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Vulnerability and Power in the Age of the Anthropocene

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Abstract

Feminist legal theorist Martha Fineman has suggested that recognition of universal human "vulnerability" should be the starting point for thinking about the state's obligations to its citizens. This Article argues that Fineman's concept of vulnerability is valuable for situating political and legal theory within a concern for the natural world. We live in what some scientists have dubbed the Anthropocene—an age in which our collective behavior has serious implications for the flourishing of all life on earth. The concept of "ecological vulnerability" recognizes that humans are vulnerable not only because they age, become ill, and die, but because their survival depends on complex macro- and micro-ecologies—all of which are, in turn,

vulnerable to harm. Ecological vulnerability can serve as an important conceptual bridge between critical legal theory and the emerging "green" legal theory, helping to close the gap between projects of social justice on one hand and environmental sustainability on the other. Misused, however, vulnerability analysis can make power relations, and therefore injustice, invisible. Legal and political theorists in search of conceptual frameworks appropriate to the Anthropocene must therefore be careful to incorporate a robust anti-subordination principle into their analyses as they adopt the language of ecological vulnerability.

> Admit that humans have crawled or secreted themselves into every corner of the environment; admit that the environment is actually inside human bodies and minds, and then proceed politically, technologically, scientifically, in everyday life, with careful forbearance, as you might with unruly relatives to whom you are inextricably bound and with whom you will engage over a lifetime . . . .[1]

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1.   Jane Bennett, Vibrant Matter: A Political Ecology of Things 116 (2010).

I. Introduction

In a paper published in 2011, a group of scientists led by Will Steffen presented evidence of what they called "The Great Acceleration:" a sudden intensification of the impact of human activity on the global environment.[2] Taking the measure of diverse human phenomena, from human population and fertilizer consumption to the number of McDonald's restaurants worldwide, the authors generated a series of charts. Each chart featured a curve sloping steeply upward, beginning around 1945.[3]

Extreme environmental change on planet Earth is nothing new.[4] As J.R. McNeill points out in his environmental history of the twentieth-century world, "[a]steroids and volcanoes, among other astronomical and geological forces, have probably produced more radical environmental changes than we have yet witnessed in our time."[5] Nor is human impact on the biosphere unprecedented.[6] As beings embedded in biological systems, humans have always affected the fortunes of plant and animal species around us (and within us, as we will see), and these impacts increased as humans began farming, building cities, and domesticating other animals.[7] However, since the dawn of the Industrial Age the scale of human intervention in human and trans-human planetary systems has grown dramatically. McNeill explains that the transition from reliance on human and animal

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2. *See* Will Steffen et al., *The Anthropocene: Conceptual and Historical Perspectives*, 369 PHILOSOPHICAL TRANSACTIONS. ROYAL. SOC'Y. A 842, 851–52 (2011) (charting different measures of human activity from 1750–2000).

3. *See id.* (graphing a several categories of human behavior indicating 1945 as a time where patterns changed).

4. *See* J.R. MCNEILL, SOMETHING NEW UNDER THE SUN: AN ENVIRONMENTAL HISTORY OF THE TWENTIETH-CENTURY WORLD 3 (2000) (noting that "[e]nvironmental change on earth is as old as the planet itself").

5. *Id.*

6. *See id.* at 6 (explaining that, since humanity invented fire, it has been polluting the air).

7. *See* Steffen et al., *supra* note 2, at 846–47 (highlighting agriculture as one of two pre-industrial events that presaged the Anthropocene Era); *see also* MCNEILL, *supra* note 4, at 4 (noting that as a species, "we have cut timber, mined ores, generated wastes, grown crops, and hunted animals for a long time.").

power to reliance on fossil fuels made possible an extraordinary growth in energy use:

> We have probably deployed more energy since 1900, than in all of human history before 1900. My very rough calculation suggests that the world in the twentieth century used 10 times as much energy as in the thousand years before 1900 A.D. In the 100 centuries between the dawn of agriculture and 1900, people used only about two-thirds as much energy as in the twentieth century.[8]

Although this surge in energy use created the conditions for dramatic population growth, longer, healthier lives for humans all over the globe, liberation from "the drudgery of endless muscular toil,"[9] and the flowering of complex human cultural products (including but not limited to cute cat videos), the surge also came at least two costs. The first has been environmental: an intensification of water, soil, and air pollution, the loss of arable land and biodiversity, and disruptions in large-scale and long-term cycles of biology, chemistry and geology as carbon and nitrogen circulate between land, sea and atmosphere.[10] The most dramatic example of these disruptions, of course, is global warming.[11] Steffen and his co-authors argued that these disruptions are so large that they should be acknowledged in our measurements of geological time.[12] In their view, we should declare an end to the Holocene Era, which began about 10,000 years ago, and recognize the beginning of the "Anthropocene Era."[13]

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8.   MCNEILL, *supra* note 4, at 15.

9.   *Id.*

10.   *See id.* at 15–16 (stating that one of the costs of energy intensification is the increase of pollution generated by fossil fuel combustion).

11.   *See* Steffen et al., *supra* note 2, at 842–43 (addressing the role of climate change in the emergence of the Anthropocene).

12.   *See id.* at 860–62 (discussing the societal implications of accepting the concept of the Anthropocene).

13.   *See id.* at 847 (arguing that the Industrial Revolution set human beings on a path away from the Holocene Era).

The second cost of humanity's turn to fossil fuel energy has been an increase in economic and political inequality.[14] McNeill observes that "fossil fuel use has sharply increased the inequalities in wealth and power among different parts of the world."[15] These inequalities are typically discussed in terms of a divide between the "developed" and "developing" nations, or the "global North" versus the "global South," where the wealthy countries of the "developed" North are contrasted with the poor countries of the "developing" South.[16] This divide is clearly visible in terms of energy use. For example, McNeill notes that "The average American in the 1990s used 50 to 100 times as much energy as the average Bangladeshi and directed upwards of 75 energy slaves [human equivalents] while the Bangladeshi had less than one."[17] The differential is similarly reflected in comparative calculations of "carbon footprints," a popular measure of greenhouse gas production. As Katrina Fischer Kuh notes, "The United States citizen's Sasquatch-sized carbon footprint of approximately twenty metric tons of carbon dioxide dwarfs the Thumbelina-like footprint, a mere one metric ton, of the average Indian citizen."[18] Compounding these production inequalities, international trade relations frequently result in the

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14.   *See* MCNEILL, *supra* note 4, at 15–16 ("Harnessing fossil fuels played a central (though not exclusive) role in widening the international wealth and power differential so conspicuous in modern history.").

15.   *Id.*

16.   This conventional dichotomy has become increasingly misleading as several nations formerly classified as "developing" have rapidly industrialized. *See* Ruth Gordon, *The Dawn of a New, New International Economic Order?* 72 LAW & CONTEMP. PROBS. 131, 134–38 (2009) (criticizing the terms "developed" and "developing" and substituting a tripartite categorization of high-, middle-, and low-income nations). Most notably, China, long considered a "developing" nation, has become not only a political and economic superpower, but also the world's largest greenhouse gas emitter. *See* Michael P. Vandenbergh, *The China Problem*, 81 S. CAL. L. REV. 905, 908 (2008) (discussing the scale of China's greenhouse gas emissions); Ruth Gordon, *The Environmental Implications of China's Engagement with Sub-Saharan Africa*, 42 ENVTL. L. REP. NEWS & ANALYSIS 11109, 11111 (2012) (discussing China's political and economic strength).

17.   MCNEILL, *supra* note 4, at 16.

18.   Katrina Fischer Kuh, *Energy and the Environment: Empowering Consumers*, 37 HOFSTRA L. REV. 911, 916 (2009).

transfer of hazardous waste from the global North to the global South.[19]

The divide between the global North and the global South did not arise by accident. Rather, behind these differentials of wealth, energy use, and pollution burden stand the long-term, large-scale political projects we now refer to as "colonialism," "imperialism," and "chattel slavery."[20] The technologies associated with the Industrial Revolution and reliance on fossil fuel energy over human and animal somatic energy gave colonizing nations an edge over colonized nations, intensifying the socioeconomic inequalities between them.[21] Far from being over and done with, the economic, environmental, and social effects of these global relations of domination continue today.

What are the implications of the revolution in human energy use and its twin costs—environmental degradation and socioeconomic inequality—for legal theory? A large and sophisticated legal literature now addresses the regulatory implications of global climate change and other environmental aspects of the Anthropocene era at the local, national, and international scale, from the perspective of environmental law and policy.[22] There is also a smaller but robust and growing body

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19. Gonzalez explains:

Hazardous waste generators in the North export wastes to the South because strict environmental regulation and citizen opposition to the location of waste disposal facilities have increased the cost of waste disposal in the North. By contrast, hazardous waste disposal is significantly cheaper in the South due to weak environmental regulation, lax enforcement, and government corruption. Moreover, poverty and debt create powerful incentives for developing countries to accept hazardous waste shipments from other nations in order to earn badly needed foreign exchange. Carmen G. Gonzalez, *Beyond Eco-Imperialism: An Environmental Justice Critique of Free Trade*, 78 DENV. U. L. REV. 979, 989 (2001).

20. *See, e.g.*, Carmen G. Gonzalez, *Markets, Monocultures, and Malnutrition: Agricultural Trade Policy Through an Environmental Justice Lens*, 14 MICH. ST. J. INT'L L. 345, 357–58 (2011) (explaining how colonialism led to "undernourishment and environmental degradation" in colonized states).

21. *See, e.g.*, Gonzalez, *Beyond Eco-Imperialism*, *supra* note 19, at 988–92 (describing how disposal of hazardous waste from colonizing nations (North) to colonized nations (South) creates inequality in the South).

22. *See generally*, Benjamin Ewing & Douglas A. Kysar, *Prods and Pleas: Limited Government in an Era of Unlimited Harm*, 121 YALE L.J. 350 (2011) (examining the use of federal and state tort law to guide governments in addressing climate change); Jonathan S. Masur & Eric A. Posner, *Climate*

of work addressing the social implications of climate change, including scholarship that brings together environmental law and human rights law to consider the obligations of states to individuals and groups whose lives have or will be disrupted by rising seas and natural disasters.[23] However, little has been written as yet considering the implications of the Anthropocene for critical legal theory. With a few notable exceptions, critical legal theorists have concentrated on "social justice" and

Regulation and the Limits of Cost-Benefit Analysis, 99 CALIF. L. REV. 1557 (2011) (reviewing regulations on industry and the global climate, and providing recommendations for the use of cost-benefit analysis in the regulatory sphere); J.R. DeShazo & Jody Freeman, *Timing and Form of Federal Regulation: The Case of Climate Change*, 155 U. PA. L. REV. 1499, (2007) (highlighting state regulatory action as a tool to develop federal regulations on climate change); Kirsten Engel, *State and Local Climate Change Initiatives: What Is Motivating State and Local Governments To Address a Global Problem and What Does This Say About Federalism and Environmental Law?*, 38 URB. LAW. 1015 (2006) (discussing state and local governments' roles in climate change regulation); Kirsten H. Engel & Scott R. Saleska, *Subglobal Regulation of the Global Commons: The Case of Climate Change*, 32 ECOLOGY L.Q. 183 (2005) (advocating for a collective, rather than unilateral, approach to climate change).

     23.   *See generally*, Evadne Grant, Louis Jacobus Kotze & Karen L. Morrow, *Human Rights and the Environment: In Search of a New Relationship*, 3 OÑATI SOCIO-LEGAL SERIES 953 (2013) (Spain), *available at* http://ssrn.com/abstract=2221302 (summarizing the discussions and themes which emerged from the Oñati Workshop on Human Rights and the Environment, including "vulnerability; the limits of the law; the limits of rights; responsibility; interconnection; and thinking ecologically") (on file with the WASHINGTON AND LEE JOURNAL ON ENERGY, CLIMATE, AND THE ENVIRONMENT); Sofya Manukyan, Can the ICESCR Be an Alternative for Environmental Protection? Analysis of the Effectiveness of the ICESCR in Holding State and Non-State Actors Accountable for Environmental Degradation (September 10, 2013) (unpublished M.A. dissertation, University of Essex), *available at* http://ssrn.com/abstract=2364130 (exploring the use of the ICESCR as a tool to establish environmental protection throughout the globe) (on file with the WASHINGTON AND LEE JOURNAL ON ENERGY, CLIMATE, AND THE ENVIRONMENT); Timo Koivurova and Sébastien Duyck & Leena Heinämäki, *Climate Change and Human Rights*, *in* CLIMATE CHANGE AND THE LAW 287 (21 IUS GENTIUM: COMPARATIVE PERSPECTIVES ON LAW AND JUSTICE), *available at* http://ssrn.com/abstract=2336876
(Erkki J. Hollo et al. eds, 2013) (describing the relationship between human rights and climate change) (on file with the WASHINGTON AND LEE JOURNAL ON ENERGY, CLIMATE, AND THE ENVIRONMENT); Hari M. Osofsky, *Learning from Environmental Justice: A New Model for International Environmental Rights*, 24 STAN. ENVTL. L.J. 71 (2005) (analyzing environmental justice litigation from international, regional, and United States tribunals to develop an approach to addressing environmental justice issues on an international scale).

environmental scholars have concentrated on "sustainability," with few overlaps in these distinct conversations.[24]

This Article seeks to help bridge the gap. I argue that feminist theorist Martha Fineman's recent work on "vulnerability" provides a useful means of integrating critical legal theory and environmental scholarship. In a series of articles, Fineman argues that law needs a theory of vulnerability to supplement anti-subordination theory's focus on equality

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24. A few environmentally oriented legal scholars have produced work that could be understood as "critical environmental theory." *See, e.g.,* Michael M'Gonigle & Louise Takeda, *The Liberal Limits of Environmental Law: A Green Legal Critique*, 30 PACE ENVTL. L. REV. 1005, 1080 (2013) (calling for a "green legal theory"). M'Gonigle and Takeda, however, are silent on the connections between social subordination and environmental production and destruction. Similarly, Douglas Kysar and Mary Christina Wood have begun the task of imagining environmental regulation that would represent a meaningful check on growth-oriented capitalism, rather than an accommodation to it. *See, e.g.*, Douglas A. Kysar, *Law, Environment, and Vision*, 97 NW. U. L. REV. 675, 677 (2003) (advocating for the use of economics in the regulatory sphere); Mary Christina Wood, *"You Can't Negotiate with a Beetle": Environmental Law for a New Ecological Age*, 50 NAT. RESOURCES J. 167, 191 (2010) ("Agencies must significantly amplify the protection of vital resources, which means that they must strengthen their resistance to proposals for private profit that cause ecological damage."). For work situated within philosophy and ethics that begins to consider the broad implications of the Anthropocene, see, e.g., Anna M. Grear, *Towards a New Horizon: in Search of a Renewing Socio-Juridical Imaginary*, 3 OÑATI SOCIO-LEGAL SERIES 966 (2013) (Spain), *available at* opo.iisj.net/index.php/osls/article/viewFile/263/310 (on file with the WASHINGTON AND LEE JOURNAL ON ENERGY, CLIMATE, AND THE ENVIRONMENT). This work, however, similarly fails to address the subordination dimension of the economic-environmental crisis.

A few critical legal scholars have begun to consider the implications of global climate change for the project of equality. *See, e.g.*, Ruth Gordon, *supra* note 16. In general, however, scholars writing from an environmental justice perspective have been the most active in developing the groundwork for a critical legal theory of the Anthropocene that takes seriously both justice and sustainability. For example, Carmen Gonzalez's scholarship on food, environment, human rights, and international trade relations connects the present reality of environmental crisis, the ideologies and institutions of international "development," and the legacies of colonialism and imperialism. *See, e.g.*, Carmen G. Gonzalez, *The Global Food System, Environmental Protection, and Human Rights,* 26 NAT. RESOURCES & ENV'T 7 (2012)*;* Carmen G. Gonzalez, *An Environmental Justice Critique of Comparative Advantage: Indigenous Peoples, Trade Policy, and the Mexican Neoliberal Economic Reforms*, 32 U. PA. J. INT'L L. 723 (2011); Gonzalez, *Markets, Monoculture, and Malnutrition, supra* note 20; Gonzalez, *Beyond Eco-Imperialism*, *supra* note 19.

among persons.[25] For Fineman, the concept of vulnerability reflects the fact that we are "born, live, and die within a fragile materiality that renders all of us constantly susceptible to destructive external forces and internal disintegration."[26] Fineman further argues that recognizing human vulnerability requires that we relinquish, or at least significantly alter, our existing theories of the self and of the state.[27] Building on feminist and postmodern critiques of the autonomous liberal subject, Fineman uses the concept of vulnerability to imagine a political subject that is not only embedded in human relationships, but is also materially and temporally fragile.[28] She concludes that justice for beings who are made of flesh, who sicken, age, and die, and who depend on each other for survival requires positive obligations from the state to take care of its

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25.   *See* Martha Albertson Fineman, *"Elderly" as Vulnerable: Rethinking the Nature of Individual and Societal Responsibility*, 20 ELDER L.J. 71, 71 (2012) [hereinafter *Elderly as Vulnerable*] ("The vulnerability of our embodied beings and the messy dependency that often comes in the wake of physical or physiological needs cannot be ignored throughout any individual life and must be central to theories about what constitutes a just and responsive state."); Martha Albertson Fineman, *Beyond Identities: The Limits of an Antidiscrimination Approach to Equality*, 92 B.U. L. REV. 1713, 1719 (2012) [hereinafter *Beyond Identities*] ("[T]he foundational difference between the manner in which equality is understood in the United States and how it is understood in much of the rest of the world arises from the recognition and acceptance in other countries that human need and vulnerability are not only an individual responsibility but also a state responsibility."); Martha Albertson Fineman, *The Vulnerable Subject and the Responsive State*, 60 EMORY L.J. 251, 256 (2010) [hereinafter *Responsive State*] ("In this Essay I explore how the concept of vulnerability can help us better understand how to actually realize that often-glorified American commitment to equality of opportunity and access."); Martha Albertson Fineman, *The Vulnerable Subject: Anchoring Equality in the Human Condition*, 20 YALE J.L. & FEMINISM 1, 1 (2008) [hereinafter *Vulnerable Subject*] ("The vulnerability approach I propose is an alternative to traditional equal protection analysis . . . .").

26.   *See* Fineman, *Vulnerable Subject*, *supra* note 25, at 12 (explaining the tensions explored by vulnerability).

27.   *See* Fineman, *Beyond Identities*, *supra* note 25, at 1752 ("My argument is that to attain broad general opportunity and access in today's world, the state must be responsive to individual, social, and institutional circumstances so that equality is anchored in the realities of the human condition and not some abstract and unachievable 'ideal.'").

28.   *See id.* at 1752–53 (explaining that the concept of the 'vulnerable subject' was developed by asking questions regarding how individuals handle the concept of the material fragility of existence).

citizens, not just the negative obligation to refrain from intrusion on their liberty.[29]

      This Article argues that vulnerability theory provides a way to situate theories of political obligation within care for the natural world. Vulnerability has always been the reality of human life on earth, but today, as Steffens' charts vividly illustrate,[30] we are living in "a regime of perpetual ecological disturbance"[31] that threatens not only human life, but also all life on the planet. The advent of the Anthropocene era requires heightened awareness of the relationship between humans and the environments in which they live, including a series of positive obligations of the state vis-à-vis both humans and what we think of as "the environment" or "nature."[32] Conceptualizing "ecological vulnerability" can help make this relationship visible. However, as Fineman acknowledges and I want to underscore, vulnerability cannot and should not stand alone as the starting place for legal and political theory.[33] The language of

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      29.   *See id.* at 1760 (arguing that the responsive state will be generative rather than destructive if it can recognize the complex relationship between individuals and institutions, and highlighting the role the state must play in the maintenance of that relationship).

      30.   *See generally* Steffen et al., *supra* note 2 (providing several graphs depicting the onset of the Anthropocene).

      31.   MCNEILL, *supra* note 4, at xxiv.

      32.   In this way, my argument parallels the argument of "ecological economists," who situate economic institutions within the natural world. *See* Robert Costanza, Herman E. Daly & Joy A. Bartholomew, *Goals, Agenda, and Policy Recommendations for Ecological Economics*, *in* ECOLOGICAL ECONOMICS: THE SCIENCE AND MANAGEMENT OF SUSTAINABILITY 5 (Robert Costanza ed., 1991) (explaining, in Table 1.1, that Ecological Economics "[a]cknowledges [the] interconnections between humans and the rest of nature"); HERMAN E. DALY, BEYOND GROWTH: THE ECONOMICS OF SUSTAINABLE DEVELOPMENT 45–51 (1996) (explaining the "elements of environmental economics"); Kysar, *Law, Environment, and Vision*, *supra* note 24, at 680–93 (2003) (reviewing the emergence, tenets, and methodology of ecological economics); Douglas A. Kysar, *Sustainable Development and Private Global Governance*, 83 TEX. L. REV. 2109, 2115 n. 37 (2005) (describing ecological economics as "a field that is distinguishable from neoclassical economics based on its insistence that questions of equity and scale should be seen as analytically prior to questions of efficiency").

      33.   *See* Fineman, *Responsive State*, *supra* note 25, at 275 ("Vulnerability analysis is an attempt to articulate a more self-conscious and aware egalitarian political culture; one that more robustly adheres to the all-American promise of equality of opportunity and equal access to the American dream. It is those aspirations for substantive equality for the vulnerable subject

vulnerability can be used to direct attention away from the social and political roots of injury. This Article argues for a view of ecological vulnerability that takes a commitment to the indivisibility of humans and their environments and a commitment to anti-subordination as valuable checks on one another—supplements, rather than substitutes.

The Article proceeds as follows. Part II.A begins with a brief review of Fineman's theory of vulnerability.[34] In subsection B, relying on recent efforts of economists and natural scientists to understand and account for the macro- and micro-ecologies in which human life is embedded, I argue that Fineman's descriptive account of vulnerability can be extended by considering the human body as dependent on—indeed, perhaps unimaginable apart from—a series of flows and interactions with the non-human world.[35] The concept of "ecological vulnerability" helps us imagine the bearer of legal rights as a fully embodied subject whose body is inseparable from "the environment." In Part III, I consider some of the implications of ecological vulnerability for legal and political governance. Subsection A reviews some accounts of the ecologically vulnerable subject developed by theorists of "materiality" in the humanities.[36] In subsection B, I derive from their work two first principles for responding to ecological vulnerability in law.[37] First, the state has a fundamental obligation of environmental protection that is indivisible from its obligation to protect human rights (the "indivisibility principle"). Second, a critical analysis of power is necessary to supplement vulnerability analysis (the "anti-subordination principle"). Finally, subsection C takes note of some existing models for ecological vulnerability in policy, politics, and law, including the policy frame of "just sustainabilities," the political theory and advocacy of the environmental justice movement, and recent legal developments in Latin America.[38] It concludes that a vulnerability analysis

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that should form the ultimate ideals against which the state and its societal institutions and their actions are judged.").

34.   *See infra* Part II.A.
35.   *See infra* Part II.B.
36.   See *infra* Part III.A.
37.   See *infra* Part III.B.
38.   See *infra* Part III.C.

requires us to recognize ecological vulnerability as part and parcel of humans' "fragile materiality."

II. Toward a Theory of Ecological Vulnerability

A. Fineman and Vulnerability

Martha Fineman's theory of vulnerability begins with the observation that United States constitutional equality norms are narrow compared to those of nations with more recently drafted constitutions.[39] American constitutional equality, driven by the United States Supreme Court's interpretation of the Fourteenth Amendment's Equal Protection Clause,[40] is "understood narrowly as only the requirement of sameness of treatment between different social classifications."[41] Even the guarantee of identical treatment applies unevenly: some group classifications receive strict judicial scrutiny, such as race; others, like gender, receive intermediate scrutiny; and still others, such as poverty, are not recognized at all as sources of constitutional violation.[42] Moreover, Fineman continues, the guarantee of identical treatment focuses on individuals, not groups, and has little to say about group-wide disadvantage or access to opportunity structures.[43] Rights to the remediation of historic group harms,

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39. *See* Fineman, *Responsive State*, *supra* note 25, at 253–54 (explaining that the United States, when compared to European countries, has ratified far fewer provisions that would improve current understanding of the government's role in equality).

40. *See* U.S. CONST. amend. XIV, §1 ("No State shall make or enforce any law which shall abridge the privileges and immunities of citizens of the United States; nor shall any State deprive any person of life, liberty, or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws.").

41. Fineman, *Beyond Identities*, *supra* note 25, at 1727.

42. *See id.* at 1727–28 (explaining which classifications are subject to strict scrutiny, intermediate scrutiny, and rational basis review); *see generally* Julie A. Nice, *Whither the Canaries: On the Exclusion of Poor People from Equal Constitutional Protection*, 60 DRAKE L. REV. 1023 (2012) (criticizing the Supreme Court's failure to recognize poverty as a classification meriting heightened scrutiny).

43. *See* Fineman*, Beyond Identities, supra* note 25, at 1728 ("[T]he guarantee of equal protection law is understood, even for the most protected individuals, as a prohibition against arbitrary discrimination and not as some broader inquiry into subordination or relative disadvantage.").

like slavery, sit uncomfortably with the norm of identical treatment of individuals without regard to group identity; for example, "affirmative action" in the United States is a vexed concept subject to political and legal attack because it violates this norm.[44]

The U.S. jurisprudence of equality is also framed by "first generation" negative human rights—rights to be let alone by the state—rather than second- or third-generation "positive" economic and social rights, such as rights to education, housing, or an adequate standard of living.[45] As Fineman writes,

> The paramount tenet of individual liberty is that the individual must have the autonomy to make choices independent of state interference. This principle informs our economic, legal, and political theories and is indispensable to the rhetoric of personal responsibility that pervades current discussions about entitlement reform. What Americans have instead of social and socioeconomic rights is liberty or autonomy—the right to make choices, the right to contract.[46]

In American political and social life, "vulnerability" is a stigmatized condition, characterizing certain groups—such as children, the elderly, and the ill—that are understood as lacking the capacity to fully exercise political and social autonomy.[47] In this conception, vulnerable populations are perceived as the

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44.   *See id.* at 1742–43 ("[R]ecent concerns regarding reverse discrimination and "innocent" third parties, as well as the controversy over the use of strict scrutiny in such cases, has raised doubts about the future of affirmative action in American jurisprudence.").

45.   *See id.* at 1722–23 ("[T]here is a significant divergence between the U.S. Constitution and roughly eighty percent of the rest of the world which has articulated the right to have basic physical needs met through the provision of "second-generation [human] rights" such as state guarantees of medical care and food.").

46.   *Id.* at 1747–48 (citations omitted).

47.   *See id.* at 1748 ("Those who cannot effectively exercise their right to contract because they are not sufficiently capable, independent, and autonomous actors are herded together in designated "vulnerable populations," a designation that functionally operates as a proxy for need and dependency and renders those within it susceptible to monitoring and supervision.").

opposite of the "normal" political subject. Fineman puts the point this way:

> The very idea of vulnerable populations situates and validates an opposite and binary ideal—a population of autonomous, self-sufficient, and independent liberal subjects. These liberal subjects are conceived of as invulnerable, or, at the very least, as expressing only a different, more acceptable vulnerability while still successfully achieving independence, self-sufficiency, and autonomy. They are the taxpayers, the job creators, the heads of households, and the pillars of the community.[48]

But because all human beings are born, live, and die in fragile bodies, "vulnerability" is the rule, not the exception.[49] The

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48.   *Id.* at 1751 (citations omitted). Vulnerability used in this conventional way overlaps with "dependency," a stigmatized characteristic attributed to similar groups—single mothers, children, the poor. *See id.* at 1748. As Nancy Fraser and Linda Gordon observed decades ago, in American policymaking and politics to be dependent (on the welfare state, for instance) is considered morally suspect; the normal citizen is expected to need nothing from the state beyond the bare minimum of protections against force and fraud. *See* Nancy Fraser & Linda Gordon, *A Genealogy of Dependency: Tracing a Keyword of the U.S. Welfare State*, 19 SIGNS 309, 309 (1994), *available at* www.jstor.org/stable/3174801 (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT). As Fineman and Fraser and Gordon observe, of course, identifying only certain groups as vulnerable obscures the fact that no one is invulnerable. Fineman, *Beyond Identities*, *supra* note 25, at 1750 ("This targeted-group approach to vulnerability ignores its universality and inappropriately constructs relationships of difference and distance between individuals and groups within society."). Vulnerability in the sense of dependency is also a highly negatively charged term in our society. See Fraser & Gordon, *Genealogy of Dependency*, at 311 ("The term carries strong emotive and visual associations and a powerful pejorative charge.").

49.   As Fineman poignantly writes:
The idea of the "vulnerable subject" as the appropriate legal and political subject arose from asking two fundamental questions: (1) What should be the political and legal implications of the fact that we are embodied beings, which means we are born, live, and die within a fragile materiality that renders all of us constantly susceptible to both internal and external forces beyond our control? (2) What accounts for the lack of consideration given by our political, economic, and legal systems to the messy but inescapable dependency of human nature,

typical human moves through a "life-course," experiencing various forms of dependency and interdependency from birth to death.[50] The typical human is also subject to internal and external circumstances over which she has little or no control—both negative, such as disease, crime, and disaster, and positive, such as being born into a wealthy family or into a privileged racial, ethnic, or gender identity.[51] These sources of vulnerability are institutional and structural in nature, and Fineman argues that a state committed to equality should respond to them.[52]

According to Fineman, then, it is the state's responsibility not only to respond to individual acts of discrimination against people on the basis of irrelevant personal characteristics over which they have no control, but also to respond to unequal opportunities produced by social structures and institutions.[53] For Fineman, the just state is one that valorizes "political responsibility" as well as personal responsibility.[54] Political responsibility "ensure[s] access to and opportunities within the institutions that have been entrusted with generating and allocating wealth, power, and position in a market society."[55]   In

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marked as it is by "bodily needs, desires, and yearnings?" Fineman, *Beyond Identities,* at 1752–53.

50.   *See* Fineman, *id.* at 1753 ("[T]he concept of the vulnerable subject is built around the idea of 'life-course,' reflecting a range of developmental and social stages through which individuals are likely to pass in the course of a normal lifespan.").

51.   *See id.* ("[T]he individual will encounter a myriad of opportunities, frustrations, challenges, and experiences during his or her life, necessitating a wide range of expertise and capabilities.").

52.   Fineman writes:

We are all differently situated within webs of economic and institutional relationships that structure our options and create opportunities. This form of difference focuses us on institutional arrangements and makes it hard to ignore the realization that in order to have a more robust equality-based society it will be necessary to move beyond individual identities and discrimination as it is now understood and adopt a more structural and institutional perspective. *Id.* at 1755.

53.   *See id.* at 1760 (advocating for a responsive state which views individuals and institutions as "intertwined").

54.   *See id.* at 1762 ("[T]he responsive state begins and ends with the concept of political responsibility.").

55.   *Id.* Property theorist Gregory Alexander articulates a similar set of propositions:

place of the state of limited powers that historically shaped American law and politics, Fineman proposes a "responsive state:"

> The responsive state views individuals and institutions as intertwined, symbiotic, and interdependent with each other and also with the state and its apparatus. Institutions are shaped through law and their operation profoundly affects individual options, opportunities, and well-being and the ability of the state to effectively govern. State responsiveness recognizes that the intertwining of the individual with the institutional can be either generative or destructive, warranting supervision and correction by the only entity capable of doing so: the modern state. This state, in turn, should be understood as a cluster of relationships, institutions, and agencies reflecting and shaping public norms and values through law and policy. Those relationships include the relationship between citizen and state, as well as between state and institutions. In a responsive state individuals realize that they too comprise the state and instead of standing outside of it they have a responsibility to see it is working effectively. Perhaps we could call this relationship "democracy."[56]

Social structures, including distributions of [legal] rights and the definition of the rights that go along with the ownership of property, should be judged, at least in part, by the degree to which they foster the participation by human beings in these objectively valuable patterns of existence and interaction. . . .

As a matter of human dignity, every person is equally entitled to flourish. This being so, every person must be equally entitled to those things essential for human flourishing, i.e., the capabilities that are the foundation of flourishing and the material resources required to nurture those capabilities. Gregory S. Alexander, *The Social-Obligation Norm in American Property Law*, 94 CORNELL L. REV. 745, 764, 768 (2009).

56.   Fineman, *Beyond Identities*, *supra* note 25, at 1760.

B. The "Environmentally Embedded" Subject

In calling attention to infancy, old age, sickness, and death, Fineman reminds readers that the legal subject is lodged in and indissoluble from a human body.[57] Yet, the vulnerability of the human person is not only a product of the body's temporal finitude, but also of the body's status as a living system. Even the body of a healthy, non-disabled, adult human is dependent upon complex interactions inside and outside the body that her mind is seldom aware of, let alone able to control.[58] Vulnerability is thus produced not only by human interdependency, but also the interdependency of the human body with a complex array of nonhuman and trans-human systems. A healthy adult human can only be considered separate from her environment by willfully forgetting this interdependency.

Based on these observations, postmodern and feminist theorists of materiality, such as political theorist Jane Bennett, argue that the conventional split between "humans" and "the environment" is profoundly misleading.[59] "The environment" is inside each person, and human activity shapes "the environment."[60] The body, in sickness and in health, can be seen as a set of relationships and interactions that constantly cross the border between self and other.[61] From this perspective, political responsibility extends not only to the social and economic institutions that mediate our fundamental vulnerability, but also the web of human and trans-human relationships and institutions that enable and mediate human life on earth.[62]

The remainder of this Part introduces ideas developed by ecological economists and biologists that support this expansion

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57.   *See* Fineman, *Elderly as Vulnerable, supra* note 25, at 86 (explaining the inevitable physical dependence all humans face as they go through childhood, illness, disability, and old age).

58.   See *infra* Part II.B.2.

59.   *See* JANE BENNETT, VIBRANT MATTER 111–13 (2010) (discussing "vital materiality" theory which argues that humans are on a horizontal ontological plane with non-humans and the environment).

60.   *See id.* at 111 (differentiating environmentalism from materiality theory in that "environmentalists are sevles who live on earth, [and] vital materialists are selves who live as earth").

61.   *See infra* Part II.B.2.

62.   See *infra* Part II.B.1.

of Fineman's theory—a concept I am calling "ecological vulnerability." Building on these ideas, this Article suggests that Fineman's conception of the embodied, and therefore vulnerable, subject should include not only awareness of the human life course, but the recognition that in each moment of that life course humans exist only in, and because of, complex relations of "interbeing"[63] with nonhuman and nonliving systems.

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63. The term "interbeing" has been popularized by Thich Nhat Hanh, a Vietnamese Buddhist monk, teacher, author, poet, and peace activist. *Thich Nhat Hanh*, PLUM VILLAGE, http://plumvillage.org/about/thich-nhat-hanh/ (last visited Dec. 29, 2014) (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT). In 1966 Hanh founded the "Order of Interbeing" (Tiep Hien in Vietnamese) as "a community of monastics and lay people who have committed to living their lives in accord with the Fourteen Mindfulness Trainings, a distillation of the Bodhisattva (Enlightened Being) teachings of Mahayana Buddhism." *Order of Interbeing*, PLUM VILLAGE, http://plumvillage.org/about/order-of-interbeing/ (last visited Dec. 29, 2014) (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT). Hanh offers this example to explain the term:

> If you are a poet, you will see clearly that there is a cloud floating in this sheet of paper. Without a cloud, there will be no rain; without rain, the trees cannot grow; and without trees, we cannot make paper. The cloud is essential for the paper to exist. . . . So we can say that the cloud and the paper *inter-are.*
>
> If we look into this sheet of paper even more deeply, we can see the sunshine in it. If the sunshine is not there, the forest cannot grow. . . . And if we continue to look, we can see the logger who cut the tree and brought it to the mill to be transformed into paper. And we see the wheat. We know that the logger cannot exist without his daily bread, and therefore that the wheat that became his bread is also in this sheet of paper . . . . The fact is that this sheet of paper is also made up of "non-paper elements." . . . As thin as this sheet of paper is, it contains everything in the universe in it.
> THICH NHAT HANH, ESSENTIAL WRITINGS 55–56 (Robert Ellsberg ed., 2001).

The term "interbeing" is also associated with a fundamental Buddhist concept, translated as "dependent origination" or "dependent co-arising." Religious scholar David L. McMahan explains that as an empirical description, dependent origination "represents the world as a vast, interconnected web of internally related beings—that is, whose identity is not a priori independent of the systems they are a part of but is inseparable from those systems." DAVID L. MCMAHAN, THE MAKING OF BUDDHIST MODERNISM 150 (2008).

1. *"Outside Ecologies:" Macro-Level Vulnerability*

At a macro-level of scale, all human life is engaged with, and depends on, both the ecological "web of life" and oceanic and atmospheric systems that provide living beings with "natural services." Recognition of human dependence on these relationships extends our understanding of what it means to be individually and collectively vulnerable.

Support for this view can be found in recent policy and theoretical efforts to develop assessment systems for quantifying ecosystem processes. For example, in 2000 then-United Nations Secretary General Kofi Annan called for an international project known as the Millennium Ecosystem Assessment (MA), which involved the work of more than 1,360 experts from 95 countries.[64] Carried out between 2001 and 2005, the objective of the MA was "to assess the consequences of ecosystem change for human well-being and the scientific basis for action needed to enhance the conservation and sustainable use of those systems and their contribution to human well-being."[65] Similar to the Intergovernmental Panel on Climate Change,[66] the MA assembled and synthesized already-existing research and data; its purpose was to assist policymaking regarding environmental international conventions.[67]

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64.   *See* MILLENNIUM ECOSYSTEM ASSESSMENT, ECOSYSTEMS AND HUMAN WELL-BEING: SYNTHESIS, at ii, vii (2005), *available at* www.millenniumassessment.org/documents/document.356.aspx.pdf (providing background for the inception of and contributions to the MA).

65.   *See id.* at v (stating the purpose of the assessment and the years it took place); *see also* Gretchen C. Daily, *Introduction: What Are Ecosystem Services?*, *in* NATURE'S SERVICES: SOCIETAL DEPENDENCE ON NATURAL ECOSYSTEMS 3 (Gretchen C. Daily ed., 1997) (defining and explaining the concept of ecosystem services).

66.   *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *History*, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE: ORGANIZATION, https://www.ipcc.ch/organization/organization_history.shtml (last visited July 31, 2014) ("The Intergovernmental Panel on Climate Change was created in 1988. It was set up by the World Meteorological Organization (WMO) and the United Nations Environment Program (UNEP) to prepare, based on available scientific information, assessments on all aspects of climate change and its impacts, with a view of formulating realistic response strategies.") (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT).

67.   *See* MILLENNIUM ECOSYSTEM ASSESSMENT, *supra* note 64, at v ("The MA did not aim to generate new primary knowledge, but instead sought to

In its synthesis report, the MA defined an ecosystem as "a dynamic complex of plant, animal, and microorganism communities and the nonliving environment interacting as a functional unit," and defined "ecosystem services" as "the benefits people obtain from ecosystems."[68] The MA identifies four types of ecosystem services: (1) provisioning services, which include food, water, timber and fiber, (2) regulating services, such as the regulation of climate, floods and waste treatment, (3) cultural services, such as recreation and aesthetic enjoyment, and (4) supporting services such as soil formation, pollination and nutrient cycling.[69]

An important impetus for the MA's project was to intervene in economic policymaking and economic theory.[70] Under conventional neoclassical economics, ecosystem services were undervalued or not valued at all.[71] In the second half of the twentieth century, however, certain sub-disciplines of economic theory, including "environmental economics" and "ecological economics," began attempting to identify and value ecosystem services.[72] Although the two sub-fields differ in their qualitative framework, both environmental economics and ecological economics "overlap in the use of specific techniques to measure

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add value to existing information by collating, evaluating, summarizing, interpreting, and communicating it in a useful form.").

68. *See id.* (defining ecosystem and ecosystem services).

69. *See id.* (distinguishing the four types of ecosystem services).

70. *See id.* (stating that the MA was focused on the exploration of policy questions).

71. *See e.g.* Erik Gomez-Baggethun, Rudolf de Groot, Pedro L. Lomas & Carlos Montes, *The History of Ecosystem Services in Economic Theory and Practice: From Early Notions to Markets and Payment Schemes*, 69 ECOLOGICAL ECON., Nov. 3, 2009, at 4 (explaining a statement made by economist Robert Solow that capital could substitute for land, so that scarcity of land need not be figured into economic calculations: "The world can, in effect, get along without natural resources, so exhaustion is just an event, not a catastrophe").

72. *See* Maureen L. Cropper & Wallace E. Oates, *Environmental Economics: A Survey*, 30 J. OF ECON. LITERATURE 675, 675 (1992) (describing how economists responded to the "environmental revolution" of the 1960's, resulting in the emergence of environmental economics); *see also* Costanza, *supra* note 32, at 3 ("Ecological economics is a new transdisciplinary field of study that addresses the relationships between ecosystems and economic systems in the broadest sense.").

sustainability, evaluate policies and assist decision-making."[73] The goal of both is to make economic analysis more consistent with the physical world it describes, both in the service of accurate science and in the service of better policymaking.[74] Without recognition of the resources provided by the natural world and their limits, the devotion of conventional economic policymaking to endless growth threatens life on the planet.[75]

As an example, the ecosystem services provided by or facilitated by water are perhaps not well understood by most humans, yet are necessary to our continued existence. Marcia Stanton explains:

> Healthy aquatic ecosystems depend on water quality, flow and adequate temperature so as to maintain their capacity to provide services. Once these needs are met, they provide several services such as climate and hydrological regulation; nutrient distribution and primary production; sheltering, breeding, and habitat for many species; waste dilution and detoxification, prevention from soil erosion and siltation, and a buffer against natural hazards.[76]

Although schemes for monetizing ecosystem services have been criticized, and arguments continue about the particular prices or values that should be placed on various services, it is not

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73.   *See* Gomez-Baggethun, *supra* note 71, at 4. These authors, a group of ecological economists, explain the difference as follows:
> Environmental Economics operates mainly within the axiomatic framework of Neoclassical Economics – e.g. theory of consumer choice, perfect information, and marginal productivity theory of distribution. Ecological Economics challenges some of these assumptions and conceptualizes the economic system as an open subsystem of the ecosphere exchanging energy, materials and waste flows with the social and ecological systems with which it co-evolves. *Id.* (citations omitted).

74.   *See id.* at 6 (explaining the impact on science and on policymaking).

75.   *See id.* at 4–5 (challenging models of economic growth in which natural resources are absent).

76.   Marcia Silva Stanton, *Payments for Freshwater Ecosystems Services: A Framework for Analysis*, 18 HASTINGS W.-NW. J. ENVTL. L. & POL'Y 189, 219 (2012).

disputed that human life and health depends on the integrity of these services.[77] As the MA synthesis report puts it, "people are integral parts of ecosystems and . . . a dynamic interaction exists between them and other parts of ecosystems, with the changing human condition driving, both directly and indirectly, changes in ecosystems and thereby causing changes in human well-being."[78] The report concludes, "The human species, while buffered against environmental changes by culture and technology, is fundamentally dependent on the flow of ecosystem services."[79]

The effort to describe these services and quantify them in precise economic terms is itself a "vulnerability" project: an effort to make human vulnerability visible within conventional economics. As Douglas Kysar puts it, "ecological economists view the human economy as a subsystem of the environment, while conventional economists view the environment as a subsystem of the economy."[80] From an ecological economist's perspective, the conventional view assumes human invulnerability, creating the risk that unending economic growth will eventually threaten the carrying capacity of the earth.[81] Ecological economics, and projects such as measurements of and payments for ecological services, attempt instead to recognize the natural limits of human markets.[82]

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77.   *See* Daily, *supra* note 65, at 3–5 (analogizing colonizing the moon to highlight the necessity of viable ecosystem services).

78.   *See* MILLENNIUM ECOSYSTEM ASSESSMENT, *supra* note 64, at v. The MEA identifies human well-being as containing multiple constituents, including "*the basic material for a good life*, such as secure and adequate livelihoods, enough food at all times, shelter, clothing, and access to goods; *health*, including feeling well and having a healthy physical environment, such as clean air and access to clean water; *good social relations*, including social cohesion, mutual respect, and the ability to help others and provide for children; *security*, including secure access to natural and other resources, personal safety, and security from natural and human-made disasters; and *freedom of choice and action*, including the opportunity to achieve what an individual values doing and being." *Id.*

79.   ECOSYSTEMS AND HUMAN WELL-BEING: CURRENT STATE AND TRENDS, *in* 1 MILLENNIUM ECOSYSTEM ASSESSMENT, at vii (Rashid M. Hassan et al. eds., 2005).

80.   Kysar, *Law, Environment, and Vision*, *supra* note 24, at 728.

81.   *See id.* at 676 (arguing that mainstream economics fails to fully recognize the limits of the environment, and therefore fails to provide a sound basis for policymaking).

82.   *See id.* at 677 ("Significantly, ecological economists rely on a

Global climate change represents the most dramatic example of this indivisibility of humans and "the environment." For instance, in its Fifth Assessment Synthesis Report, released in 2014, the Intergovernmental Panel on Climate Change underscored the close interrelationship between greenhouse gas emissions, large-scale ecosystem and trans-human system disruptions, and human life and health.[83] In this report, the IPCC stated with "high confidence" that global warming is anthropogenic—that is, caused by human activity.[84] Moreover, according to the IPCC the physical effects of global warming now threaten human life and human institutions. Summarizing recent changes in atmospheric and oceanic systems as well as taking note of species extinctions, the IPCC identified threats to food production and to water availability and supply as two specific examples of increased human vulnerability caused by global climate change.[85] The IPCC report predicts, with a high degree of confidence, increases in human ill-health for the remainder of the twenty-first century.[86] In the longer term, the report predicts—again with a high level of confidence—that "[w]ithout additional mitigation efforts beyond those in place today, and even with adaptation, warming by the end of the 21st

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preanalytic vision of human activity that is presumed to be bounded by natural constraints.").

83.   SEE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2014 SYNTHESIS REPORT: SUMMARY FOR POLICYMAKERS 15–16 (Rajendra K. Pachauri et al. eds., 2014), *available at* http://www.ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_SPMcorr1.pdf (reporting the predicted effects of climate change on urban and rural areas as well as its effects on economies and poverty) (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT).

84.   *Id.* at 4 ("Anthropogenic greenhouse gas emissions have increased since the pre-industrial era, driven largely by economic and population growth, and are now higher than ever. This has led to atmospheric concentrations of carbon dioxide, methane and nitrous oxide that are unprecedented in at least the last 800,000 years. Their effects, together with those of other anthropogenic drivers, have been detected throughout the climate system and are extremely likely to have been the dominant cause of the observed warming since the mid-20th century.").

85.   *See id.* at 15–16 (listing the predicted effects of climate change on various human populations).

86.   *See id.* at 15 (expecting with "high confidence" that "[t]hroughout the 21st century, climate change is expected to lead to increases in ill-health in many regions).

century will lead to high to very high risk of severe, widespread, and irreversible impacts globally."[87] This assessment supports the conclusion that as a species, humanity's fate is tied up with that of "the environment," and that to attempt to promote human flourishing without regard to ecosystem functioning would be a grave mistake in the Anthropocene era.

Finally, the IPCC report recognizes that political and social relationships and institutions mediate the effects of global climate change, and that the projects of mitigation and adaptation raise issues of equity, justice, and fairness.[88] We will return to this point below.

2. *"Inside Ecologies:" Micro-Level Vulnerability*

The trans-human nature of the embodied self, and the vulnerability that it entails, extends not only into the macro-realm of ecosystems but also into the micro-realm of human biology. It is, of course, obvious that human beings are in constant interaction with their environments.[89] Recent

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87. *Id.* at 18. For example, the report identifies five "Reasons For Concern" (RFCs), defined as "aggregate climate change risks" that "illustrate the implications of warming and of adaptation limits for people, economies, and ecosystems across sectors and regions." *Id.* These RFCs are associated with: "(1) [u]nique and threatened systems, (2) [e]xtreme weather events, (3) [d]istribution of impacts, (4) [g]lobal aggregate impacts, and (5) [l]arge-scale singular events." *Id.* Each RFC is an example of human vulnerability in the face of continued global warming.

88. *See id.* at 17 (explaining how equity, justice, and fairness should be included in developing mitigation strategies).

89. As Bonnie Spanier puts it:
[O]rganisms do not exist apart from their environs or from other organisms. Not only are organisms surrounded by and embedded in a dynamic interaction with their environs—and in that sense are contiguous with it—but we are contiguous with the environment from the inside as well, whether through our digestive and respiratory tracts, our skin pores, or the network of endoplasmic reticulum throughout the cytoplasm of many types of cells. . . . A very different psychology of self and other would understand our beings as open to and connected with the environment around us through our external and internal surfaces, as well as what we project of ourselves (our exhalations, body head radiation, wastes, etc.).

BONNIE B. SPANIER, IMPARTIAL SCIENCE: GENDER IDEOLOGY IN MOLECULAR

developments in microbiology, however, reveal in startling detail that each individual human body can be understood as a complex ecosystem made up of interdependent living entities, and that the whole's survival and flourishing depends on the health of the individual parts and their interrelations.[90]

The Human Microbiome Project (hereafter HMP), a multi-national scientific endeavor building on the Human Genome Project, is on the cutting edge of this research.[91] For example, HMP scientists have discovered approximately 100 trillion "good bacteria" that live in and on each human body.[92] This human "microbiome" performs a number of important services, including food digestion, synthesis of vitamins, and protection against disease-causing bacteria.[93] Malfunctions in the microbiome,

BIOLOGY 89 (1995). Richard Lewontin concurs: "[O]rganisms do not simply use resources present in the environment but, through their life activities, produce such resources and manufacture their environments." Richard Lewontin, *It's Even Less in Your Genes*, THE NEW YORK REVIEW OF BOOKS (May 26, 2011), *available at* http://www.nybooks.com/articles/archives/2011/may/26/its-even-less-your-genes/ (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT). According to Lewontin, this view is shared by renowned scientist Evelyn Fox Keller. In a review of her book, *The Mirage of a Space Between Nature and Nurture,* Lewontin describes Keller's titular mirage as "our false division of the world into living objects without sufficient consideration of the external milieu in which they are embedded, since organisms help create effective environments through their own life activities." *Id.*

90.   *See generally* Peter J. Turnbaugh et al., *The Human Microbiome Project: Exploring the Microbial Part of Ourselves in a Changing World*, 449 NATURE 804 (Oct 18, 2007) (outlining "a strategy to understand the microbial components of the human genetic and metabolic landscape).

91.   *See* David A. Relman, *Microbiology: Learning About Who We Are*, 486 NATURE 194, 194 (Jun. 14, 2012) (listing efforts in various countries to study the human microbiome); *see also* Turnbaugh et al., *supra* note 90, at 804 ("The HMP is not a single project. It is an inter-disciplinary effort consisting of multiple projects, which are now being launched concurrently worldwide, including in the United States (as part of the next phase of the National Institutes of Health's Roadmap for Medical Research), Europe and Asia.").

92.   *See* Gina Kolata, *In Good Health? Thank your 100 Trillion Bacteria*, N.Y. TIMES (June 13, 2012), http://www.nytimes.com/2012/06/14/health/human-microbiome-project-decodes-our-100-trillion-good-bacteria.html?pagewanted=all&_r=0 (explaining the work and findings of the Human Microbiome Project) (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT).

93.   *See id.* (explaining the role of microbes in the human body). It appears that there are distinct communities of microbes that live in sites such

including disturbances caused by antibiotics, are now being linked to maladies such as metabolic syndrome (a precursor of Type II diabetes), obesity, and some infections.[94]

More broadly, the HMP's research has prompted a rethinking of how scientists define the human body. As one group of researchers associated with the HMP explains:

> [M]any were surprised and perhaps humbled by the announcement that the human genome contains only ~20,000 protein-coding genes, not much different from the fruitfly genome. However, if the view of what constitutes a human is extended, then it is clear that 100,000 genes is probably an under-estimate. The microorganisms that live inside and on humans (known as the microbiota) are estimated to outnumber human somatic and germ cells by a factor of ten. Together, the genomes of these microbial symbionts (collectively defined as the microbiome) provide traits that humans did not need to evolve on their own. If humans are thought of as a composite of microbial and human cells, the human genetic landscape as an aggregate of the genes in the human genome and the microbiome, and human metabolic features as a blend of human and microbial traits, then the picture that emerges is one of a human 'supra-organism.'[95]

The journalist Michael Pollan puts it this way:

> It turns out that we are only 10 percent human: for every human cell that is intrinsic to our body, there are about 10 resident microbes—including

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as the skin, in the gut, and in the vagina, and that there is surprising diversity among individuals in the composition of these microbial populations. *See generally*, THE HUMAN MICROBIOME PROJECT CONSORTIUM, *Structure, Function, and Diversity of the Healthy Human Microbiome*, 486 NATURE 207, 207 (June 14, 2012) (setting out results of the "largest cohort and set of distinct, clinically relevant body habitats so far").

94.   *See* Kolata, *supra* note 92 (discussing how essential these bacteria are to human health and functioning).

95.   Turnbaugh et al., *supra* note 90, at 804 (citations omitted).

commensals (generally harmless freeloaders) and
mutualists (favor traders) and, in only a tiny
number of cases, pathogens. To the extent that we
are bearers of genetic information, more than 99
percent of it is microbial.[96]

As a consequence of this discovery, "[h]uman health
should now 'be thought of as a collective property of the human-
associated microbiota,' as one group of researchers recently
concluded in a landmark review article on microbial ecology—
that is, as a function of the community, not the individual."[97]
Microbiologists have borrowed terms and concepts from ecology in
order to express this new understanding of the human being as a
collective. For instance, one article asserts that "each person can
be viewed as an island-like 'patch' of habitat occupied by
microbial assemblages formed by the fundamental processes of
community ecology: dispersal, local diversification, environmental
selection, and ecological drift."[98] Pollan quotes Justin
Sonnenburg, a microbiologist at Stanford University, who even
suggests that "we would do well to begin regarding the human
body as 'an elaborate vessel optimized for the growth and spread
of our microbial inhabitants.'"[99] From the perspective of research
on the microbial biome, humans and microbes are
interdependent, forming complex systems that defy the
conventional understanding of human beings are distinct and

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96.   Michael Pollan, *Some of My Best Friends Are Germs*, N.Y.
TIMES, May 15, 2013, .http://www.nytimes.com/2013/05/19/magazine/say-hello-
to-the-100-trillion-bacteria-that-make-up-your-
microbiome.html?pagewanted=all (on file with the WASHINGTON AND LEE
JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT).
97.   *See id.* (citing Courtney J. Robinson, Brendan J.M. Bohannan
& Vincent B. Young, *From Structure to Function: the Ecology of Host-Associated
Microbial Communities*, 74 MICROBIAL AND MOLECULAR BIOLOGY REV. 453
(2010)).
98.   Elizabeth K. Costello et al., *The Application of Ecological
Theory Toward an Understanding of the Human Microbiome*, 336 SCIENCE 1255,
1255   (June   2013),   *available   at*
www.sciencemag.org/content/336/6086/1255.full.pdf   (on   file   with   the
WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT).
99.   Pollan, *supra* note 96.

independent living entities.[100] "The" embodied self is not singular at all, but rather a community of co-evolving species.[101]

One implication of this framing of the human being as a collective or an ecosystem is a new appreciation of human vulnerability.[102] Commenting on several recent studies, David A. Relman writes, "We are essentially blind to many of the services that our microbial ecosystems provide—and on which our health depends—and investigators desperately need new approaches for studying interactions between members of the microbial community and their human hosts."[103] One area of concern is the widespread use of antibiotics in the Western world, not only to treat diseases but as a preventive measure in industrial agriculture and in a wide range of domestic consumer uses.[104] Another ongoing area of research is the extent to which childhood exposure to microbes protects health, by preventing the development of allergies and possibly other autoimmune disorders.[105] Meanwhile, Pollan reports, "[a] handful of

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100. *See id.* (arguing that human health should be considered "as a function of the community, not the individual").

101. *See id.*, (explaining that the human immune system must "learn to consider our mutualists—e.g., resident bacteria—as self too") (quoting Michael Fischbach).

102. *See* Sabrina Tavernise, *Antibiotics in Animals Tied to Risk of Human Infection*, N.Y. TIMES (January 28, 2014), www.nytimes.com/2014/01/28/science/antibiotics-in-animals-tied-to-risk-of-human-infection.html (discussing the unforeseen consequences for human health from giving antibiotics to livestock) (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT).

103. Relman, *supra* note 91, at 195 (citations omitted).

104. *See, e.g.*, Tavernise, *supra* note 102; Sabrina Tavernise, *F.D.A. Restricts Antibiotics Use for Livestock*, N.Y. TIMES, December 11, 2013, http://www.nytimes.com/2013/12/12/health/fda-to-phase-out-use-of-some-antibiotics-in-animals-raised-for-meat.html?pagewanted=all (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT); Sabrina Tavernise, *F.D.A. Questions Safety of Antibacterial Soaps*, N.Y. TIMES (December 16, 2013), http://www.nytimes.com/2013/12/17/health/fda-to-require-proof-that-antibacterial-soaps-are-safe.html (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT).

105. *See, e.g.*, Jane E. Brody, *Eating Dirt Can Be Good For You – Just Ask Babies*, N.Y. TIMES (January 27, 2009), http://www.nytimes.com/2009/01/27/health/27iht-snbabies.1.19711937.html?pagewanted=all (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT); Anahad O'Connor, *Sucking Your Child's Pacifier Clean May Have Benefits*, N.Y. TIMES (May 6, 2013), http://well.blogs.nytimes.com/2013/05/06/why-dirty-pacifiers-may-be-

microbiologists have begun sounding the alarm about our civilization's unwitting destruction of the human microbiome and its consequences. Important microbial species may have already gone extinct, before we have had a chance to learn who they are or what they do."[106] The microbial interchanges between human beings and nonhuman entities and environments make visible the extent to which human existence is an emergent property, made possible only through complex trans-human processes that make us vulnerable in ways we do not even yet fully understand.

C. Summary: Ecological Vulnerability

Just as the feminist "dependency critique"[107] refocused attention from the autonomy of adult individuals to the webs of social dependency and interdependency that sustain the rights-bearing subject, recent developments in economics and the natural sciences require us to reject the idea of an autonomous political subject separate and distinct from an inert "environment."[108] Humans are dependent not only on one another but on a series of trans-human systems, and this interdependence is a source of resilience—and vulnerability.[109]

Recognizing that human beings are born, age, sicken, and die is the first step to recognizing that theories of political existence and obligation must take account of the natural world. If the state is to be fully responsive to all the conditions beyond the individual's control that affect his or her ability to flourish, as Fineman suggests, then it must take into account the internal

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your-childs-friend/ (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT).

    106.   Pollan, *supra* note 96.

    107.   See EVA FEDER KITTAY, LOVE'S LABOR: ESSAYS ON WOMEN, EQUALITY, AND DEPENDENCY 18 (1999) (noting the source of the phrase "dependency critique" and describing the it as an effort to enlarge our conception of equality to include the "values and virtues of care").

    108.   *See* BENNETT, *supra* note 1, at 110–12 (questioning whether the belief that the environment is responsive to human actions is the most effective way to understand the relationship between humans and non-humans).

    109.   *See id.* at 116 ("It is futile to seek a pure nature unpolluted by humanity, and it is foolish to define the self as something purely human. . . A vital materialism . . . recasts the self in the light of its intrinsically polluted nature and in so doing recasts what counts as self-interest.").

and external ecologies in which humans are situated. "Ecological vulnerability" recognizes that human lives are part of complex ecosystems that operate on various levels of scale, from the local to the global. Particularly in the age of the Anthropocene, when human activity is rapidly causing large-scale, not fully predictable, and potentially irreversible changes to our inner and outer environments, the fully responsive state should recognize that soil degradation, water scarcity, warming oceans, and depleted fishing stocks structure our options and create opportunities just as market and family relations do. In the age of the Anthropocene, it can no longer be argued that these environmental processes and events are outside the circle of justice. "Human behavior" and "the natural world" are now locked in an ever-tightening feedback loop. To care for its citizens, the responsive state must care for the systems that make its citizens' flourishing possible.

Advances in microbiology as well as ecological economics underscore the recognition of interdependency on which ecological vulnerability analysis rests. As the previous section outlined, humans depend on complex but as-yet poorly understood microbial ecosystems for life and health. To fully respond to embodied humans who, among other things, fall ill and die, the responsive state must pay attention to the processes that sustain and threaten its citizens' bodies. Moreover, just as the health of macro-ecosystems is closely tied to the operation of human institutions, especially economic institutions, so the health of our micro-ecologies is affected by human behavior, including the practices of industrial agriculture.[110] The feedback loops in which humans are embedded in the microbial world must be reflected in feedback loops of governance.

Ecological vulnerability recognizes that the responsive state's political obligations entail obligations to nonhuman entities and processes. Taking the full measure of human vulnerability means recognizing the "interbeing" of humanity with nonhuman and trans-human systems and entities. Ecological vulnerability thus expands our concept of what it means to be a citizen.

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110. See *supra* note 102, 104 and 105 and accompanying text (sources discussing the role of antibiotics in disrupting human microbiomes).

III. *Some Governance Implications of Ecological Vulnerability*

As Part II argued, ecological economists, climate scientists, and microbiologists have begun to increasingly appreciate the fragile materiality of human existence. Not only is each human being "embodied" in a life course, subject to growth, aging, illness, and death; embodiment entails enmeshment in complex trans-human systems on macro- and micro-levels that are essential to human survival and flourishing. What are the implications for political and legal theory of reframing the rights-bearing self and the state in this way?

A number of scholars from various fields that take embodiment seriously—including feminist theory, materialist theory, political theory, environmental humanities, and public health—explore the political implications of the idea that "humans" and "the environment" are not separate and distinct, and that "the environment" is not an inert space in which humans exercise agency.[111] The new theories of materiality and embodiment described in subsection A of this Part rewrite the imaginary "state of nature" that the classic liberal political philosophers—including Thomas Hobbes, John Locke, and Jean-Jacques Rousseau—used as their backdrop for imagining the social contract. New theories of materialism and the body treat the "state of nature" as a dynamic flux of human and nonhuman relations.[112] From this reimagined state of nature might emerge a "natural contract" within which the social contract is embedded—not to mention, as one of the wilder theoretical visions has it, a "viscous porosity" beyond the reach of conventional politics, where "[w]ord, flesh, and dirt are no longer discrete."[113]

Building on this literature, subsection B sets out two foundational principles or commitments that might guide political and legal thought under an ecological vulnerability

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111.   *See supra* note 32 and accompanying text.
112.   *See* BENNETT, *supra* note 1, at x (introducing the importance of nonhumans interacting with humans).
113.   STACY ALAIMO, BODILY NATURES: SCIENCE, ENVIRONMENT, AND THE MATERIAL SELF 14 (2010) (citing Nancy Tuana, *Viscous Porosity: Witnessing Hurricane Katrina*, *in* MATERIAL FEMINISMS 188 (Stacy Alaimo & Susan Henkman eds., 2007)).

framework. The first is the principle that environmental protection and the protection of human rights are inextricably intertwined. The second is a principle that we might name simply "humility," but which appears in the critical literature as the anti-subordination principle. These two principles, I suggest, ought to be considered central to a legal theory of ecological vulnerability.

To fully flesh out how these two principles might be reflected in legal doctrine is beyond the scope of this Article. In Subsection C, however, I identify some models for this project, already visible in the literature of "just sustainabilities," in the work of the environmental justice movement, and in recent legal developments in Latin America.

A. Theories of Materiality: Reenvisioning the "State of Nature"

In the last decade of the twentieth century and into the first decade of the twenty-first, social theorists in a number of disciplines began to chafe against the assumption that everything important to human relations is "socially constructed."[114] A new literature, described as the "materialist turn," has emerged asserting a role for the non-human and the trans-human in social relations and institutions.[115]

The "social construction thesis" originally arose as a way to counter the claim that social hierarchies of race, gender, disability and sexuality are the result of "nature" and therefore are unchangeable and nonpolitical.[116] For example, critical race theorists argue vigorously that humans are not divided into races the way animals are divided into species; that the physical differences people associate with "race" are matters of convention and do not represent an underlying biological reality; and that

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114. *See infra* notes 116–19 and accompanying text.

115. *See infra* note 120 and accompanying text.

116. *See* Ron Mallon, *A Field Guide to Social Construction*, 2 PHIL. COMPASS 94, 102 (2007) ("Talk of social constructions has been a provocative, if sometimes confusing, spur to consider historical, cultural, and personal details that shape our theories, our social worlds, and ourselves."); *see also* IAN HACKING, THE SOCIAL CONSTRUCTION OF WHAT? 6 (1999) (explaining that "[s]ocial construction work is critical of the status quo. Social constructionists of X tend to hold that: (1) X need not have existed, or need not be at all as it is.").

who counts as a "white person," a "black person," or an "Asian" person is determined primarily by history and politics rather than science.[117]

The social construction thesis has not only been the basis for theoretical challenges to white supremacy and male domination, but also a powerful springboard for social action on behalf of equality.[118] Over time, however, the claim that a thing was "socially constructed" became practically a reflex in some

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117.   *See Mallon, supra* note 116 at 97 (discussing how constructive theory argues that human attributes like race are defined through social interactions, rather than being innate characteristics of humans). Critical race theorists in law, for instance, argue that legal institutions help determine what "race" means. *See generally* IAN HANEY LOPEZ, WHITE BY LAW: THE LEGAL CONSTRUCTION OF RACE (1997) (showing how the Supreme Court's interpretation of the federal naturalization laws helped determine which individuals and groups were deemed "white" in American history); ARIELA J. GROSS, WHAT BLOOD WON'T TELL: A HISTORY OF RACE ON TRIAL IN AMERICA (2008) (arguing that courtroom trials to determine the race of an individual have often turned more on that individual's social ties and self-presentation than on ancestry and appearance).

One of the most extensive applications of the social construction thesis is its use to support women's equality. *See* HACKING, *supra* note 116, at 7 ("One core idea of early gender theorists was that biological differences between the sexes do not determine gender, gender attributes, or gender relations. Before feminists began their work, this was far from obvious.").

118.   To take a recent example, the social construction thesis has been used in the context of disability rights to counter the notion that "handicapped" people are naturally unable to participate in mainstream society. As Michael Ashley Stein and Penelope J.S. Stein explain, disability rights advocates have adopted a "social model" of disability rather than the medical model. *See* Michael Ashley Stein & Penelope J.S. Stein, *Beyond Disability Civil* Rights, 58 HASTINGS L.J. 1203, 1203 (2007). Under the social model of disability, disability arises through a combination of natural capacities and institutional arrangements. *See id.* at 1206–07. The equality principle requires that the state rectify institutional arrangements that impede the full participation of "disabled" people in social and political activities. *See id.* at 1205–06. This model has had important legal and policy implications; as they note, the landmark federal Americans with Disabilities Act "was premised on the social model's belief that peoples' functional limitations are caused by the socially constructed environment, such that the repercussions of having a disability are mutable." *Id.* at 1209. Stein notes that this social constructionist model of disability built on theories of social construction that similarly framed race and gender as "socially constructed" rather than "natural" categories of existence. *See* Michael Ashley Stein, S*ame Struggle, Different Difference: ADA Accommodations as Antidiscrimination*, 153 U. PA. L. REV. 579, 604 (2004).

academic quarters.[119] The "materialist turn" in the humanities emerged as a challenge to this reflex. Materialist scholars acknowledge that not everything is socially constructed. They are interested in what lies beyond human institutions, perceptions, concepts, and decisions, including nonhuman actors and processes and the relationships between humans and nonhumans.[120]

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119. Ian Hacking, for instance, was able to fill an entire page with book titles that included the term "social construction." See HACKING, *supra* note 116, at 1. Hacking comments, "Talk of social construction has become common coin, valuable for political activists and familiar to anyone who comes across current debates about race, gender, culture, or science." *Id.* at 2.

120. One important thread of the materialist turn comes through feminist theory. Feminist theorists initially divided "gender" from "sex" as a way of supporting the argument that conventional sex roles are not biologically but rather politically, historically, and socially determined. *See* Nancy Tuana, *Fleshing Gender, Sexing the Body: Refiguring the Sex/Gender Distinction*, 35 S. J. OF PHIL. 53, 54–55 (1996) (quoting ANNE MINAS, GENDER BASICS: FEMINIST PERSPECTIVES ON WOMEN AND MEN 4 (1993)). In this distinction, "sex" represented what was given by nature and "gender" what was culturally negotiated, and the feminist argument was that "gender" was much more significant than most people assumed. *Id.* Introducing the notion of gender marked the issue of women's capacities as political, not simply a matter for scientific experts. *Id.* However, the sex-gender binary was also problematic, both because of its instability (where does one draw the line between culture and biology?), and because it left the (natural) body outside feminism. *Id.* at 55. Feminist theorists like Elizabeth Grosz began to reject the distinction altogether and to claim "the body" as an object that belonged neither to nature nor to culture, but equally to both. ELIZABETH GROSZ, VOLATILE BODIES: TOWARD A CORPOREAL FEMINISM 23 (1994). Grosz, for example, described the body as a "threshold or borderline concept that hovers perilously and undecidably at the pivotal point of binary pairs. The body is neither—while also being both—the private or the public, self or other, natural or cultural, psychical or social, instinctive or learned, genetically or environmentally determined." *Id.* By the 2000s, a number of feminists had joined Grosz and called for "material feminisms." *See generally*, MATERIAL FEMINISMS (Stacy Alaimo & Susan Hekman eds., 2008) (collection of essays embracing material feminism).

A second element of the materialist turn comes from science and technology studies. In a landmark essay published in the mid-1980s, Donna Haraway sought to break down a number of theoretical dichotomies that in her view were not helpful to progressive social theory, including the dichotomy between "nature" and "culture." Donna Haraway, *A Manifesto for Cyborgs: Science, Technology, and Socialist Feminism in the 1980s*, 80 SOCIALIST REVIEW 65, 71 (1985). A philosopher of science, Haraway argued that an anti-scientific, anti-technological search for organic authenticity and purity too often motivated progressive political thinking, and she celebrated the "cyborg"—a figure neither purely natural nor purely artificial—as a more appropriate subject of

contemporary times. *Id.* at 74–76. Haraway's work, in turn, explicitly rested on the work of women of color theorists, such as Chela Sandoval, Gloria Anzaldua, and Cherrie Moraga, who emphasized "hybridity," *mestizaje*, and "racial borderlands" as key terms for anti-subordinationist theorizing. *Id.* at 73–74, 94–95; *see also generally* Chela Sandoval, *U.S. Third World Feminism: The Theory and Method of Oppositional Consciousness in the Postmodern World*, 10 GENDERS 1 (1991) (explaining the hybrid character of differential consciousness in that it attempts to unite multiple, seemingly different, ideologies); GLORIA ANZALDUA, BORDERLANDS / LA FRONTERA: THE NEW MESTIZA (4th ed. 2012) (compilation of poetry and essays describing the hybrid identity of a Chicana and lesbian activist); THIS BRIDGE CALLED MY BACK: WRITINGS BY RADICAL WOMEN OF COLOR (Cherríe Moraga & Gloria Anzaldua eds., 3rd ed. 2002) (highlighting third world feminists' struggles amidst white feminism). More recently, physicist and feminist Karen Barad argues that quantum theory has important implications for philosophy and social theory because it similarly scrambles binary terms like nature and culture. *See* KAREN BARAD, MEETING THE UNIVERSE HALFWAY: QUANTUM PHYSICS AND THE ENTANGLEMENT OF MATTER AND MEANING 26–27 (2007).

Meanwhile, science and technology scholars such as Bruno Latour came to their interest in materiality through suspicion of the conventional methods and assumptions of sociology, which place "the social" and thus human action at the center of everything important. *See, e.g.,* BRUNO LATOUR, REASSEMBLING THE SOCIAL: AN INTRODUCTION TO ACTOR-NETWORK THEORY 75 (2005) (highlighting the constraints of viewing from a social perspective). One outgrowth of their resistance to traditional sociology is "actor-network theory" or ANT, also called "material semiotics." This approach to science and technology refuses to privilege human activities and actors; it instead views "all kinds of actors including objects, subjects, human beings, machines, animals, 'nature,' ideas, organizations, inequalities, scale and sizes, and geographical arrangements" as equally deserving of curiosity and interest in the working of complex systems, rather than automatically giving human "social" categories, intentions, and interests pride of place. *See* John Law, *Actor Network Theory and Material Semiotics*, *in* THE NEW BLACKWELL COMPANION TO SOCIAL THEORY 141 (Bryan S. Turner ed., 2009) (introducing actor network theory).

Yet a third element of the materialist turn is the environmental humanities and the study of "material culture." *See generally,* LINDA NASH, INESCAPABLE ECOLOGIES: A HISTORY OF ENVIRONMENT, DISEASE, AND KNOWLEDGE (2006); Margaret FitzSimmons and David Goodman, *Incorporating Nature: Environmental Narratives and the Reproduction of Food*, *in* REMAKING REALITY: NATURE AT THE MILLENNIUM 194 (Bruce Braun & Noel Castree eds., 1998) (arguing how nature should be included in social theory); BILL BROWN, A SENSE OF THINGS: THE OBJECT MATTER OF AMERICAN LITERATURE (2003). These scholars look at the social world through objects and nonhuman systems, and like Grosz and Haraway treat nature and culture not as opposites but as thoroughly entangled.

Finally, philosophy, especially its phenomenology branch, and political theory have contributed to materiality theory. *See generally* BENNETT, *supra* note 1 (explaining how political theory has contributed to materiality theory);

Out of materialist theory comes a dynamic and reciprocal systems view of the relationship between humans and the environment. Stacy Alaimo, for instance, has argued, "the environment, which is too often imagined as inert, empty space or as a resource for human use, is, in fact, a world of fleshy beings with their own needs, claims, and actions."[121] Alaimo calls her analytic framework "trans-corporeality," and argues that the concept "opens up a mobile space that acknowledges the often unpredictable and unwanted actions of human bodies, nonhuman creatures, ecological systems, chemical agents, and other actors."[122] Similarly, Elizabeth Grosz argues that people "need to understand the body, not as an organism or entity in itself, but as a system, or series of open-ended systems, functioning within other huge systems it cannot control through which it can access and acquire its abilities and capacities."[123] This understanding lies close to the understanding of the human body within disability studies. For instance, Rosemarie Garland-Thompson writes, "[A]ll bodies are shaped by their environments from the moment of conception. We transform constantly in response to our surroundings and register history on our bodies. The changes that occur when body encounters world are what we call disability."[124]

SARA AHMED, QUEER PHENOMENOLOGY: ORIENTATIONS, OBJECTS, OTHERS (2006) (explaining that queer phenomenology highlights "how bodies become orient[ed] by how they take up time and space"); IAN BOGOST, ALIEN PHENOMENOLOGY, OR WHAT IT'S LIKE TO BE A THING (2012) (arguing that humans should not be the center of philosophy but rather on a equal plane with the rest of the elements of the world).

    For a good overview of the materialist turn and a useful reflection on the relationship between the new materialist scholarship and more traditional scholarship in political economy, *see generally* Christopher Breu, *The Insistence of the Material: Theorizing Materiality and Biopolitics in the Era of Globalization*, (Institute on Globalization and the Human Condition, Globalization Working Papers 12/2, 2012), *available at* socialsciences.mcmaster.ca/institute-on-globalization-and-the-human-condition/documents/IGHC-WPS_12-2_Breu.pdf (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT).

    121.   ALAIMO, *supra* note 113, at 2.

    122.   *Id.*

    123.   ELIZABETH GROSZ, THE NICK OF TIME: POLITICS, EVOLUTION, AND THE UNTIMELY 3 (2004).

    124.   Rosemarie Garland-Thomson, *Disability and Representation*, 120 PROCEEDINGS OF THE MODERN LANGUAGE ASSOCIATION 522, 524 (2005).

Political theorist Jane Bennett, who attempts to investigate "the vitality of matter" and attributes agency to nonhuman objects, concedes that her seemingly contradictory and quixotic endeavor is designed to interrogate human means and ends:

> [M]y hunch is that the image of dead or thoroughly instrumentalized matter feeds human hubris and our earth-destroying fantasies of conquest and consumption. It does so by preventing us from detecting (seeing, hearing, smelling, tasting, feeling) a fuller range of the nonhuman powers circulating around and within human bodies. . . . The figure of an intrinsically inanimate matter may be one of the impediments to the emergence of more ecological and more materially sustainable modes of production and consumption.[125]

Bennett thus seeks to bring the nonhuman into political theory in the service of a humanist goal, "a self-interested or conative concern for human survival and happiness."[126] She cites social theorist Felix Guattari, who notes that because the health of the planet is increasingly reliant on human intervention, a politics that relies on keeping nature safe from humans will soon be ineffective.[127] Instead, Guattari argues, people should stop trying to disentangle nature from culture and understand the environmental, social, and psychic realms as intertwined: "if we have a humanistic interest in a richer kinship, marital, or civic life, we had better pursue a more ecological sustainable relationship with nonhuman nature."[128] Guattari concludes that "a greener self-culture-nature will require not only new 'laws, decrees and bureaucratic programmes' but 'new micropolitical

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125.   BENNETT, *supra* note 1, at ix.

126.   *See id.* at ix–x (describing Bennett's goal in using dominance theory in relation to environmentalism).

127.   *See id.* at 114 (citing FELIX GUATTARI, THREE ECOLOGIES 4 (1986) ("Structuralism and subsequently postmodernism, have accustomed us to a vision of the world drained of the significance of human interventions embodied as they are in concrete politics and micropolitics.").

128.   *See* BENNETT, *supra* note 1, at 113 (citing GUATTARI, *supra* note 127, at 27).

and microsocial practices, new solidarities, a new gentleness, together with new aesthetic and new analytic practices regarding the formation of the unconscious.'"[129] Similarly, Bruno Latour understands the modern self as "entangled—cosmically, biotechnologically, medically, virally, pharmacologically—with nonhuman nature," and argues for a politics and for policies that openly acknowledge this fact rather than attempting to disentangle nature from non-nature.[130]

What distinguishes this "cyborg constitutionalism"[131] from conventional approaches to environmentalism is, first, an acceptance of the human proclivity for constantly altering our relationships with nonhuman environments, a penchant for transformation that Marx described as our "species-nature."[132] Materialist politics is not the kind of romantic environmentalism in which one denounces "technology" and seeks an imaginary past when people "lived in harmony with nature."[133] Second, a materialist approach to environmental politics displays humility about the possibilities of perfect knowledge of and control over either humans or their environments.[134] It acknowledges that nonhuman systems sometimes act as if they have a will of their own, a will that cannot always be anticipated in advance.[135] Materialist approaches to technology are thus distinguishable from the "posthuman" ideology popular in Silicon Valley circles,

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129.   BENNETT, *supra* note 1, at 114 (quoting GUATTARI, *supra* note 127, at 51).

130.   *See* BENNETT, *supra* note 1, at 115–16 (citing Bruno Latour arguing in favor of a holistic view of both human and nonhuman nature).

131.   The term is a play on Donna Haraway's famous essay called "A Cyborg Manifesto." *See* Haraway, *A Manifesto for Cyborgs*, *supra* note 120.

132.   *See* Angela P. Harris, *Compassion and Critique*, 1 COLUM. J. RACE & L. 326, 333 (2012) ("[I]ntrinsic to human species-being is the capacity and urge to make things and, in the process, to re-create oneself and all of nature.").

133.   For a critique of this fantasy as applied to representations of the Amazon, see Candace Slater, *Amazonia as Edenic Narrative*, *in* UNCOMMON GROUND: RETHINKING THE HUMAN PLACE IN NATURE 114 (William Cronon ed., 1996).

134.   *See* BENNETT, *supra* note 1, at 113 (explaining the need for a joint view of both nature and culture).

135.   *See* ALAIMO, *supra* note 113, at 1 ("[T]rans-corporeality also opens up a mobile space that acknowledges the often unpredictable and unwanted actions of human bodies, nonhuman creatures, ecological systems, chemical agents, and other actors.").

which anticipates a technological "singularity," a moment in which human nature will be supplanted by a more perfect machine nature, either through technologically-assisted immortality of the body or forms of artificial intelligence that will surpass human intelligence.[136]

In line with this humility, materialist theorists reject the Enlightenment tradition that envisions Man as dominating Nature.[137] In the place of fantasies about perfect control over the material world, or submission to a perfect "second nature" emerging from technology, for example, Donna Haraway sees the ideal relationship between humans and nonhumans as a playful and reciprocal "worlding" among "companion species."[138] Although humans can and will attempt to get and keep the upper hand in these relationships, for Haraway the ultimate path of any worlding can neither be controlled nor even predicted.[139] In her view, "[t]here is no assured happy or unhappy ending—socially, ecologically, or scientifically. There is only the chance for getting on together with some grace."[140]

To conclude, theorists of materiality suggest that we should think of the human subject not as an autonomous and

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136.   *See generally* JARON LANIER, YOU ARE NOT A GADGET: A MANIFESTO (2011) (critiquing post-humanist thinking from the perspective of a Silicon Valley insider); EVGENY MOROZOV, TO SAVE EVERYTHING CLICK HERE: THE FOLLY OF TECHNOLOGICAL SOLUTIONISM (2013) (debating the credibility of technological solutionist views that technology can appropriately address complex social and environmental issues).

137.   *See generally* CAROLYN MERCHANT, THE DEATH OF NATURE: WOMEN, ECOLOGY, AND THE SCIENTIFIC REVOLUTION (1980) (providing a classic, explicitly feminist critique of Enlightenment theories of human dominance). Although this ideology is often associated with the Judeo-Christian tradition through the text in Genesis in which God gave dominion over the entire nature world to Adam in Genesis 1:25–27, it is possible to understand that text as requiring stewardship rather than raw exploitation. *See* MATTHEW SCULLY, DOMINION: THE POWER OF MAN, THE SUFFERING OF ANIMALS, AND THE CALL TO MERCY 70 (2002) (citing Roger Scrunton, *Eat Animals! Its' for Their Own Good*, L.A. TIMES (July 25, 1991), articles.latimes.com/1991-07-25/local/me-54_1_animal-rights (last visited Dec. 31, 2014) (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT).

138.   *See* DONNA J. HARAWAY, WHEN SPECIES MEET 182–83 (2008) (describing relationships between humans and competitive "companion species"—specifically retrieving dogs).

139.   *See* ALAIMO, *supra* note 113, at 2 (explaining the unpredictability of both human bodies, nonhuman beings, and nature itself).

140.   HARAWAY, WHEN SPECIES MEET, *supra* note 138, at 15.

active figure set in, or exercising dominion over, an inert and passive environment, but as a being that constantly interacts with nonhuman actors at various levels of scale, in ecologies small and large.[141] They adopt a vision of fundamental interdependence, not only with other humans but with nonhuman entities and processes.[142] Their contributions to a political theory of ecological vulnerability invite us to acknowledge, respond to, and even celebrate the "trans-corporeality" of human being.

B. Two First Principles of Governance in Light of Ecological Vulnerability

How might these ideas about "trans-corporeality" and "worlding" be reflected in law? In this subsection, I suggest two principles of governance from an ecological vulnerability perspective. The first is a commitment to seeing human rights and environmental sustainability as inextricably intertwined (the indivisibility principle). The second is a commitment to anti-subordination—a commitment that includes being willing to subject vulnerability analysis itself to critical scrutiny (the antidiscrimination principle).

1. The Indivisibility Principle

If the human subject is inextricable from its environment, care for macro- and micro-ecologies is a central and indispensable obligation of the state—a condition of the state's continued existence and legitimacy. Of course, governments already protect the environment in various ways. What ecological vulnerability requires is a recognition that the duty to protect the environment is on par with the duty to protect human rights.[143]

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141. *See* ALAIMO, *supra* note 113, at 2–3 (challenging the view that humans control the environment and suggesting that all beings are linked together and are interdependent).

142. *See id.* at 2 ("Imagining human corporeality as trans-corporeality, in which the human is always intermeshed with the more-than-human world, underlines the extent to which the substance of the human is ultimately inseparable from the environment.").

143. *See* Fineman, *Beyond Identities*, *supra* note 25, at 1727 (suggesting a positive duty of the state to act on behalf on humans by

The government might reflect this recognition in the form of strong constitutional or statutory norms, such as a "precautionary principle" to protect human health, various anti-pollution regimes, and commitments to public health, including, for example, principles of food justice.[144] More radically, such an obligation might destabilize the public-private split that characterizes Anglo-American jurisprudence, undermining the assumption that common law individualist rights of property and contract, for instance, are more fundamental than environmental obligations.[145] As in South Africa, where equality norms are considered "horizontal," applicable to private as well as public law, we could imagine norms of ecological sustainability that applied horizontally throughout private and public law, rather than vertically from public law down to certain aspects of private activity.[146] In these and other ways, the state should recognize sustainability as a fundamental value, not only by providing access to health care but by structuring family, market, and state

addressing external and environmental issues).

144 .   On the precautionary principle, see Frank B. Cross, *Paradoxical Perils of the Precautionary Principle*, 53 WASH. & LEE L. REV. 851, 851 (1996) ("The [precautionary] principle suggests that government should take precautions to protect public health and the environment, even in the absence of clear evidence of harm and notwithstanding the costs of such action."). On food justice, see ROBERT GOTTLIEB & ANUPAMA JOSHI, FOOD JUSTICE, at ix (2013) (describing the food justice movement as "related to three key arenas for action: (i) seeking to challenge and restructure the dominant food system, (ii) providing a core focus on equity and disparities and the struggles by those who are most vulnerable, and (iii) establishing linkages and common goals with other forms of social justice activism and advocacy—whether immigrant rights, worker justice, transportation and access, or land use.").

145.   *See* Fineman, *Beyond Identities*, *supra* note 25, at 1756 ("All individuals are dependent on society's institutions, be they deemed public or private and whether they are called family, market, or state entities, because it is through institutions that we gain access to resources with which to confront, ameliorate, satisfy, and compensate for our vulnerability."); *see also* Kysar, *Law, Environment, and Vision*, *supra* note 24, at 677 (arguing for private as well as public environmental rights).

146.   *See* ANNE HUGHES, HUMAN DIGNITY AND FUNDAMENTAL RIGHTS IN SOUTH AFRICA AND IRELAND 156–57 (2014) (analyzing South African law that incorporates a total consideration of human dignity to promote horizontal rights); Jeremy Sarkin, *The Drafting of South Africa's Final Constitution from a Human-Rights Perspective*, 47 AM. J. COMP. L. 67, 80 (1999) ("Significantly, the final Bill of Rights not only binds the state (vertical application) but, to the extent that the nature of the rights permits, it also binds private and juristic persons (horizontal application).").

activity around the recognition that life on earth depends on the continuing stability of certain crucial nonhuman systems and human-nonhuman interfaces and interactions.[147]

2. The Anti-subordination Principle

A second fundamental commitment necessary to a state responsive to ecological vulnerability is a commitment to the anti-subordination principle.[148] The anti-subordination principle is well-known and central to the work of critical legal scholars, from American Legal Realism through critical legal studies to critical race feminism.[149] In the context of ecological vulnerability, the anti-subordination principle corrects a weakness within vulnerability theory itself: its susceptibility to universalizing language and policies that ignore social injustice and thereby perpetuate it. Commitment to anti-subordination makes visible the role of power in how people are treated and in how policy frameworks are developed.

The international effort to curb global warming illustrates the pragmatic value of the anti-subordination principle as an element of environmental policy. Efforts to establish effective international treaties to curb global warming have in the past foundered on the problem of inequality between rich and poor countries.[150] As several scholars have noted, "expanding the pie"

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147. *See* Fineman, *Elderly as Vulnerable*, *supra* note 25, at 101 (noting a particularized need for states to address the vulnerability connected to health care).

148. *See* Ruth Colker, *Anti-Subordination Above All: Sex, Race, and Equal Protection*, 61 N.Y.U. L. REV. 1003, 1007 (1986) ("Under the anti-subordination perspective, it is inappropriate for certain groups in society to have subordinated status because of their lack of power in society as a whole.").

149. See Berta Hernández-Truyól, Angela Harris & Francisco Valdes, *Beyond the First Decade: A Forward-Looking History of LatCrit Theory, Community and Praxis*, 17 BERKELEY LA RAZA L.J. 169, 172–177 (2006) (tracing history of anti-subordination critique in the American legal academy from American Legal Realism through LatCrit theory).

150. J. Timmons Roberts and Bradley Parks explain that inequality hinders international climate policy agreement in direct and indirect ways. First, "The extreme poverty of dozens of nations and the relative powerlessness of a larger number leaves them without the capacity to negotiate effectively with the North and unable to meaningfully address their emissions of greenhouse gases because of their extremely undeveloped economies and

through economic growth has long been treated as the answer to global economic inequality.[151] If expanding the pie is no longer an option because of strict limits on fossil fuel use, however, then poor countries risk the inability to alleviate poverty through industrialization. Poor countries thus see climate change policy through a development lens, while rich countries tend to treat development issues as a distraction.[152]

Carmen Gonzalez argues that at the root of this division between the rich and poor countries is a historic injustice: colonialism, which created the conditions for centuries of global environmental degradation and also gave rise to the language of "race" to justify complex systems of environmental and economic exploitation and political subordination.[153] J. Timmons Roberts and Bradley Parks add that present-day socioeconomic inequalities stemming from this historic injustice are at the root of current tensions between rich and poor countries over climate adaptation and mitigation. They conclude, "Western nations need to wage a campaign to convince poor nations that they

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government agencies." J. TIMMONS ROBERTS & BRADLEY C. PARKS, A CLIMATE OF INJUSTICE: GLOBAL INEQUALITY, NORTH-SOUTH POLITICS, AND CLIMATE POLICY 8 (2007). Second, "The experience of poorer nations in the world economy and their interaction with rich nations across multiple issue areas has reinforced a worldview and a set of causal beliefs that are at odds with those of the wealthy nations; this has bred generalized mistrust and polarized expectations about how to proceed on climate issues." *Id.*

151.   *See, e.g.*, M'Gonigle & Takeda, *supra* note 24, at 1012 ("Economic growth, coupled with productivity-enhancing technology, has answered the demands of labor not by redistributing the economic pie, but by increasing its overall size."); Brian Gilmore, *The World Is Yours: "Degrowth," Racial Inequality and Sustainability*, 5 SUSTAINABILITY 1282, 1282–85 (2013) (introducing the problems with focusing on economic growth and calling for "degrowth").

152.   *See* ROBERTS & PARKS, *supra* note 150, at 229–30 (arguing that "the ongoing development crisis is at the very heart of the climate policy impasse" and that the "perception that the rich nations are promoting 'do-as-I-say-not-as-I-do' policies is particularly damaging because successful transitions from carbon-intensive to climate-friendly development pathways will require 'deep' cooperation between rich and poor nations, which must be underpinned by conditions of generalized trust and diffuse reciprocity.").

153.   *See* Carmen G. Gonzalez, *Environmental Justice and International Environmental Law*, Seattle University School of Law Legal Paper Series # 12–11, 7–8 (2012), *available at* http://ssrn.com/abstract=2011081 (explaining how colonialism established these roots of inequality) (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT).

understand and care about their position in the international division of labor and want to help them to escape the scourge of poverty and structural vulnerability."[154] A shared commitment to the anti-subordination principle in the context of environmental crisis may help rich and poor countries move toward such a "shared worldview," laying the foundation for the international trust and cooperation necessary to take comprehensive steps toward mitigation of and adaptation to global warming.[155]

Beyond this purely pragmatic argument, the anti-subordination principle elaborated by critical legal scholars also serves a related function: subjecting policy language and frameworks to critical scrutiny. Critical scholars have taken from postmodern theory a skeptical vigilance with regard to knowledge, especially taken-for-granted truths.[156] A commitment to anti-subordination in the form of such skeptical vigilance fosters both justice for persons (human and non-human) and humility with respect to our knowledge of, and capacity to wisely interact with, the non-human world.[157]

For example, Michael M'Gonigle and Louise Takeda observe that conventional environmental law and policy has until now taken place within a thoroughly "modernist" framework:

> [The assumptions of the modernist project] pervade environmental law: that (neutral) science can provide the knowledge to control environmental problems, and technology can provide the means; that markets can "internalize" externalities, and governments can act to make sure that they do if only they have "political will;" that progress is still possible under conditions and thinking inherited

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154.   ROBERTS & PARKS, *supra* note 150, at 217.

155.   *See id.* at 230 (endorsing the position that under circumstances of extreme mistrust, it is more important for states to work toward establishing a "shared worldview" than to provide "strategic reassurance.").

156.   *See generally* Angela P. Harris, *Foreword: The Jurisprudence of Reconstruction*, 82 CAL. L. REV. 741 (1994) (describing the "hermeneutics of suspicion" as a hallmark of critical race theory).

157.   *See* Roberto M. Unger, *The Critical Legal Studies Movement*, 96 HARV. L. REV. 561, 582 (1983) ("Every stabilized social world depends, for its serenity, upon the redefinition of power and preconception as legal right or practical necessity.").

from an age long passed. All we really need is to do
what is rational.[158]

These assumptions badly need critical scrutiny, and the
anti-subordination principle provides a vehicle for that scrutiny.
Keenly aware of the human capacity for bending rationality in
order to accommodate hierarchies of power, critical theorists
constantly search discourses of truth and claims to objectivity
and neutrality for evidence of bias.[159] The hermeneutics of
suspicion can yield a healthy humility and willingness to be self-
critical, qualities that are useful in a time of scientific
uncertainty when the stakes are higher than ever in human
history. Without this commitment, vulnerability theory lacks a
similar meta-commitment to self-critique; indeed, insofar as it
rests on the conception that there are some universal
characteristics of the human condition, it risks complacency that
we know who we are and what is to be done for everyone in the
world.[160]
    This point takes us to a central weakness in the term
"vulnerability" itself. This Article has argued that ecological
vulnerability, understood as a fundamental condition of human
existence to which the state must respond, usefully resituates the
human subject within a trans-human world that must be
protected and sustained in order for humanity itself to survive.[161]
As it happens, however, "vulnerability" is already a key word of

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158.   M'Gonigle & Takeda, *supra* note 24 at 1106.
159.   *See* Unger, *supra* note 157, at 582 (noting the importance of
critical theory in addressing social problems).
160.   *See* Ann-Belinda S. Preis, *Human Rights as Cultural Practice:
An Anthropological Critique*, 18 HUM. RTS. Q. 286, 288 (1996) (criticizing the
effects of cultural relativism). In the discipline of cultural anthropology, for
instance, postmodern theorists in the 1980s rebelled against their forerunners'
interest in identifying practices and ideals universal to all human cultures. *Id.*
In the name of "cultural relativism," anthropologists influenced by
postmodernism questioned whether there were any such universal practices,
and questioned whether, even if there were, the ability of Westerners to identify
and describe them without bias. *Id.*
161.   *See* Fineman, *Beyond Identities, supra* note 25, at 1754
("Considering the structural components of universal vulnerability raises a
paradox: while human vulnerability is initially conceptualized as universal and
constant, it also must be recognized that the experience of vulnerability is
particular, varied, and unique on the individual level.").

policy literature, and there it does not always mean what Fineman and I want it to mean.[162]

To begin with, the term is widely used but has no agreed-upon meaning. Hans-Martin Füssel observes:

> The ordinary use of the word "vulnerability" refers to the capacity to be wounded, i.e. the degree to which a system is likely to experience harm due to exposure to a hazard. The scientific use of "vulnerability" has its roots in geography and natural hazards research but this term is now a central concept in a variety of other research contexts such as ecology, public health, poverty and development, secure livelihoods and famine, sustainability science, land change, and climate impacts and adaptation. Vulnerability is conceptualized in very different ways by scholars from different knowledge domains, and even within the same domain. For instance, natural scientists and engineers tend to apply the term in a descriptive manner whereas social scientists tend to use it in the context of a specific explanatory model.[163]

The many different meanings and uses of "vulnerability" make possible not only confusion and uncertainty, but uses of the term that are precisely opposite to the purpose of ecological vulnerability analysis. Fineman acknowledges, for instance, that

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162.   The problem may begin with semantics. Hans- Martin Füssel's understanding of the ordinary meaning of the term as the capacity to be harmed describes a result, not the processes that led to the result. "Vulnerability" is easily made into an adjective characterizing people and groups, thus diverting attention from their institutional context.

Using the same word to describe universal aspects of the human condition and to describe the complex ways in which the lives of some people are made more precarious than others makes it easy to avoid the problem of political inequality. Although Fineman's argument that humans are all vulnerable (and that, at the same time, some are more vulnerable than others) makes perfect theoretical sense, the door is left open to mischief.

163.   Hans-Martin Füssel, *Vulnerability: A Generally Applicable Conceptual Framework for Climate Change Research*, 17 GLOBAL ENVTL. CHANGE 155, 155 (2007) (citations omitted).

"vulnerability" can be used as a stigmatizing label that is applied only to some humans. As she observes, "[T]hose who are not seen as sufficiently autonomous and independent actors are herded together in designated 'vulnerable populations' and are susceptible to monitoring, discipline, and supervision."[164] Fineman further observes, as we have seen, that populations considered insufficiently autonomous are often designated as either "deserving" or "undeserving."[165] The deserving vulnerable—like children—are treated with paternalism. The undeserving vulnerable—like the able-bodied poor—are managed through surveillance, discipline, and/or punishment.[166]

Another example of how easily Fineman's concept of vulnerability can be turned against itself can be taken from American environmental policy. "Plan EJ 2014" (Plan EJ) is a strategy document developed by the Environmental Protection Agency ("EPA") as part of its mandate to incorporate principles of environmental justice in the implementation of its rules and

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164.   Fineman, *Elderly as Vulnerable*, *supra* note 25, at 84.

165.   *See id.* at 79 (discussing the view of elderly citizens as those who have contributed to society and thereby are deserving of accommodation).

166.   *See id* at 85. Fineman puts it this way:

If someone is very young, profoundly ill or disabled, or very old, we may not be comfortable demanding they conform to the mandates of self-sufficiency and independence. They are perceived as needing protection, and paternalism guides society's response—which is to withhold agency, as is the case with children, or take away agency based on assumptions about lack of capacity, as we do with many of the elderly.

On the other hand, when someone is deemed a societal failure as the result of "choices" they have made, it is a different story. Poor single mothers, those who are unemployed and did not graduate from high school, those who were forced into default because they consented to terms in technically legal but morally indefensible contracts with aggressive financial institutions, and those who engaged in other risky or foolish behavior are seen as in need of discipline. We are concerned with the "moral hazard" implications should their bad choices be "rewarded" with societal support. . . .

The third group determined to be a vulnerable population includes those deemed deviant and dangerous, such as prisoners or so-called "youth-at-risk" who engage in aggressive anti-social behavior. This group is determined to need even more discipline and control. They are often separated out from society in facilities, segregated and punished for their choices and behavior. (citations omitted).

rulemaking.[167] Plan EJ does not use the word "vulnerable" in the main text of the document; instead, it speaks of "overburdened communities."[168] However, a footnote reveals that "overburdened communities" are defined in terms of vulnerability:

> In Plan EJ 2014, EPA uses the term "overburdened" to describe the minority, low-income, tribal, and indigenous populations or communities in the United States that potentially experience disproportionate environmental harms and risks as a result of greater vulnerability to environmental hazards. This increased vulnerability may be attributable to an accumulation of both negative and lack of positive environmental, health, economic, or social conditions within these populations or communities.[169]

This definition connects vulnerability to economic and social conditions, as Fineman argues it should.[170] Yet it does so in

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167.   *See* U.S. ENVIRONMENTAL PROTECTION AGENCY, OFFICE OF ENVIRONMENTAL JUSTICE, PLAN EJ 2014, *available at* http://www.epa.gov/compliance/ej/resources/policy/plan-ej-2014/plan-ej-2011-09.pdf (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT). Plan EJ 2014 was created with the 20th anniversary of President Clinton's Executive Order 12898 in mind. *Id.* at i. Executive Order 12898, promulgated in 1994, requires that:

> To the greatest extent practicable and permitted by law, . . . each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions, the District of Columbia, the Commonwealth of Puerto Rico, and the Commonwealth of the Marian islands. Exec. Order No. 12898, 59 Fed. Reg. 9629 (Feb. 26, 1994).

168.   *See* PLAN EJ 2014, *supra* note 167, at i (stating the goal of Plan EJ: "to more effectively protect human health and the environment for overburdened populations by developing and implementing guidance on incorporating environmental justice into EPA's rulemaking process").

169.   *Id.* at 1, n. 1.

170.   *See* Fineman, *Beyond Identities*, *supra* note 25, at 1755 (arguing that "the variations in social location that are produced as the result of institutional practices and operations . . . becomes the most significant focus for

a fashion that makes relations of power and politics hard to see. In the Plan EJ passage, the disproportionate environmental harms attributed to minority, low-income, and indigenous communities are attributed to their greater vulnerability. This vulnerability is in turn attributed to the communities themselves, which have somehow accumulated "negative conditions" and lack "positive conditions." In contrast, environmental justice advocates, using an anti-subordination lens to approach ecological vulnerability, have called attention to the role of social injustices, especially racism and poverty, in determining who and to what extent people suffer from environmental harms.[171] Without a robust commitment to anti-subordination, even a document claiming an explicit "justice" orientation, like Plan EJ, may use the language of vulnerability so as to avoid talking about the role of political and social subordination in making populations "vulnerable" in the first place.[172]

This lack of attention to the role of power and privilege also has the capacity to influence the path of scientific research and technical expertise. For example, at a 2010 symposium entitled "Strengthening Environmental Justice Research and Decision Making: A Symposium on the Science of Disproportionate Environmental Health Impacts," participants, including EPA officials, scientists, and representatives of community-based organizations, discussed EPA's role in collecting and disseminating research on environmental health.[173]

a vulnerability analysis.").

171.   *See* LUKE W. COLE & SHEILA R. FOSTER, FROM THE GROUND UP: ENVIRONMENTAL RACISM AND THE RISE OF THE ENVIRONMENTAL JUSTICE MOVEMENT 21 (2000) (noting that civil rights activists brought to the environmental justice movement "a perspective that recognized that the disproportionate impact of environmental hazards was not random or the result of 'neutral' decisions but a product of the same and social and economic structure which had produced de jure and de facto segregation and other racial oppression").

172.   *See* Tom E.R.B. West, *Environmental Justice and Internationl Climate Change Legislation: A Cosmopolitan Perspective*, 25 GEO. INT'L ENVTL. REV. 129, 151 ("Climate change legislation has begun to address the former oversight through differentiated emission reduction targets in the Kyoto Protocol and acknowledgement of the special situations of certain vulnerable countries . . . .").

173.   *See Strengthening Environmental Justice Research and Decision Making: A Symposium on the Science of Disproportionate Environmental Health Impacts (Disproportionate Impacts Symposium)*, U.S.

Dayne Payne-Sturges, a co-organizer of the symposium, later reflected that "[s]ymposium participants were concerned that the EPA had not prioritized research on vulnerability, particularly the social and cultural aspects of it in the agency's research programs."[174] Payne-Sturges further explains:

> EPA-supported research, assessments, and solutions are rarely aimed at why these hazards are there in the first place, at who and what systems create and maintain the observed racial/ethnic and class disparities in exposures or environmental degradation, and at what can be done to prevent these hazards from impacting the community. Focusing research and policies on the processes that lead to environmental inequities and then on the measures needed to alter these unjust processes (as opposed to focusing on single cases of environmental inequality) will likely lead to the greatest social and environmental improvements.[175]

The EPA is far from unique in employing the language of vulnerability to obscure the political and social roots of that vulnerability. The field of public health has been criticized for, as one scholar puts it, employing "a subtle assumption that the genesis of vulnerability and suffering is the individual and his or her choices."[176] In the public health literature, "vulnerability" is joined to other key words that obscure power, such as "risk" and "disparities."[177] Identifying the problem of "vulnerability" as the

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ENVIRONMENTAL PROTECTION AGENCY, http://www.epa.gov/ncer/events/news/2010/03_17_10_calendar.html (last visited Nov. 11, 2014) (advertising the symposium and topics scheduled to be discussed) (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY CLIMATE, AND THE ENVIRONMENT).

174. Devon Payne-Sturges, *Humanizing Science at the U.S. Environmental Protection Agency*, 101 AM. J. PUB. HEALTH SUPPLEMENT 1, at S8, S9 (2011).

175. *Id.* at S10.

176. Seth M. Holmes, *Structural Vulnerability and Hierarchies of Ethnicity and Citizenship on the Farm*, 30 MEDICAL ANTHROPOLOGY: CROSS-CULTURAL STUDIES IN HEALTH AND ILLNESS 425, 447 (2011).

177. *See* Dayna B. Matthew, *Disastrous Disasters: Restoring Civil Rights Protection for the Victims of the State in Natural Disasters*, 2 J. HEALTH &

presence of "disparities" or "disproportionality" tends to call attention away from political and social injustices, as well as from how equality is being defined.[178] Looking for "risk factors" that lead to disparities or disproportionality makes it easy to focus on characteristics of the individual or population under study, and not the institutional dynamics that contribute to those characteristics.[179] Moreover, even where critics have shifted the public health discussion in a structural direction toward social institutions and dynamics of injustice such as racial discrimination (the so-called "upstream" factors contributing to vulnerability), some worry that researchers may fail to take account of "preservation through transformation"—discrimination's capacity to change form over time.[180] Given the existing bias in policy analysis toward foregrounding the individual, "vulnerability" and its cognates are far too easily coopted.

Thus, while Fineman may be right that a vulnerability analysis should call attention to the institutional conditions that construct that vulnerability, conventionally it is capable of doing just the opposite. Vulnerability, in policy analysis, is commonly treated as a fixed characteristic of the population or individual in question, rather than as the outcome of social and political relations.[181] By obscuring the political and institutional

BIOMEDICAL L. 213, 227 (2006) (discussing the application of Title VI of the Civil Right Act of 1964 to public health disparities resulting from national disasters).

178.   *See id.* at 248 ("The impact of racial and economic injustice is magnified when the very governmental authority charged with protecting and promoting public health, instead takes the occasion of a devastating hurricane, flood, earthquake, tornado or storm that is completely out of its control, to impose differential policies and procedures that are fully within its control.").

179.   *See id.* (highlighting more pervasive and universal policies of injustice).

180.   *See e.g.*, Lisa C. Ikemoto, *In the Shadow of Race: Women of Color in Health Disparities Policy*, 39 U.C. DAVIS L.REV. 1023, 1056 (2006) (commenting on a new "structural" approach to the study of health care disparities). Ikemoto suggests that the enthusiasm for identifying and attacking racial discrimination in the provision of health care and the training of health care workers, although it might do much good, "might not prevent the underlying ideologies from reconstituting into new practices and standards that would, in turn, undermine the gains made." *Id.* Ikemoto calls for a "critical cultural inquiry" that would explicitly focus on power relations and draw on the work of critical theorists. *See id.*

181.   *See* Fineman, *Beyond Identities*, *supra* note 25, at 1750

components of vulnerability, conventional policy analysis has the potential to portray domination as difference, and to hide the problem of unequal distribution of benefits and burdens within a universalist framework.[182] Recognition of vulnerability must therefore be supplemented with an explicit commitment to the anti-subordination principle, which requires us to look for power and injustice even in our language and our frameworks for research and policy.[183]

Feminist theorist Martha Minow saw a similar problem with the language of "difference" then pervading antidiscrimination jurisprudence.[184] Identifying five "unstated assumptions" in Supreme Court jurisprudence about the nature of difference, Minow argued:

> Each of these assumptions bears the imprint of an historical association between power and the production of knowledge about the world. Thus, the characteristics and experiences of those people who have had power to construct legal rules and social arrangements also influence and reflect the dominant cultural expressions of what in different and what is normal.[185]

("Certain characteristics or identity markers associated with historic disadvantage also sometimes qualify for inclusion within vulnerable population status.").

     182.   *See id.* ("This targeted-group approach to vulnerability ignores its universality and inappropriately constructs relationships of difference and distance between individuals and groups within society.").

     183.   *See* Larry A. DiMatteo, *Reason and Context: A Dual Track Theory*, 109 PENN. ST. L. REV. 397, 412 (noting the legal realist idea that human knowledge and experience should influence analysis of law).

     184.   *See generally* Martha Minow, *Foreword: Justice Engendered,* 101 HARV. L. REV. 10 (1987) (reviewing the 1986 Supreme Court Term and the issues of difference that arose).

     185.   *Id.* at 33. The five assumptions Minow found in Supreme Court jurisprudence and subjected to critical scrutiny were: (1) that difference is intrinsic, not relational; (2) that the norm against which "difference" is judged may be left implicit and unstated; (3) that the observer can see without a perspective; (4) that other perspectives are irrelevant; and (5) that the status quo is natural, uncoerced, and good. *Id.* at 34–58 (challenging each assumption in detail).

In her critical analysis of these hidden assumptions, Minow acknowledged a debt to feminists, who have painstakingly sought to uncover the unstated assumptions underlying patriarchal power.[186] Minow concluded that making "audible, in official arenas, the struggles over which version of reality will secure power" was the only way to do justice in a democracy.[187]

A commitment to anti-subordination can provide a similar rigorous check on bias toward power within the framework of ecological vulnerability. A model of how this can be done can be seen in the field of social epidemiology, where Nancy Krieger champions an "eco-social" approach to the study of human health. Krieger argues that this approach to scientific research "can begin to elucidate population patterns of health, disease and well-being as biological expressions of social relations, and can likewise begin to see how social relations influence our most basic understandings of biology and our social constructions of disease—thereby potentially generating new knowledge and new grounds for action."[188] In her view, a central construct of the eco-social approach is "embodiment," "a concept referring to how we literally incorporate, biologically, the material and social world in which we live, from conception to death; a corollary is that no aspect of our biology can be understood absent knowledge of history and individual and societal ways of living."[189] Krieger's notion of embodiment captures both the indivisibility principle and the anti-subordination principle, and usefully turns each upon the other.

This subsection has championed two complementary first principles for taking ecological vulnerability into account in legal

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186.   *See id.* at 61 ("Leading feminists have contributed incisive critiques of the unstated assumptions behind political theory, law, bureaucracy, science, and social science. Their work exposes the dominance in field after field of conceptions of human nature that take a male as the reference point and treat women as "other," "different," "deviant," "exceptional," or baffling. Feminist work has thus named the power of naming and has challenged both the use of male measures and the assumption that women fail by them.").

187.   *Id.* at 95. For an even more radical call for multiple voices to be heard in struggles over how to define communities and set community rules, *see generally* BRUNO LATOUR, POLITICS OF NATURE: HOW TO BRING THE SCIENCES INTO DEMOCRACY (Catherine Porter trans., 2004).

188.   Nancy Krieger, *Theories for Social Epidemiology in the 21st Century: An Ecosocial Perspective*, 30 INT'L J. OF EPIDEMIOLOGY 668, 672 (2001).

189.   *Id.*

and political theory. On the one hand, theories of social justice are incomplete without the recognition that the subject of justice is embedded within complex relations with the trans-human and non-human, vulnerable across the life span and not fully separate from the "environment" that sustains all life on the planet. On the other hand, without a commitment to anti-subordination, vulnerability theory threatens to become just another way to foster injustice. Dual commitments to indivisibility and anti-subordination will help ensure the integrity of the ecological vulnerability framework.

C. Existing Models for Ecological Vulnerability

Although a complete account is beyond the scope of this Article, I want to end by acknowledging that the kind of intellectual, political, and legal projects suggested by the ecological vulnerability framework already exist.

One intellectual project compatible with ecological vulnerability is Julian Agyeman's concept of "just sustainability."[190] Just sustainability embraces just social relations among persons, and sustainable relations between humans and the nonhuman world (in its spatial dimension, preserving the web of life across the planet; and in its temporal dimension, preserving the web not just for a single generation, but for future generations). Agyeman describes it as "the need to ensure a better quality of life for all, now and into the future, in a just and equitable manner, whilst living within the limits of supporting ecosystems."[191] In accordance with the indivisibility principle and the anti-subordination principle, Agyeman's understanding of just sustainability links "the richer countries and the not-for-profits of the global North that want to discuss a

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190.   *See e.g.*, JULIAN AGYEMAN, INTRODUCING JUST SUSTAINABILITIES: POLICY, PLANNING, AND PRACTICE 4–5 (2013) (arguing that social needs and welfare need to be included in the just sustainability theory); Julian Agyeman, *Toward a "Just" Sustainability?*, 22 CONTINUUM: JOURNAL OF MEDIA AND CULTURAL STUDIES 751, 755 (2010) (listing the four areas of concern for the Just Sustainability Paradigmas "(1) Quality of Life; (2) Present *and* Future Generations; (3) Justice and Equity; [and] (4) Living within Ecosystem Limits").

191.   Agyeman, *Toward a "Just" Sustainability?*, *supra* note 190, at 755 (citing JUST SUSTAINABILITIES: DEVELOPMENT IN AN UNEQUAL WORLD 5 (Julian Agyeman et al. eds., 2003)).

'green' agenda of environmental protection, biodiversity, and the protection of the ozone layer" with "those poorer ones in the South that are proponents of a 'brown' agenda of poverty alleviation, infrastructural development, health and education."[192]

The best example of an existing political project consonant with ecological vulnerability is the environmental justice movement. In 1991, organizers from the civil rights movement, the "anti-toxics" movement, indigenous nations, and the farmworkers' movement came together at the first People of Color Environmental Leadership Summit in Washington, D.C. and agreed upon seventeen "principles of environmental justice."[193] The preamble to these principles states:

> We, the people of color, gathered together at this multinational People of Color Environmental Leadership Summit, to begin to build a national and international movement of all peoples of color to fight the destruction and taking of our lands and communities, do hereby re-establish our spiritual interdependence to the sacredness of our Mother Earth; to respect and celebrate each of our cultures, languages and beliefs about the natural world and our roles in healing ourselves; to ensure environmental justice; to promote economic alternatives which would contribute to the development of environmentally safe livelihoods; and, to secure our political, economic and cultural liberation that has been denied for over 500 years of colonization and oppression, resulting in the poisoning of our communities and land and the

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192.   *Id.* at 753.

193.   *See* Dorceta E. Taylor, *The Rise of the Environmental Justice Paradigm: Injustice Framing and the Social Construction of Environmental Discourses,* 43 AM. BEHAVIORAL SCIENTIST 508, 539–42 (2000) (outlining and analyzing the Principles). For a general introduction to the U.S. environmental justice movement, see COLE & FOSTER, *supra* note 171. For an introduction to the global environmental justice movement, see RAMACHANDRA GUHA, ENVIRONMENTALISM: A GLOBAL HISTORY (2000).

genocide of our peoples, do affirm and adopt these Principles of Environmental Justice.[194]

The principles expressed by the environmental justice advocates who gathered in Washington, D.C. in 1991 are fully in line with ecological vulnerability: care for the earth and for social justice simultaneously; an understanding that human life is inextricably intertwined with life and non-life, human and not, at many levels of scale; an understanding of political obligation as necessarily founded on obligations to the web of life that sustains the subjects of politics; and a commitment to critique, understanding that objectivity and neutrality are useful ideals but that we live in a non-ideal world shaped by domination.

Finally, something quite similar to the framework I have named ecological vulnerability has already reached law and public policy in South America under the name of *buen vivir*, or *vivir bien* (literally, "the good life" or "living well"). Tracing the origins of *buen vivir,* Eduardo Gudynas identifies one of its sources as a critique of the practices and language of international development in the global South.[195] Early uses of *buen vivir,* Gudynas explains, "highlighted the shortcomings and negative impacts of development projects implemented by governments and multilateral development banks in Latin America in the last decades."[196] Such projects, such as dams, unfortunately often led to disappointing results in terms of poverty reduction, while at the same time creating environmental

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194. *Principles of Economic Justice, Preamble: 1991 Leadership Summit,* ENVIRONMENTAL JUSTICE/ENVIRONMENTAL RACISM, *available at* http://www.ejnet.org/ej/principles.html (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT).

195. *See* Eduardo Gudynas, *Buen Vivir: Today's Tomorrow*, 54 DEVELOPMENT 441, 442 (2011) (explaining the origins of the *buen vivir* movement in South America).

196. *Id.*; *see generally* Eduardo Gudynas & Alberto Acosta, *La renovación de la critica desarrollo y el buen vivir como alternativa*, J. SUSTAINABILITY EDUC. (Mar. 19, 2012) http://www.jsedimensions.org/wordpress/content/la-renovacion-de-la-critica-al-desarrollo-y-el-buen-vivir-como-alternativa_2012_03/ (arguing that the ideals of *buen vivir* and its indigenous roots has led to the emergence of the "new left") (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT).

havoc and distress in the communities they overshadowed.[197] More generally, the proponents of *buen vivir* are critical of resource extraction as the preferred development path for poor nations, for both social and environmental reasons.[198]

According to Gudynas, the second origin point of *buen vivir* is positive rather than negative: Latin American indigenous philosophies that offer a radical alternative to the mindset and the practices of capitalism.[199] As Gudynas notes, one of the best-known sources of *buen vivir* is "the Ecuadorian concept of *sumak kawsay*, the *kichwa* [Quechua] wording for a fullness life in a community, together with other persons and Nature. More or less at the same time that *sumak kawsay* became spoken about in Ecuador in Bolivia a similar [A]ymara concept of *suma qamaña* emerged."[200] Another indigenous philosophy from the Guaraní people involves "ideas of the harmonious living (*ñandereko*), good

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197.   See MᴄNᴇɪʟʟ, *supra* note 4, at 181–82 (discussing the environmental and social harms of dam-building projects in the twentieth century). McNeill comments, "Dams displaced millions without compensation, perhaps 40 million over the course of the century, three-quarters of them in India and China." *Id.* at 182.

198.   *See, e.g.*, Eduardo Gudynas, *Extracciones, Extractivismos y Extrahecciones: Un Marco Conceptual sobre la Apropiacion de Recursos Naturales*, 18 Oʙsᴇʀᴠᴀᴛᴏʀɪᴏ ᴅᴇʟ Dᴇsᴀʀʀᴏʟʟᴏ 1, 3 (2013), *available at* http://www.extractivismo.com/documentos/GudynasApropiacionExtractivismoE xtrahecccionesOdeD2013.pdf (defining "extractivismo" as a type of natural resource extraction characterized by large volume or high intensity that is oriented toward foreign export of unprocessed or barely processed materials) (on file with the Wᴀsʜɪɴɢᴛᴏɴ ᴀɴᴅ Lᴇᴇ Jᴏᴜʀɴᴀʟ ᴏf Eɴᴇʀɢʏ, Cʟɪᴍᴀᴛᴇ, ᴀɴᴅ ᴛʜᴇ Eɴᴠɪʀᴏɴᴍᴇɴᴛ); Rᴏʙᴇʀᴛs & Pᴀʀᴋs, *supra* note 150, at 112 (using the term "extractive state" to describe "nations that are heavily dependent upon exports of raw and barely processed materials (mining and lumbering resources as well as ranching and plantation agriculture)" and noting that such states are also "notorious for their feeble domestic institutions"). Some scholars have nicknamed the combination of resource extraction and weak civil society institutions as "the resource curse." *See, e.g.*, Dustin N. Sharp, *Requiem for a Pipedream: Oil, the World Bank, and the Need for Human Rights Assessments*, 25 Eᴍᴏʀʏ Iɴᴛ'ʟ L. Rᴇᴠ. 379, 379 (2011) ("More often than not, the revenues that should in theory be a great boon to development are in practice associated with disastrous human rights fallout as living standards actually decrease and governance indicators worsen, a phenomenon known as the 'resource curse'").

199.   *See* Gudynas, *Buen Vivir*, *supra* note 195, at 442 (discussing the indigenous origins of the *buen vivir* movement).

200.   *Id.* at 442–43

life (*teko kavi*), the land without evil (*ivi maraei*) and the path to the noble life (*qhapaj ñan*)."[201]

Arising from these dual origins, Gudynas argues, *buen vivir* has become the umbrella term for an ongoing multicultural dialogue around a variety of themes. One of these themes is "a reaction against the conventional domination of utilitarian values, particularly expressed in the reductionism of life to economic values and the subsequent commoditization of almost everything."[202] Another theme of *buen vivir* is the indivisibility principle, as Gudynas explains:

> *Buen Vivir* promotes the dissolution of the Society-Nature dualism. Nature becomes part of the social world, and political communities could extend in some cases to the non-human. These include, as examples, the proposals of the biocentric environmental perspective, but also indigenous positions that recognize that the non-human (either animals, plants, ecosystems or spirits) have will and feelings. Thus, the polis is expanded, and the concept of citizenship is widened to include these other actors within environmental settings.[203]

Buen vivir is not only an influential ideology in South America; in some nations it has been written into law. For example, in the most recent version of the Bolivian Constitution (approved in 2009), the term "*Vivir Bien,*" along with its Aymara and Guaraní cognates, is included in Title 1, Chapter 2, Article 8, the section devoted to the ethical and moral principles describing the values, ends, and objectives of the state.[204] Moreover, the section links these terms to principles more familiar in the West, such as unity, equality, dignity, inclusion, equal opportunity,

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201.   *See id*. at 443 (describing *buen vivir* as "[a] plural endeavor").
202.   *Id.* at 445.
203.   *Id.*
204.   República del Bolivia, Constitución de 2009, Primera Parte, Título I, Capítulo Segundo, Artículo 8, (Bol.) *available at* http://pdba.georgetown.edu/Constitutions/Bolivia/bolivia09.html [Bolivian Constitution] (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT).

freedom, solidarity, reciprocity, and social justice.[205] This structure can be understood as incorporating the anti-subordination principle as well as the indivisibility principle into Bolivian constitutional law.

Statutory law has followed this constitutional lead. For example, in October of 2012 the legislative assembly of Bolivia approved a new law, the Act Concerning the Term "Madre Tierra" and Integrated Development for Vivir Bien ("the Madre Tierra Law").[206] Article 1 of the statute introduces the term "integrated development." Integrated development, according to the statute, is to be undertaken in harmony and equilibrium with Mother Earth with the goals of fostering *Vivir Bien,* guaranteeing the regenerative capacity of the components and systems of life, and recovering and strengthening local and traditional knowledge.[207] The Madre Tierra Law defines "Mother Earth" in this way:

> Mother Earth is a living, dynamic system in conformance with the indivisible community of all living systems and living beings, interrelated, interdependent and complementary, sharing a common destiny. Mother Earth is considered sacred; it feeds and is a home that contains, sustains and reproduces all living beings, ecosystems, biodiversity, organic societies and the individuals that compose them.[208]

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205.   *Id.*

206.   Ley Marco De La Madre Tierra y Desarrollo Integral Para Vivir Bien [Mother Earth and Integral Development for Living Well Framework Law], Law No. 300, 15 de Octubre de 2012, art. 1 (Bol.) [hereinafter Madre Tierra Law].

207.   *See* Madre Tierra Law, art. 1, supra note 210 ("La presente Ley tiene por objecto establecer la vision y los fundamentos del desarrollo integral en armonía y equilibrio con la Madre Tierra para Vivir Bien, garantizando la continuidad de la capacidad de regeneración de los componentes y sistemas de vida de la Madre Tierra, recuperando y fortalenciendo los saberes locales y conocimientos ancestrales").

208.   Madre Tierra Law, art. 5, supra note 210 (Madre Tierra "es el Sistema viviente dinámico conformado por la comunidad indivisible de todos los sistemas de vida y los seres vivos, interrelacionados, interdependientes y complementarios, que comparten un destino común. La Madre Tierra es considerada sagrada; alimenta y es el hogar que contiene, sostiene y reproduce a todos los seres vivos, los ecosistemas, la biodiversidad, las sociedades orgánicas y los individuos que la componen.").

As two commentators explain,[209] the law—treating "integrated development as inextricably intertwined with el *vivir bien* (defined as synonymous with the indigenous terms *sumaj kamaňa*, *sumaj kausay*, and *yaiko kavi pave*)—takes note of the poverty that afflicts many Bolivians, and declares it the obligation of the state to create the material conditions to guarantee self-determination. The law then sets out ten "objectives" and eleven "bases and orientations of integrated development." Among these are norms concerning food security; protections for biodiversity and the country's "genetic patrimony" (*patrimonio genético*) including the goal of moving away from reliance on genetically modified organisms; special procedural protections for forest areas being considered for development; and goals concerning sustainable energy, water consumption, and hazardous waste production.[210] Finally, the law creates new administrative structures to promote these goals, including a national body with authority, in conjunction with the Central Bank of Bolivia, to promote mechanisms aimed at preventing and adapting to climate change.[211]

Like the Bolivian Constitution, the Ecuadorian Constitution of 2008 incorporates the concept of *buen vivir*.[212] Title II, Chapter 2, entitled "Rights of *Buen Vivir*," articulates a series of socioeconomic rights, including rights to water and food (section 1), rights to freedom of communication and conscience (section 3), and the right to health (section 7). Article 14 of this chapter includes among these rights of *buen vivir* the right of the population to live in an environment that is clean and in ecological balance, which will in turn guarantee sustainability

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209.   *See* René Orellana Halkyer & Diego Pacheco Balanza, La Ley Marco de la Madre Tierra y Desarrollo Integral para Vivir Bien, 479 AMERICA LATINA EN MOVIMIENTO 22 (2012).

210.   *Id.*

211.   *Id.*

212.   For a detailed review of the incorporation of *buen vivir* in the 2008 Ecuadorian Constitution, see Alberto Acosta, "El Buen Vivir en el camino del post-desarrollo: Una lectura desde la Constitución de Montecristi," Friedrich Ehberg Stiftung Policy Paper 9 (October 2010), *available at* http://cadtm.org/IMG/pdf/El_Buen_Vivir_en_el_camino_del_post-desarrollo-_Una_lectura_desde_la_Constitucion_de_Montecristi.pdf (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT).

and *buen vivir/sumak kawsay.* [213] Title VI, Chapter 1, Article 275 declares that, as a matter of general principles, economic development shall follow principles of *buen vivir/sumak kawsay,*[214] and that *buen vivir* requires individuals, communities, peoples and nationalities to exercise their rights and responsibilities within a framework of multiculturalism, respect for diversity, and harmonious coexistence with nature.[215]

Going further, the Ecuadorian Constitution also sets out in Title II, Chapter 7 a series of rights belonging to nature itself.[216] For example, Article 71 of this chapter declares that Nature or *Pachamama,* as the place where life is reproduced and created, has the right to have its existence respected with integrity, and the right to the maintenance and regeneration of its vital cycles, structure, functions and evolutionary processes.[217]

Like the ideal of "just sustainability," the ideal of *buen vivir* incorporates the indivisibility principle. It treats human and non-human systems as inextricably intertwined and inter-dependent, and rejects the conventional view that humans can and should dominate Nature. The Bolivian and Ecuadorian

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213.   *See* República del Ecuador, Constituciones de 2008 [Constitution], Título II, Capítulo Segundo, Art. 14 (Ecuador) ("Se reconoce el derecho de la población a vivir en un ambiente sano y ecológicamente equilibrado, que garantice la sostenibilidad y el buen vivir, sumak kawsay."), *available   at* http://pdba.georgetown.edu/Constitutions/Ecuador/ecuador08.html#mozTocId70 5782 (last updated July 11, 2011) (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT).

214.   *See* República del Ecuador, Constituciones de 2008 [Constitution], Título VI, Capítulo Primero, Art. 275 (Ecuador) ("El régimen de desarrollo es el conjunto organizado, sostenible y dinámico de los sistemas económicos, políticos, socio-culturales y ambientales, que garantizan la realización del buen vivir, del sumak kawsay.").

215.   *See id.* ("El buen vivir requerirá que las personas, comunidades, pueblos y nacionalidades gocen efectivamente de sus derechos, y ejerzan responsabilidades en el marco de la interculturalidad, del respeto a sus diversidades, y de la convivencia armónica con la naturaleza.").

216.   *See* República del Ecuador, Constituciones de 2008 [Constitution], Título II, Capítulo Séptimo, "Derechos de la naturaleza" [rights of nature] (Ecuador).

217.   *See* República del Ecuador, Constituciones de 2008 [Constitution], Título II, Capítulo Séptimo, Art. 71 (Ecuador) ("La naturaleza o Pacha Mama, donde se reproduce y realiza la vida, tiene derecho a que se respete integralmente su existencia y el mantenimiento y regeneración de sus ciclos vitales, estructura, funciones y procesos evolutivos.")

Constitutions and the Madre Tierra Law also reject the view that economic practices and institutions like markets are properly outside politics and that development comes first and redistribution later. At the same time, these constitutional and statutory texts incorporate the anti-subordination principle. They symbolically challenge the long domination of indigenous nations with their use of indigenous as well as Spanish terms for harmonious living, and the inclusion of multiple human rights, including socioeconomic rights, makes the commitment material as well as symbolic. As ecological vulnerability suggests, *buen vivir,* as incorporated in these constitutional and statutory doctrines, begins to rethink legal theory and legal practices and institutions in ways that foster the intertwining of social justice and economic sustainability.

IV. Conclusion

In a recent essay, Brian Gilmore examines recent calls for an international "degrowth" movement—a campaign for deliberate economic contraction in response to climate change.[218] Gilmore first takes note of the tension between rich and poor nations over climate mitigation and adaptation projects:

> How can the historically developed nations of high economic development now convince these developing nations that they should halt or significantly alter their economic development and growth and not seek to change the standard of living in their countries for the masses of people for the sake of sustaining a world population that has heretofore denied them participation? It is perhaps an impossible suggestion.[219]

As Gilmore goes on to observe, however, the tension between, on the one hand, the need to abandon economic "business as usual" for the sake of the human race as a whole,

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218.   *See generally*, Gilmore, *supra* note 151. In his essay, Gilmore refers to Serge Latouche's 2009 book, *Farewell to Growth*, which advocates for "de-growth" but also calls for resistance to bias. *Id.* at 1286.

219.   *Id.* at 1284.

and, on the other hand, the need to make recompense for the continuing injuries of slavery, colonialism, imperialism and discrimination is not only an international issue.[220] Gilmore notes that African Americans—who are still, as a population, near the bottom of many U.S. measures of economic and social wellbeing— have for years been promised "equal opportunity."[221] As the world now possibly turns toward economic contraction, Gilmore asks these questions:

> What will "degrowth" mean for black Americans, specifically beyond the individual choice or collective choice?
>
> Will it mean equality or will it mean a transition to a "degrowth" society, where the same enduring inequities persist?
>
> How will the transition from an unequal "growth" society be made and how will it be implemented?
>
> Are past injustices, such as slavery and "Jim Crow" laws, to be forgotten or dismissed for all times in light of "degrowth"?
>
> Is there any need to address these past injustices considering the goals of "degrowth"?
>
> What will guarantee more equality as the transition or semi-transition occurs?
>
> And will the implementation of "degrowth" models imperil personal freedoms of black Americans?[222]

Fineman's theory of vulnerability raises these same questions. This Article has argued that vulnerability theory offers

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220.   *See id.* at 1283–85 (applying the degrowth tensions to the United States).

221.   *See id.* at 1288–93 (discussing the history of slavery and measures of present-day economic inequality, including the racialized wealth gap).

222.   *Id.* at 1293.

a way into rethinking political obligation in the age of the Anthropocene, by situating the human social contract within a "natural contract" that is trans-human but also constitutive of the human. Ecological vulnerability brings into political theory recognition of the full extent of human "fragile materiality," and underscores the fact of the indivisibility of human flourishing and ecological balance.

At the same time, vulnerability theory alone is insufficient to completely fulfill the promise of this mutual engagement between critical legal theory and environmental theory. Vulnerability is a universal condition of being human, but it does not burden all equally. Fineman's notion of vulnerability rightly calls attention to the social institutions that mediate vulnerability and support resilience. Yet, attention to universal vulnerability can too easily become a means of ignoring specific injustices. A robust commitment to anti-subordination as well as indivisibility is required to truly incorporate social justice and environmental care. Together, the two principles can begin to assist us in responding to the challenges of the Anthropocene.