct the orthodox meanings of

4 It is difficult to give a unified definition of environmental justice, largely because of the movement's mixed roots in environmental activism and interdisciplinary academic scholarship. The U.S. Environmental Protection Agency (2009) describes it as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations, and policies. [. . .] It will be achieved when everyone enjoys the same degree of protection from environmental and health hazards and equal access to the decision-making process to have healthy environment in which to live, learn, and work." Environmental historian Christopher Sellars understands environmental justice as "fusionist environmental and social history" and "new ways of seeing society's environmental legacies" that emerged from "paradigmatic struggles . . . during the late 1970s and early 1980s, from Love Canal to Warren County, North Carolina." Sellars (2008), 177-8.

5 Adamson, Evans and Stein (2002), 5.

6 Cable, Mix and Hastings (2005), 62.

7 According to Robert Figueroa, "[s]truggles for environmental justice have produced a correspondent scholarship, complete with conferences, articles, books, and curricula. Some schools now have concentrations in environmental justice, many environmental studies programs teach environmental justice explicitly or implicitly, and the production of academic material; in environmental justice grows at an impressive rate." Figueroa (2002), 311. Cable, Mix and Hastings identify four kinds of collaborations between environmental justice activists and academics: (i) with students, (ii) in university-sponsored health studies and (iii) university researchers who serve as technical experts and (iv) traditional research on EJ movements conducted with the consent of activists. Cable, Mix and Hastings (2005), 68-70.

8 Sze (2002), 164-5.

9 Figueroa (2003), 32.

nature and environment, "the environmental justice literature," on Julie Sze's reading, "generally does not substantively address the historical constructions and cultural discourses of mainstream environmentalism's representations of 'nature.'"[10] So, environmental justice scholars attempt to blur the boundaries between natural and built environments, between human oppression of non-human nature and the same oppressive treatment of marginalized communities, as well as between human injustices committed against ecosystem health and similar injustices inflicted against the well-being of human minorities.[11]

Since a comprehensive survey of the voluminous environmental justice literature would take us too far afield, I instead focus on five fairly representative movements, each of which, individually, reveals a different dimension of environmental justice (hereafter EJ) and all of which, collectively, divulge the methods and subject-matter of the EJ literature.[12]

> 1. Toxicity, race and environmental racism: 60% of African-Americans in the continental U.S. reside in areas proximate to a hazardous waste landfill.[13] This statistic reflects a policy of siting such facilities in areas where residents show the least resistance, the lack of political efficacy among poor communities of color and patterns of institutionalized racism.[14] In 1982, members of a predominantly African-American community in Warren, North Carolina, protested the decision to locate a toxic waste landfill facility nearby.[15] The "Cancer Alley" region of Louisiana, an 85-mile stretch of the Mississippi River between Baton Rouge and New Orleans, is lined with 125 petrochemical company facilities, releasing pollutants that disproportionately affect poor African-American communities in the region.[16] In 1987, the report Toxic Wastes and Race in the United States revealed a strong correlation between one's identity as a racial minority and living in close proximity to commercial hazardous waste facilities.[17] This report introduced the expression "environmental justice" into the vocabulary of politicians, scholars and activists, and influenced President Bill Clinton's Executive Order on Environmental Justice. Besides introducing these concepts and causing a policy shift, the report spawned an extensive literature, mainly in the field of sociology, documenting the extent to which existing environmental rules and regulations sanction patterns of racial discrimination—or what is termed "environmental racism."[18]

10 Sze (2002), 166.

11 According to Pellow and Brulle, "[t]he EJ movement has sought to redefine environmentalism as much more integrated with the social needs of human populations, and, in contrast, with the more eco-centric environmental movement, its fundamental goals include challenging the capitalist growth economy as well." Pello and Brulle (2005), 3.

12 Missing from the list are the movements against manufacturers of genetically-modified foods, environmental risks to low-paid workers, as well as violence against women and enslaved racial populations. Gonzalez (2007). Daboub (2009). Schrader-Frechette (2002), 135. Reuther (1993). MacGregor (2004).

13 Schrader-Frechette (2002), 12.

14 Figueroa (2003), 33. Hunold and Young (1998).

15 Cole and Foster (2001), 19-21. Hofrichter (1993).

16 Schrader-Frechette (2002).

17 Commission for Racial Justice-United Church of Christ (1987). Rhodes (2003), 14-5.

18 Bullard (1993). Westra and Lawson (2001)

2. Indigenous communities, toxicity and displacement from native lands: Indigenous groups often fall victim to environmental injustices, particularly at the hands of uranium mining operations, the logging industry and government agencies undertaking radioactive experiments. In Point Hope, Alaska, the Atomic Energy Commission and the United States Geological Survey conducted tracer experiments, depositing radioactive materials in the local waterways and soils, which contaminated the food supply and resulted in a "sharp increase in the diagnosis of cancer" among Alaska native peoples living nearby.[19] From 1954 to 1968, mining companies depleted and contaminated the water supply of the Navajo tribe, defending their actions on the grounds that the Federal Water Pollution Control Act did not protect Native American lands.[20] Likewise, logging and mining interests have degraded watersheds in Colorado's south-central San Luis Valley, destroying communal irrigation ditches, or acequias, of local hispano mexicano farmers, that previously preserved the region's biodiversity.[21]

3. Minority groups and their historical exclusion/marginalization from the environmental movement: The environmental movement has from its outset been composed of hierarchically structured organizations, such as the Sierra Club, the Wilderness Society and the Environmental Policy Institute, whose paid members are predominantly white middle- and upper-class males. Indeed, Reverend Benjamin Chavis, who coined the term "environmental justice," complained of a long "history of excluding people of color from leadership in the environmental movement."[22] 1991 saw the first effort to correct this historical exclusion of racial minorities from the movement when three hundred representatives from minority communities throughout the Western hemisphere met in Washington, D.C., as part of the First National People of Color Environmental Summit, and drafted a list of seventeen principles that would form the bedrock of the contemporary environmental justice movement. While the environmental justice movement overlaps to some degree with two other branches of the environmental movement—the professional environmental movement and the anti-toxics movement (the leadership and membership of which are still not highly diversified)—it has come to differentiate itself in terms of its objective ("equitable distribution of environmental threats and environmental privileges"), tactics ("demonstrations, petitions, lobbying elected officials, letter writing . . . and occasional litigation"), and constituency ("working-class, impoverished, and minority residents of contaminated communities").[23]

4. Regional treaties, economic globalization and their effects on ethnic and impoverished communities: An extensive literature has developed around the consequences of the North American Free Trade Agreement (NAFTA) on poor and racially exploited groups, especially in the global south. Local protests against NAFTA and other regional economic treaties often take on a global dimension. For instance, sociologists, political scientists and popular writers have examined the mobilization of indigenous peoples by the Zapatistas movement in Chiapas, Mexico, and the global support the movement

19 Edwards (2002), 107.
20 Schrader-Frechette (2002).
21 Pena (2002), 58-61.
22 Cited in Adamson et al (2002), 4.
23 Cable, Mix and Hastings (2005), 60-1.

gained through publication of its leaders' writing on the internet.[24] Also, writers of fictional novels have brought attention to the plight of groups economically displaced by NAFTA—such as Karen Yamashita's Tropic of Orange.[25]

5. Climate change and its effects on inhabitants of the global south: Economic disparities between the rich nations of the Global North and the poor nations of the Global South have given rise to coordination difficulties. Representatives of poorer nations argue that they are entitled to release GHGs at the level of richer nations before they are asked to reduce emissions to a lower level, for they have a right to development. Richer nations claim that regulation of GHG emissions should be distributed equally.[26]

3. A Deweyan Critique of EJ's Discourse

From the environmental justice literature emerge two hallmark discourses: (i) victimization and (ii) rights. The discourse of victimization is intimately tied to the subject-matter of EJ: minority and marginalized communities burdened with environmental risks placed on them by more powerful interests and socioeconomically advantaged groups. Robert Figueroa connects the discourse of victimization to the emotion of despair:

> Helplessness looms in many cases of environmental justice. The remedies of the injustices are often arguably lame compromises of human life and socioenvironmental values against political and economic agendas. Even victories can appear Pyrrhic at best, given the constant struggle against related injustices.[27]

While the emphasis on victims and despair is effective for raising consciousness and mobilizing opposition to the powers that be, it also betrays one of the distressing features of activism generally: i.e. an overriding negativism. A Deweyan alternative to this EJ's discourse of victimization and despair would be a discourse of empowerment and hope, a conversation between activists and scholars about how to improve human capacities and social conditions—in short, a concerted effort toward reform. This alternative discourse would be based on Dewey's commitment to meliorism. "Meliorism," Dewey writes in Reconstruction in Philosophy, "is the belief that the specific conditions which exist at one moment, be they comparatively bad or comparatively good, in any event may be bettered."[28]

24 Hayden (2002). Klein (2002). Vodovnik (2004).
25 Sze (2002).
26 Vanderheiden (2008a, 2008b). Bell (2004).
27 Figueroa (2002), 325-6.
28 Dewey (1996), MW 12:182. Citations follow the conventional method, LW (Later Works) or MW (Middle Works) or EW (Early Works), volume: page number.

A discourse of rights is standard within the environmental justice scholarship. Indeed, the editors of The Environmental Justice Reader define "environmental justice as the right of all people to share equally in the benefits bestowed by a healthy environment."[29] Recent debates in justice theory revolve around two paradigms: (i) distributive justice, whereby rights and liberties, material goods and burdens are distributed and redistributed in accordance with alternative principles of justice (and fairness), and (ii) the politics of recognition, whereby distributive matters are secondary to demands for self-determination, identity/culture recognition and democratic engagement.[30] Since the distributive justice paradigm dominates the debate, most environmental justice scholars have eagerly embraced the dominant paradigm and its closely associated discourse of rights. According to Kristin Schrader-Frechette, "[d]istributive justice is essential to the search for environmental justice because it requires a fair or equitable distribution of society's technological and environmental risks and impacts."[31] However, EJ activists and scholars reject the move made by some distributive justice scholars to reduce the racial causes for environmental injustice and discrimination to classist and socioeconomic causes.[32] While analytically separable, race and class, or being a member of a racial minority and being impoverished, are interconnected in that they both tend to signal who bears the greatest burden of environmental disadvantages and risks.

Possessing a right implies, of course, that others have a duty not to infringe on or interfere with the right-holder's prerogative—e.g., to speak, assemble, worship, or in the case of most environmental justice issues, to access environmental goods. When individual and/or collective rights conflict, just outcomes require recourse to fair procedures and legalistic arguments. Rights also operate as protections or "trumps" against the decisions and policies approved by democratic majorities.[33] When a conflict of rights arises, the more basic right (e.g. a right to bodily security) should be given priority, or greater weight, relative to the non-basic or derivative right (e.g. a right to public education).[34] Why? We live in a world where many resources crucial for survival are relatively scarce. Given these non-ideal circumstances, it is only just to satisfy more basic rights to security and subsistence before satisfying more expansive rights to human flourishing. As David Hume's analysis attests, requirements of justice only emerge against a background of limited resources.[35]

What is the source of these rights analyses in the environmental justice literature? Contemporary

29 Adamson, Evans and Stein (2002), 4. The emphasis is mine.

30 Figueroa (2003). Fraser (1997). Taylor (1994).

31 Schrader-Frechette (2002), 24.

32 For instance, EJ scholar Robert Figueroa criticizes efforts by distributive justice scholars Vicki Been (1995) and Peter Wenz (2001) "to avoid focusing on racism and to look instead at socio-economic character of individuals and collectivities involved in environmental justice issues." Figueroa (2003), 33. Figueroa believes that "the debate that contrasts the role of race and racism against class and classism" and contests which is the true cause of environmental injustice is largely superficial, since "just about every scholar agrees that race and class have interpenetrating features." Figueroa (2002), 315.

33 Dworkin (1977), 21.

34 Henry Shue insists that basic rights to security and subsistence should be prioritized before non-basic rights to human flourishing because without the former, the pursuit of the latter would be hopeless: "When a right is genuinely basic, any attempt to enjoy any other right by sacrificing the basic right would be quite literally self-defeating, cutting the ground from beneath itself." Shue (1999), 97.

35 Hume (1948), 55-6.

Kantians, such as Rawls and Habermas strictly distinguish the good from the right.[36] Whereas the good embodies those reasonable life plans of individuals (Rawls) or the ethical commitments of community members (Habermas), the right is constituted by those just principles reflective of an "overlapping consensus" (Rawls) or those just outcomes from a fair process of rational discourse (Habermas). According to many neo-Aristotelians, Rawls and Habermas sidestep thick ethical descriptions of the good by privileging the right and articulating it in deontological terms, that is, as a categorical duty of rational and autonomous agents. Communitarians and civic republicans criticize contemporary Kantians, especially Rawls, for ignoring the rich context of community life, its traditions, culture and public morals, in their thin accounts of the human good.[37]

In his Ethics, Dewey strikes a balance between the positions of contemporary Kantians and neo-Aristotelians, understanding the difference between the good and the right transactionally, that is, as a matter of degree or emphasis, not a matter of strict demarcation:

> Justice as an end in itself is a case of making an idol out of a means at the expense of the end which it serves . . . [J]ustice is not an external means to human welfare but a means which is organically integrated with the end it serves. [. . .] There is . . . an inherent difficulty in the conception that justice can be separated from the effect of actions and attitudes upon human well-being.[38]

Similar to the means-end continuum, Dewey's continuum of the good and the right does not privilege the right over the good, as an intrinsically rather than instrumentally valuable category. Instead, the right is just a more expanded perspective from which to view the good, a perspective Dewey refers to as that of the "ideal spectator," whereby an agent examines "his proposed act through the eyes of this impartial and far-seeing objective judge."[39] From this vantage, an individual with a "broaden[ed] . . . conception of the Good" can consider the interests of all those affected, not just himself, so that "nothing is good for himself which is not also good for others."[40] Thus, factors within the broader social context, such as moral norms and cultural cues, may serve to pressure agents toward accepting a more expanded perspective on what constitutes the good.

In the environmental justice literature, rights analyses produce an overly legalistic and adversarial path to redressing inequitable distributions of environmental goods and bads, benefits and burdens. Commonly, the outcomes of these disputes will have winners and losers—in policy parlance, they are zero-sum. Moreover, outcomes of rights conflicts, since they are subject to ongoing legal contestation, are rarely ever settled for long. Such analyses also tend to reinforce a false dichotomy between the rights of minorities and the rights of majorities. In a Deweyan spirit, rights-holders should broaden their perspectives and imagine others' needs and interests (i.e. their good) in order to reach mutually beneficial outcomes through a shared process of inquiry.

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36 See Rawls (1971, 1996, 2001). Habermas (1990, 1996a, 1996b).

37 Sandel (1996) characterizes Rawls's conception of personhood in the Original Position (where agents have no knowledge of their personal traits) as that of the "unencumbered self," and argues that humans are instead inextricably situated within the context of their community.

38 Dewey (1996), LW 7:249-50.

39 Dewey (1996), LW 7:246.

40 Dewey (1996), LW 7:225.

So, in foregoing the standard rights analysis, the inquirer is not forced to uncritically endorse the politics of recognition or communitarianism, the position that the community's basic values even when they offend the prerogatives of individuals and insular minorities.[41] Indeed, the two standard paradigms present a false dichotomy, for instance, between conceiving collectivities either in terms of economic class or in terms of cultural signifiers, such as race, gender and sexuality.

I want to suggest that most environmental justice issues are more effectively arbitrated by recourse to two ethics that are continuous with each other, not mutually exclusive.[42] Since the discourse of rights will surely persist, I do not take the unrealistic position that it should be altogether displaced by this alternative framing of environmental justice issues. Instead, my point is simply that EJ activists and scholars should push beyond the discourses of victimization and rights, just as they have enlarged mainstream definitions of nature and environment, to consider more wide-ranging political-ethical commitments.

4. Two Kinds of Ethics—Control and Restraint

I believe that a better way to frame environmental justice issues than as narratives of victimization and rights conflicts is in terms of two ethics. These two ethics are intended to be realized along a continuum, in degrees, not bifurcated into non-overlapping universes of discourse. On the one hand, John Dewey's model of experimental inquiry applied to environmental problems exemplifies an ethic of control. On the other, Aldo Leopold's attention to land and Earth heath, as well as the need for humans to become responsible members of biotic communities, balances an ethic of control with an equally forceful ethic of restraint.

4.1. Dewey and an Ethic of Control

For John Dewey, experimental inquiry manifests in a matrix of knowing and acting events, involving the framing of a problem, proposing hypotheses, testing them, observing results and treating the experimental outcomes as fallible and revisable in the light of future testing. Experimental inquiry can tell us why the extinction of a species can lead to adjustment by other species more suited to exploit a niche: "As some species die out, forms better adapted to utilize

41 See Ralston's (2008) argument that while Dewey is committed to a democratic way of life, the significant differences between his democratic theory and Rawls's political liberalism does not therefore make it a close relative of Sandel's communitarianism.

42 This position reflects Dewey's long-standing effort to overcome dualistic thinking, "divisions and separations that were . . . a consequence of a heritage of New England culture, divisions by way of isolation of self from world, of soul from body, of nature from God." Dewey (1996), LW 5:153. It also reflects Nancy Fraser's distinction between substantive dualisms, whereby the separation is permanent, exclusive and between two reified domains, and perspectival dualisms, whereby the separation is temporary, continuous and between "two analytic perspectives." Fraser (1996), 20-3.

the obstacles against which they struggled in vain come into being."[43] According to Dewey, "[l]ife is a self-renewing process through action upon the environment."[44] So, by extension, the life of the human experimental inquirer is one of exerting progressively greater control over the environment through the manipulation and testing of its conditions.

Of course, not all of life is composed of inquiry-driven, cognitively-intense knowing experiences. In what Dewey refers to as "the intellectualist tradition in philosophy" and the "quest for certainty," thinkers have "always identified degrees of logical adequacy with degrees of reality," certitude and stability.[45] Whether Hume, Kant, Descartes or Russell, philosophers in this tradition mistake the tentative and functional status of tools in inquiry for their ontological, fixed and stable, disposition in reality. Such tools include sense impressions, data, ideas, perceptions, meanings and norms. In turn, non-experimental techniques for "identifying degrees of logical adequacy with degrees of reality," such as correspondence, synthesis and coherence, replace experimental methods for testing the fitness of tools and resolving problematic situations. In the case of acting events, experimentalism involves a series of operations that transform the conditions of a problematic situation and hasten its resolution. Dewey explains how analysis reconstructs a situation for this purpose: "To break up the complexity, to resolve it into a number of independent variables each as irreducible as it is possible to make it, is the only way of getting secure pointers as to what is indicated by the occurrence of the situation in question."[46] Thus, analysis and other experimental operations are part of this matrix of knowing and acting events that together constitute the process of experimental inquiry.

Dewey reveals a generic pattern to experimental inquiry that widens its application beyond the domain of experimental science. His five-step method of inquiry was intended to apply to practical problems, or "problems of men," not solely to more specialized problems encountered in the laboratory. In the first edition of How We Think, Dewey spells out the five stages of experimental inquiry:

> Upon examination, each instance [of intelligent inquiry] reveals more or less clearly, five logically distinct steps: (i) a felt difficulty; (ii) its location and definition; (iii) suggestion of possible solution; (iv) development by reasoning of the bearings of the suggestion; (v) further observation and experimentation leading to its acceptance or rejection; that is, the conclusion of belief or disbelief.[47]

Dewey's examples of experimental inquiry include figuring out how to get to an appointment on time, identifying the function of a pole on the front of a tugboat and determining why bubbles go outside and inside of a cup once washed with hot water and placed upside-down on a kitchen counter.[48] So, while encompassing experimental science, inquiry is experimental in a more general sense, that is, involving experimental operations that can be applied to both common-sense and scientific problems: (i) observation, (ii) analysis, (iii) manipulation and (iv) reflection upon the

43 Dewey (1996), MW 9:5.
44 Dewey (1996), MW 9:4.
45 Dewey (1996), MW 10:336.
46 Dewey (1996), MW 10:342.
47 Dewey (1996), MW 6:236.
48 Dewey (1996), MW 6:234-5.

conditions and consequences of a problematic situation. Nevertheless, experimental science gives us reason for hope, reason to think that through technological innovation human civilization will experience never-ending progress. According to Dewey, "[e]xperiment[al science] developed in the seventeenth and succeeding centuries and became the authorized way of knowing when men's interests were centered in the question of control of nature for human uses."[49] Advances in experimental science and technology reaffirm an ethic of control, an ethic that aligns almost perfectly with Dewey's critical optimism, meliorism or hope for continued improvement through the exercise of intelligence, educative growth and democratic faith in science.[50]

4.2. Leopold and an Ethic of Restraint

For Aldo Leopold, one of the most well-known American ecologists and a contemporary of Dewey's, the boundary between environment and society cannot be strictly demarcated. Humans should act as members of the biotic community, caring for land and the creatures that inhabit it. Leopold distinguishes the ethic of control and the ethic of constraint in what he calls the "A-B cleavage": ""In each field [whether ethics or ecology] one group (A) regards the land as soil, and its function as commodity-production; another group (B) regards the land as biota, and its function as something broader."[51] In his famous land ethic, developed in the book A Sand County Almanac, Leopold states that a "land ethic changes the role of Homo sapiens from conqueror of the land community to plain member and citizen of it. It implies respect for fellow members and also respect for the community as such."[52] Moral consideration is thereby extended beyond the human species to the non-human environment, as humans become stewards, not exploiters, of its resources. Indeed, ecology for Leopold, "simply enlarges the boundary of the community to include soils, waters, plants, and animals, or collectively: the land."[53]

How does one treat ecological systems and biotic communities ethically when they do not speak human languages, act autonomously or make moral claims? Leopold clearly answers this

49 Dewey (1996), MW 9:210.

50 I would add one strong qualification to the claim that Dewey's theory of inquiry exemplifies an ethic of control. There is also evidence of a strain of what has been referred to as the "ethic of restraint," especially in his 1934 book *A Common Faith*. In that work, Dewey invokes the notion of "natural piety" which involves humans living in harmony with nature, and adopting a "just perspective in life," not controlling it for the sake of realizing selfish benefit at the expense of the voiceless other: "Natural piety is not of necessity either a fatalistic acquiescence in natural happenings or a romantic idealization of the world. It may rest upon a just sense of nature as the whole of which we are parts, while it also recognizes that we are parts that are marked by intelligence and purpose, having the capacity to strive by their aid to bring conditions into greater consonance with what is humanly desirable. Such piety is an inherent constituent of a just perspective in life." Dewey (1996), LW 9:18. I thank Stuart Rosenthal for making me aware of this crucial passage and important qualification to my account.

51 Leopold (1966), 258-9.

52 Leopold (1966), 240.

53 Leopold (1966), 239. This section of the paper closely follows Callicott's (2009) PowerPoint lecture at the Prescott City library as well as his presentation to participants in the National Endowment for the Humanities Institute on "Aldo Leopold and the Roots of Environmental Ethics," both on July 8, 2009. A fuller account of the Earth ethic will be given in Callicott's forthcoming book. Callicott gave me full permission to quote from the lecture's PowerPoint slides.

question in one of the most oft-quoted passages in A Sand County Almanac: "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise."[54] Cashing out what biological integrity, diversity and beauty mean in a concrete example will prove helpful here. Integrity is the capacity of all the interdependent elements of the ecosystem (e.g. soil, trees, deer and wolves) to work together. When one element (e.g. soil) is highly damaged by human activities, its poor state (or erosion) negatively impacts other elements that were once healthy (e.g. the root systems of trees) and, in turn, diminishes still other elements that consume it immediately and derivatively (e.g. the leaves that herbivores eat disappear, thereby lowering the population of herbivorous deer and finally reducing the numbers of predators such as wolves that consume the deer).[55] The stability of the ecosystem depends on this inter-connectedness. Without integrity and stability, biodiversity diminishes and, with it, the beauty that we, humans, delight in disappears.

According to J. Baird Callicott, Leopold's land ethic is pragmatically useful in some respects, but extremely limited in others. It is useful insofar as the object of ethically assessment is a small, fast, short-term and reversible problems that manifests in small- or mid-sized biotic communities, such point-source pollution, environmentally-unfriendly agricultural and forestry practices as well as degradation to ecosystems caused by recreational activities and local development (residential, commercial and industrial). However, it is severely limited with respect to addressing large, slow, long-term and possibly irreversible problems that occur on a global scale, such as climate change, mass extinction and the appearance of stratospheric ozone holes. While Callicott has always argued that Leopold embraced an eco-centric view in his land ethic, he this position when discussing the Earth ethic.[56] If we are to see Leopold as addressing these larger and drastically more consequential problems, then we must welcome a weakly anthropocentric view. Why? Because these are a special class of problems, especially global warming, which directly threaten the survival of the human species.

Even though global climate change was not an acknowledged problem during his lifetime, Leopold spoke to this class of larger-scale problems in a paper that was less widely read than A Sand County Almanac, entitled "Some Fundamentals of Conservation on the Southwest." To quote Leopold at length:

> There is not much discrepancy, except in language, between this conception of a living earth, and the conception of a dead earth, with enormously slow, intricate, and interrelated functions among its parts, as given us by physics, chemistry, and geology. The essential thing, for present purposes is that both admit the interdependent functions of the elements. . . . Possibly, in our intuitive perceptions, which may truer than our science and less impeded by words than our philosophies, we realize the indivisibility of the earth—its soil, mountains, rivers, forests, climate, plants, animals, and respect it collectively, not only as a useful servant but a living being, vastly less alive than ourselves in degree, but vastly greater than ourselves in time and space—a being that was old when the morning stars sang together, and, when the last of us has been gathered unto his

54 Leopold (1966), 262.

55 This example illustrates what Leopold calls "food chains" or "food pyramids" and the consequences when these suffer from human interference. Leopold (1966), 252.

56 See Callicott (1989, 1999, 2009).

fathers, will still be young.[57]

Leopold's "indivisibility of the earth . . . [that should be] respect[ed] . . . collectively, not only as a useful servant but as a living being," Callicott calls the "Earth ethic" as distinct from the "land ethic."[58] It is an idea which anticipates Lovelock and Margulis's "Gaia hypothesis" that the Earth is a living creature by half a century. Even though the Earth ethic displaces the land ethic, we have no less of a duty to be good citizens of the Earth as we do to be good citizens of the biotic community. However, given the vastness "in time and space" of the Earth's past and future existence, it is significantly more difficult for us to foresee or predict the consequences of our own activity on its health.

5. A Case Study: Global Climate Change

That global climate change is a problem of immense proportion, potentially threatening the continued existence of the human species, is a fairly uncontroversial proposition today. One would be relatively hard-pressed to find a well-informed individual who was unaware of the problem and some of its dimensions.[59] In the past fifty years, a near-consensus that global warming is a problem has developed among scientists and policy-makers. Vivid evidence has also emerged, such as (i) fast-melting glaciers and ice sheets, (ii) rising sea levels, (iii) the earlier bloom of plants, (iv) the destruction of animal habitats and (v) the interruption of migratory bird patterns. Unsurprisingly, these signs have generated fear that we will soon reach a catastrophic global tipping point. According to the authors of a recent article, the predicament can be compared to the task of reducing water in a bathroom tub: "As with a bathtub that has a large faucet and a small drain, the only practical way to lower the level is by dramatically cutting the inflow. Holding global warming steady at its current rate would require a worldwide 60-80 percent cut in emissions, and it would take decades for the atmospheric concentration of carbon dioxide to stabilize."[60] Carbon dioxide, once released into the atmosphere, stays there in excess of one hundred years. With the accretion of carbon dioxide and other greenhouse gases from anthropogenic (or human-created) sources, the Earth becomes a virtual Greenhouse. Efforts at remediation inevitably lag behind the warming trend.[61]

57 Leopold (1991), 88. Quoted in Callicott (2009).

58 Callicott (2009).

59 Nevertheless, skeptics do exist, and skeptical responses, such as denial and discounting in the face of uncertainty, are widespread. See Michaelson (1998), 85-6.

60 Victor et al (2009), 65.

61 Governments have responded to the global warming threat with regulatory projects and international political agreements to facilitate these projects. The two touchstone treaties regulating global climate change are (i) the UN Framework Convention on Climate Change (UNFCCC), signed in 1992, and (ii) the Kyoto Protocol, authorized in 1997. The UNFCCC unequivocally states that developed nations are responsible for "the largest share" of global greenhouse gas emissions, and that future action should aim to reduce emissions based on principles of "equity" and consistent with the "differentiated responsibilities and respective capacities" of parties to the treaty. Shortly thereafter, signatories to the UNFCCC drafted the Kyoto Protocol to make their general commitment to "protect the global climate system for the benefit of present and future generations" more concrete. In the protocol, parties agreed to establish targets for emission reductions, representing an overall five percent reduction relative to 1990 baseline

One possible response to global climate change, besides mitigation of greenhouse gas emissions and adaptation to the global consequences, is to intentionally manipulate the Earth's atmosphere—what is referred to as "geoengineering." Proposed geoengineering projects vary widely across at least three dimensions: design, scope and potential consequences. Here is a sampling of those that have been seriously considered and a brief, though by no means comprehensive, account of each:

> 1. Solar shields: One possible approach is to launch satellites or solar shields into orbit armed with moveable reflective plates. The result, as some computer models suggest, could be an 8% reduction in solar radiation reaching the Earth's surface.[62]
>
> 2. Carbon sequestration: One proposal is to capture and store carbon dioxide deep underground, miles under the surface of the Earth, so that the warming effect of this pollution is effectively removed.[63]
>
> 3. Ocean fertilization: Sometimes called the "Geritol cure," this project would involve depositing iron fillings in the ocean as a way to encourage the growth of phytoplankton, which in turn serve as a virtual carbon sink.[64]
>
> 4. Engineered weathering: Scientists propose to substitute hydrochloric acid for carbonic acid in the oceans, which would in theory speed up the process by which carbon dioxide is absorbed and stored in these water bodies.[65]
>
> 5. Stratospheric Chemical Injection: Proposed by Nobel Laureate Paul Crutzen and respected climatologist Tom Wigley, this response requires that sulfate aerosols be sent into the second major layer of the Earth's atmosphere, the stratosphere, in order to reflect sunlight and cool the Earth's surface.[66]
>
> 6. Launch reflective discs or particles into orbit: Sometimes referred to as the "sunscreen proposal," this project involves placing dust particles or even compact discs into the Earth's

emissions, but differentially affecting individual countries based on the level of development, with as much as an eight percent cut for some countries in the developed North and as much as a ten percent increase for others in the developing South. Due to a perceived bias in the treaty against developed nations, the U.S. Senate at first opposed its ratification, declaring that "meaningful participation" required developing countries to match reductions. In 2001 George W. Bush withdrew the U.S. from the Kyoto Protocol, marking the first case of out-and-out defection of a developed country from a GHG mitigation regime. Still, Europe has surged ahead with its own innovative, though initially faulty, emissions-trading regime, and there are signs that the U.S. will attempt a cap-and-trade scheme soon. Bales and Duke (2008), 80-81. Broder (2009a).

62 Robock (2008), 15. Victor, Morgan et al (2009), 68-9.

63 Robock (2008), 14-5.

64 Coale (1996).

65 Quick Climate Fixes (2009).

66 Crutzen (2006). Wigley (2006).

orbit in order to reflect solar radiation and cool the Earth's surface. The "Pinatubo Effect" alludes to the eruption of Mount Pinatubo in 1991, which had the same effect.[67]

7. Planting forests: Since deforestation removes a major carbon sink, reforesting the planet's surface with trees would have the effect of removing carbon dioxide from the Earth's atmosphere.[68]

8. Painting rooftops white: Though the most widely frowned upon, painting the rooftops of building white would reflect some of the sunlight back into the atmosphere and result in a small, though still valuable, reduction in atmospheric temperatures.[69]

Despite the hopeful tone of these geoengineering proposals, skepticism about whether they are scientifically sound, ethically defensible and politically feasible persists.[70]

The distinct advantage of geoengineering is that the difficulty of coordinating many nations' activities—what is often referred to as a "collective action problem"[71]—is not nearly so pronounced as with mitigation schemes. Richer nations can undertake projects without the consent of poorer nations; likewise, poorer nations may exercise their right to economic and industrial development, which often involves increasing levels of anthropogenic greenhouse gas emissions.[72] In keeping with Dewey's commitment to experimental inquiry, modifying the Earth's atmosphere for the sake of reversing the global warming trend requires painstaking research and development if it is to succeed. Dewey also insists that we commit ourselves to ensuring the welfare of future generations by preserving the natural environment because it is a necessary condition for our progeny and theirs to enjoy a suitable quality of life.[73] In addition, value considerations for Dewey cannot be detached from choices about adopting alternative technologies. According to one prominent Dewey scholar, "since nature retracts what is valued as quickly and as unpredictably as it proffers it, it is the job of intelligence, or technology, to ascertain whether what is valued is

67 Michaelson (1998), 76. Robock (2008), 14.

68 Fearnside (1999).

69 Cool Roofs and Title 24 (2009). Barringer (2009).

70 One of the most serious objections is that they might have devastating and irreversible, albeit unintended, consequences on the Earth's atmosphere, producing global cooling or even accelerated global warming. According to Alan Robock, the difficulty of global climate change might be, for the most part, political, that is, a daunting matter of coordinating state action through mitigation treaties and carbon trading schemes. "If global warming is a political problem more than it is a technical problem," he writes, "it follows that we don't need geoengineering to solve it." Robock (2008), 18. Geoengineering projects that aim to "combat or counteract the effects of changes in atmospheric chemistry" by unilaterally manipulating the planet's climate can face significant challenges from parties who fear that their interests will be harmed. National Academy of Sciences' Committee on Science, Engineering and Public Policy (1992), 433.

71 Olson (1965). Ostrom (1990). Hackatorn (1996). Hardin (2008).

72 Boran (2008). Vanderheiden (2008a, 2008b).

73 Dewey writes: "The best we can accomplish for posterity is to transmit unimpaired and with some increment of meaning the environment that makes it possible to maintain the habits of a decent and refined life. Our individual habits are links in forming the endless chain of humanity. Their significance depends upon the environment inherited from our forerunners, and it is enhanced as we foresee the fruits of our labors in the world in which our successors live." Dewey (1996), LW 14:19.

valuable [or valued after having undergone inquiry]; and if it be found to be such, to work to secure it."[74] Since morality informs our deliberations about how we might make better decisions in light of competing values, the most ethical course of action is to keep the geoengineering option "on the table," to consider it as one of many potential tools for resolving or ameliorating environmental justice issues.

However, from an environmental justice perspective, geoengineering merely reinforces the existing unfairness of the distribution between rich and poor nations, and the disproportionate burden of environmental harms that the poor face at the hands of the rich. It accomplishes this by almost entirely relying on an ethic of control. Still, by switching from a narrative of victimization to a narrative of empowerment, from a discourse of rights to one of hope, it is possible to envision an alternative to geoengineering. This move involves seeking assistance from Leopold's Earth ethic and an ethic of restraint. While new tools, such as geoengineering, should be part of the environmentalist's tool-kit, and therefore merit sustained research into their feasibility and risks, restraint should still be exercised in experimenting with these tools on a global scale.[75] To do otherwise is not only hubristic, it is also excessively risky—indeed, it puts at risk the future existence of our own species. An alternative to geoengineering is a so-called "contraction and convergence" scenario, in which developed countries cut their emissions, and developing countries' slowly converge upon the reduced emissions of their more industrialized global partners, is a promising alternative.[76] Contraction and convergence invokes an ethic of restraint, specifically, a collaborative effort by rich and poor nations to constrain their economic development for the sake of reducing greenhouse gas emissions, easing environmental burdens on the Global South and ensuring the continued survival of the human species.

6.Conclusion

I would like to conclude by sharing a brief anecdote about my own experience with environmental justice in the community in which I live and work: Hazleton, Pennsylvania. I take a round trip on the city bus to campus three to five days a week, not because I don't have a car, nor because I lack the funds to maintain one or to pay for a taxi, but because I think that it is my responsibility as a geo-citizen committed to reducing my carbon footprint. I notice that the majority of people who take the bus, which goes directly to the Penn State satellite campus, are racial minorities, mostly African-Americans and Hispanics. Having spoken with several of my students who I see on the bus regularly, all of whom are minorities, the near-universal reason for riding the bus is that they cannot afford a car or the associated expenses. In other words, their economic situation dictates behavior that lowers their carbon footprint relative to better-off students, administrators and faculty. I have taken to calling these students "inadvertent environmentalists," since their intention is not to preserve the environment, and yet their economically-constrained behavior

74 Hickman (2007), 174.

75 Ralston (2009). This point is nicely illustrated by a passage from Leopold's *A Sand County Almanac*: "But there is one vocation—philosophy—which knows that all men, by what they think about and wish for, in effect wield tools. It knows that men thus determine, by their manner of thinking and wishing, whether it is worthwhile to weld any." Leopold (1966), 72.

76 Althanasiou and Baer (2002). Bales and Duke (2008), 86. Vanderheiden (2008a), 57.

has that same effect as if that were their intention. On a consequentialist analysis, then, these inadvertent environmentalists' behavior is as equally praiseworthy as that of the conscientious environmentalist. These inadvertent environmentalists are shocked that I would opt to use public transport when I can afford a car and the expense of operating it. However, almost all of them I have talked with are determined to buy an automobile once their income increases. They do not understand why someone would show so much restraint and undergo so much inconvenience, especially when the alternative, driving a car to school daily, would give them greater control over their environment and greater freedom of movement. To make the full conversion to an intentional or conscientious environmentalist, not just an inadvertent one, it would be necessary to raise their consciousness about environmental issues—which I am, of course, determined to do.

As we have seen, the limits of environmental justice—particularly the limitations of its twin discourses (rights and victimization)—are revealed through a Leopoldian-Deweyan treatment. One possible upshot of the previous analysis is that in order for environmental justice to become what Robert Figueroa calls "a transformative form of justice," its proponents must speak about EJ issues differently, that is, exclusively in the language (or discourses) of hope and empowerment.[77] However, this is to restate my argument in stronger terms than I would prefer.[78] Rather, we should seek an alternative framing of environmental justice, one that would not displace the present framing, but that would complement it, understanding EJ issues as series of problematic situations, wherein moral agents seek to strike a healthy balance between an ethic of control and an ethic of restraint.

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77 Figueroa (2002), 30.

78 Indeed, Figueroa's critique of environmental justice is much less conciliatory than my own. He claims that "the relationship between social justice and environmental quality goes deeper than how we should determine the fair distribution of environmental burdens and environmental benefits. [. . .] . . . namely: How can environmental justice teach us about the nature of justice itself." Figueroa (2003), 42. I am more concerned to improve the tools for solving EJ problems than to explore "the nature of justice itself."

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