

# Sociological Theory After the End of Nature

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## Abstract

Anthropogenic climate change poses a fundamental challenge to the cultural beliefs and social structure of global social order. However, the social sciences treat the natural world as a passive backdrop in which the human project unfolds, and focus primarily on the relation between social facts. In a world where human activities are being manifestly impacted by a continuously shifting climate, it is no longer adequate to only look to human social interactions to gain an understanding of how social order is constituted and changed. This realization has led a number of scholars across the range of social sciences to identify a need to move beyond anthropocentric social sciences. This essay provides an overview of the major efforts to create a social science that integrates social and natural facts within the field of sociology. Three areas of foundational research in this area are discussed, including the reinterpretation of sociological classics, the development of constructed society/nature hybrids, and the creation of linked society–natural systems models. Examples of empirical research demonstrating these approaches are then provided. The essay concludes with a survey of ongoing sociological theory projects on this topic.

## INTRODUCTION

Over 25 years ago in a Congressional Hearing, noted climatologist James Hansen testified that “Global warming has reached a level such that we can ascribe with a high degree of confidence a cause and effect relationship between the greenhouse effect and the observed warming (Hansen, 1988, p. 3).” This testimony marks the public declaration of the scientific community that humans were significantly altering the global climate through the emissions of CO<sub>2</sub>. The following year, Bill McKibben published a book titled *The End of Nature*. In this book, he argued that as a result of climate change, the idea of nature as something independent of and separate from human society was no longer viable. As a result of this transformation he argues that: “We are no longer able to think of ourselves as a species tossed

about by larger forces—now we are those larger forces” (McKibben, 2006, p. xviii).

Anthropogenic climate change poses a fundamental challenge to the cultural beliefs and social structure of global social order. The advent of global climate change is a fundamental transformation in both human and natural history. The impact of human society has reached such an extent that it is modifying the fundamental geochemical cycles on the planet. This will result in a continuously changing climate for several millennia (Anderson, 2012; Rockström *et al.*, 2009). Because of this impact, the natural science community is seriously debating whether we have entered a new geological period, known as the Anthropocene, marking the role of human activity as a significant force in the shaping of the planet (Crutzen & Stoermer, 2000). Regardless of the outcome of the official geological period certification process, it is clear that human society has entered into a new era, in which “natural forces and human forces became intertwined, so that the fate of one determines the fate of the other” (Zalesiewicz, Williams, Steffen, & Crutzen, 2010, p. 2231).

While human society has always influenced the shape of the natural world, the current scale and scope of the human influence on natural processes is of an entirely new dimension. The historical development of world built around technological industrialism (either capitalism or socialism) has reached the limits to growth regarding the atmosphere’s capacity to absorb our carbon emissions. Thus, the material conditions of human existence have fundamentally changed, and to live within these limits requires massive social and economic changes. For example, Anderson and Bows (2012, p. 640) convincingly argue that continued economic growth is no longer compatible with avoiding extremely dangerous and perhaps catastrophic climate change. However, the existing social institutions, culture, and ways of life built around global capitalism and consumption have yet to respond to this situation. Instead, our institutions remain frozen in the existing patterns of action, as CO<sub>2</sub> levels continue to increase (Leahy, Bowden, & Threadgold, 2010, pp. 863–864). We are confronted with a historical situation that has no parallel in human history. As a result, our cultural repertoire is unable to imagine, much less provide, responses that enable us to respond effectively to climate change. So the climate crisis manifests itself also as a cultural crisis (Hamilton, 2012, p. 728; Žizek, 2010, pp. 326–327). This is more than just an academic issue. Failure to respond effectively to climate change will engender a human catastrophe “on a scale similar to those associated with the great wars and the economic depression of the first half of the twentieth century (Stern, 2006, p. iv). Without an intellectual approach that can move us beyond the current cultural and political impasse, the fate of future generations is at risk.

IMPLICATIONS FOR SOCIAL THEORY

The current structure of academic disciplines contributes to this cultural crisis. The advent of climate change brings into question the viability of the nineteenth century disciplinary divisions between the natural and social sciences. For the most part, the social sciences have assumed that the natural world as a passive backdrop in which the human project unfolds, and focused on the relation between social facts. The natural sciences mirror this distinction, in focusing only on natural facts. However, climate change shows that this separation between the social and the natural worlds is obsolete. In a world where human activities are being manifestly impacted by a continuously shifting climate, it is no longer adequate to only look to human social interactions to gain an understanding of how social order is constituted and changed. As Hamilton (2013) explains: "So the advent of the Anthropocene shatters the self-contained world of social analysis that is the terrain of modern social science, and explains why those intellectuals who remain within it find it impossible to "analyze" the politics, sociology or philosophy of climate change in a way that is true to the science. They end up floundering in the old categories, unable to see that something epochal has occurred, a rupture on the scale of the Industrial Revolution or the emergence of civilization itself" (Hamilton, 2013). The nineteenth century divisions between the disciplines reflect a now nonexistent world in which this division might have made some sense. By continuing to replicate this distinction, the traditional academic divisions contribute to our society's inability to formulate a coherent intellectual approach to the Anthropocene. As such, these divisions mirror the anthropocentric cultural beliefs on which our existing social institutions are built. Thus, the current structure of the academic disciplines is deeply implicated as part of the cultural crisis engendered by climate change. Fredrick Jameson (1998, p. 50) defines this issue clearly: "It seems to be easier for us today to imagine the thoroughgoing deterioration of the earth and of nature than the breakdown of late capitalism, perhaps that is due to some weakness in our imaginations."

This realization has led a number of scholars across the range of social sciences to identify a need to move beyond anthropocentric social sciences (Urry, 2011, p. 8; Zizek, 2010, p. 333), and has resulted in a number of efforts to integrate social and natural science perspectives in their treatment of climate change. This emerging trend in the social sciences includes efforts in philosophy (Hamilton, 2012, p. 29, anthropology (Crate & Nuttall, 2009) history (Chakrabarty, 2009; Domanska, 2010; Fagan, 2000) and economics (Anderson & Bows, 2012, p. 640; Daly, 2005; Norgaard, 1994). This essay seeks to provide an overview of the major themes in this endeavor within the field of sociology.

## FOUNDATIONAL RESEARCH

Serious consideration of the dichotomy between sociology and the natural sciences began after the publication of the *Limits to Growth* (Meadows, Meadows, Randers, & Behrens, 1972). In a landmark article, Catton and Dunlap (1978) critiqued the field of sociology as being dominated by an anthropocentric approach, which they called the Human Exemptionalist Paradigm (HEP). This paradigm focused sociological inquiry on the analysis of social facts, and thus turned a blind eye toward the impacts and interactions of society with nature. To address this failure, Catton and Dunlap advocated the adoption of a New Environmental Paradigm (NEP), which saw human beings as “one species among the many that are independently involved in our biotic community that shape our social life” (Catton & Dunlap, 1978, p. 45). Accordingly, human society was seen as fully integrated into nature, and thus sociological research needed to shift its paradigm to integrate the biophysical environment as a key factor in understanding society. Building on this insight, there have been a number of intellectual attempts to develop a meta-theoretical perspective that would be capable of informing a nonanthropogenic social science.<sup>1</sup> At the risk of oversimplifying a complex literature, three approaches can be identified.

### REINTERPRETATION OF CLASSIC SOCIOLOGISTS

The first approach to transcend the society/nature divide is based on a reexamination of the writings of the classic sociologists to expand the focus of the discipline. These examinations show that the foundational theorists of sociology, especially Marx and Weber, integrated the natural world into their analysis of social order. Foster (1999) argues that Marx’s focus on the ecological metabolic exchange of material between society and nature linked human society to natural processes. The reexamination of the work of Weber focuses on the role that a society’s energy regime plays in the development of a society. The crux of Weber’s work is seen as centering between two types of social organization—the traditional–organic, based in human and animal labor, and the rational–inorganic, based in coal, marks a transition to a different form of social organization. Foster and Holleman (2012, p. 1636) argue that “it is the reliance on “inorganic” sources of energy (fossil fuels), along with energy-intensive and high resource consumption, that, for Weber, distinguishes the environmental context of industrial capitalism.” Accordingly,

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1. See Dunlap (2010) for an excellent overview of the historical development of environmental sociology and the nature/culture debate within sociology.

they maintain that Weber was one of the first sociologists of energy consumption. These reinterpretations have animated a large number of empirical analyses, which are discussed in the next section.

#### WORLD COMPOSED AS HYBRID NATURAL–CULTURAL OBJECTS

The second approach, primarily centered on the work of Bruno Latour, seeks to transcend the natural/social divide.<sup>2</sup> Arguing from a constructionist viewpoint, Latour maintains that there never has been any such thing as distinctly nature or social. Rather, he argues that “Nature is not a thing, a domain, a realm, an ontological territory. It is a way of organizing the division between appearances and reality, subjectivity and objectivity, history and immutability” (Latour, 2010, p. 476). Thus, nature is a human-composed object to account for resistance to innumerable interpretations.<sup>3</sup> So, in this perspective, the conceptions of “nature” and “society” are both part of a collective of linguistically created worlds that brings different realities into existence. Nature is thus composed of hybrid natural/social objects that are selected out of the flow of experience,<sup>4</sup> and are thus constituted as “objects” based on shared collective interpretations in human society. Latour argues that just as the climate scientists have composed a narrative that brings the workings of the global system into view, and thus relevance, so to do social scientists need to reformulate their approaches to extend this narrative to the social world. This approach animates an ongoing project headed by Latour.

#### INTEGRATED MODELS

The third area of sociological research that attempts to move beyond the society/nature divide takes the form of integrated models. This approach builds on an assumption that “nature and society are effectively coproduced through the reciprocal and symmetric interplay of the social and the physical (Goldman & Schurman, 2000, p. 575.).”<sup>5</sup> Underlying this approach is the use of evolutionary ecology instead of the uncritical use of systems ecology. In systems ecology, nature is seen as a biocybernetic entity that regulates itself (Hazelrigg, 1995, p. 295; Keulartz, 1998, p. 149). This view was commonly held by many ecologists throughout most of the 1960s and 1970s. However, the notion of community, and the supposed self-ordering properties of these

2. See Pollini (2013) for an excellent discussion and critique of Latour’s analysis.

3. See the discussion in footnote 5, Freudenberg, Frickel, and Gramling (1995, pp. 367–368) for a further discussion of this viewpoint.

4. Latour uses the term unrecruited objects.

5. Also see (Liu *et al.*, 2007, p. 1513).

communities was robustly critiqued in the 1980's (Schrader-Frechette & McCoy, 1994, pp. 111–112). As a result of this debate, systems ecology was supplanted in the 1980s and 1990s by evolutionary ecology. Evolutionary ecology centers on the idea that nature evolves through the generation, diffusion, and selective retention of random mutations. Nature is involved in a process of continual adaptation, which is not an active structuring process. Accordingly, evolutionary ecology rejects the idea that nature can be seen as a self-regulating mechanism. Rather, nature is seen as a chaotic system, in which chance and random events, as well as linear and nonlinear interactions govern (Hazelrigg, 1995, pp. 295–296; Zimmerman, 1994, p. 12). The uncritical use of a systems ecology perspective sets up an artificial dichotomy between human and nonhuman nature. From a systems ecology viewpoint, human activities are artifices that upset the balance of the self-regulating system of nature. This informs a particular treatment of nature as apart from man (Keulartz, 1998, p. 173, 1999). This dichotomy is not present if an evolutionary ecology perspective is adopted. Humans are seen as part of the complex interactions between living entities, and the apparent metaphysical dichotomy between human and nonhuman nature disappears into a consideration of specific interactions (Haila, 2000; Keulartz, 1998, p. 173).

Supporting this approach are a number of epistemological arguments. The two leading approaches are the co-constitution of nature and society pioneered by the work of Freudenberg, and a critical realist approach developed by Carolan. For Freudenberg, analytical distinctions are needed to distinguish between nature and culture so the interrelationships can be examined. This leads to specific comparative historical examinations of how society and nature have interacted with one another over time (Murphy & Dunlap, 2012). Carolan (2005) utilizes a critical realist perspective to argue for the use of empirical research that encompasses natural and social variables in an empirical research program.

None of these three approaches has achieved intellectual dominance within environmental sociology. Perhaps the sharpest debate is between the constructivist and empiricist approaches. A series of articles has noted several key issues in this debate, including major conceptual problems in the work of Latour (Pollini, 2013), and the alleged dissolution of the metaphysical nature/culture divide in the analysis of existing relationships between biophysical phenomena and social systems (Carolan, 2005; Dunlap, 2010; Haila, 2000). While this debate is ongoing, there has been some progress in sociological work that attempts to encompass natural and social interactions.

## EMERGING APPROACHES

Much of the intellectual work over the past 35 years since the publication of Catton and Dunlap (1978) does not advance into new theoretical territory uniting the natural and social sciences. Rather, this work marks a shift in research focus to the consideration of environmentally related phenomena using standard sociological approaches. This includes use of social movement theory to examine the environmental movement and the climate denial countermovement, attitudinal and demographic correlates of individual levels of environmental concern, and the social and cultural drivers of consumption. However, there are several different approaches that seek to integrate the social and natural sciences, which mark an important development in sociological theory. Within the field of environmental sociology, there are three major areas of inquiry that examine the relationship between social organization and environmental impacts.

- The role of social organization in the creation and expansion of climate change
- The impact of climate change on global inequality
- Integrative models.

### SOCIAL ORGANIZATION AND ANTHROPOGENIC CLIMATE CHANGE

Perhaps the most developed research area within environmental sociology is the role of social organization in the creation of anthropogenic climate change. This work links human social order to the creation of anthropogenic climate change through the coupling of political economy with a metabolic analysis of the flows of energy into society, and the production of greenhouse gases. The core of the political economy analysis is based on the model known as the Treadmill of Production (Schnaiberg, 1980). This approach maintains that the capitalist economy creates ecological problems through a self-reinforcing mechanism of ever more production and consumption. The logic of the treadmill of production is an ever-growing need for capital investment to generate goods for sale in the marketplace. The expansion of the economy drives the creation of economic wealth, and also the negative byproducts of the production process. Thus, the treadmill operates to maintain a positive rate of return on investments and externalizes the environmental costs of its activities. From an ecological perspective this process requires continuous and growing inputs of energy and material, and thus increased carbon emissions. Utilizing the industrial metabolism approach pioneered by Marx, researchers have empirically demonstrated the validity of the treadmill of production approach regarding carbon emissions (Clark & York, 2005). This research shows that the major social

driving forces of greenhouse gas emissions are economic and population growth, magnified by open trade policy and foreign investment in developing countries (Jorgensen & Burns, 2007; Jorgensen, Dick, & Mahutga, 2007; York, Rosa, & Dietz, 2003). Thus, this analysis links the disruption of the global climate system to the dynamics of the capitalist economic system, thus effectively linking social structure to nature.

#### THE IMPACT OF CLIMATE CHANGE ON GLOBAL INEQUALITY

A second major field of research on the interactions between climate change and social order focuses on how climate change accentuates global inequality and differentially impacts humans across the globe. This work combines the research on environmental justice (Brulle & Pellow, 2006) with world systems theory (Roberts & Parks, 2007). This analysis shows that the certain groups (especially women and minorities) and the citizens of less developed countries who have the least responsibility for historical carbon emissions will suffer the most from the initial adverse impacts of climate change. Specifically, drought caused by changing rainfall patterns, will severely impact much of the global south, especially in Africa, with adverse impacts on agricultural productivity and water availability. In addition, rising temperatures will allow increases of diseases transmitted by mosquitoes and other insects to expand their range. Taking all of these impacts together, climate change will further increase the extent of global poverty and inequality. This research has successfully joined the dynamics of the world economic system with the geographic analysis of climate change impacts to show how the “social” fact of global inequality will be impacted. Thus, it links the sources and outcomes of climate change to social processes, and moves toward a linkage between social facts and natural facts.

#### INTEGRATIVE MODELS

There are three types of integrative models. The first is the notion of coupled human and natural systems (Liu *et al.*, 2007). Primarily focused on local or regional analyses, these analyses consider both ecological and social variables to construct temporal or spatial models of these interactions. For example, one study looked at the interactions of the impacts of economic development on the natural environment, and how this then impacted tourism levels in Wisconsin (Liu *et al.*, 2007). A second form of integrative models follows Carolan (2005) and integrates both biophysical and social variable into its analysis. There have been a series of studies based on this approach that integrates weather conditions into analyses of levels of public opinion regarding climate change (Brulle, Carmichael, & Jenkins, 2012,



Hamilton & Keim, 2009). The third area of research focuses on the conjoint constitution of nature and society. In an important paper, Freudenberg, Frickel, and Gramling (1995) develop a historical analysis of how a physical object (a mountain in Wisconsin) was socially constructed, and how these constructions impacted social interactions in that geographic location. This analysis was extended to examine the interrelationships between energy development, environmental risk, and the politics of resource dependent communities (Freudenberg & Gramling, 2010).

### KEY ISSUES FOR FUTURE RESEARCH

How well this research addresses the changed circumstances that we face in the anthropocene is an open question. While the linked human and natural systems approach provides an analysis of how specific social and environmental processes interact, it accepts that the distinction between social and natural facts exists. So this form of analysis reproduces the nature/society split. While ecological modernization is certainly highly problematic, the treadmill of production approach is not without its own shortcomings. Fundamentally, this approach sees climate change as the result of the process of capital accumulation. So this form of analysis, while it does link social processes with their environmental impacts, it is not significantly different in its approach than the linked social and natural systems. The analysis of climate justice also follows the same form. However, this analysis links social processes—in the form of uneven development in a global capitalist economy to the production of carbon emissions, and the subsequent environmental effects. Thus, this takes the form of Global Capitalist Economic Development → Carbon Emissions → Unequal Impacts. So these three different approaches do not move beyond the nature/society divide. In addition, the analysis of the Treadmill of Production and Climate Justice are both highly reliant on the causal centrality of capitalism. The adequacy of this approach has been questioned. As Chakrabarty (2009, p. 212) notes “Capitalist globalization exists; so should its critiques. But these critiques do not give us an adequate hold on human history once we accept that the crisis of climate change is here with us and may exist as part of this planet for much longer than capitalism or long after capitalism has undergone many more historic mutations.” The final approach of conjoined constitution of nature and society can perhaps provide a robust approach to move beyond the nature/society split in sociological analysis. The case studies led by Freudenberg point in this direction. However, this approach is still in development. Recognizing the inadequacy of current approaches, Latour (2011, p. 11) has initiated a major research effort to bridge this gap.

However, it is not at all clear what this intellectual approach contributes to sociological theory.

However, Latour is not alone in recognizing the inadequacy of the social sciences in the face of global climate change. The natural science community has engaged in a long-term effort to incorporate the social sciences into a comprehensive research program (Mooney, Duraiappah, & Larigauderie, 2013). This has culminated in the “Future Earth”<sup>6</sup> research effort. This program seeks to “develop the knowledge for responding effectively to the risks and opportunities of global environmental change and for supporting transformation towards global sustainability in the coming decades.” Since this program has just been initiated, it is too early to tell if this research effort will bridge the divide between the social and natural sciences.

A second major effort within sociology centers on the American Sociological Association (ASA) Task Force on Climate Change. Noting the inadequacy of current sociological efforts to address climate change, the ASA convened this task force in 2011. The report of this research effort is slated to be published by Oxford University Press in 2013. Finally, the Institute for Advanced Studies at Princeton University has developed a program to be carried out in the 2013–2014 academic year titled “The Environmental Turn and the Human Sciences.” This effort involves a detailed investigation into the “on the strategies that different disciplines are adopting to deal with the challenge of environmental crises.”<sup>7</sup>

As early as 1978, scholars recognized the need to expand the concerns of sociology and the other social sciences to encompass the global environment. Since that time, there has been substantial progress in a number of areas. However, with the advent of global climate change, the notion of the inadequacy of the social sciences in view of our changed historical circumstances has become increasingly widespread. As a result, there are a number of initiatives under way to develop a more adequate post-holocene social science. This is a major emerging development in the social sciences, and this topic stands at the forefront of their future development.

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