

The Political Economy of Nature Field Statement

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December 1, 2013

Introduction

This document is designed to broadly sketch the political economy of the natural environment as a field of study. What follows is a review of pertinent literature contained within the field. A political economy of the natural environment asserts that a study of nature must incorporate political, cultural and historical factors. As Tim Forsyth describes, this field requires “reevaluation of environmental science by considering the intricate ways in which science and politics are mutually related.”¹ I broaden this definition somewhat to include cultural factors as well. Environmental conflict, resource management and distribution, environmental degradation and climate change are studied within their particular temporal and geographic locations alongside traditional cultural studies concerns of class, gender and race. Simply put, this field explores the effects of economy on the natural environment, with particular attention paid to our current mode of production.

To shape the field, I begin with a brief discussion of the origins of political economy that includes David Ricardo and Adam Smith, along with Karl Marx and other early economists. Marx’s critique of capitalism uncovered the conversion process through which nature is accumulated and converted into a commodity to feed the machines of the Industrial Revolution. The second section chronicles the initial responses to industrialization through the conservation efforts of Gifford Pinchot and the environmentalism in John Muir’s writing. Whereas these turn-of-the-century conservationists either believed nature (or at least sections of it) could be separated from the market, as Muir did, or believed that natural resources should be harvested in seemingly responsible ways, as Pinchot did, mid-century writers exposed the harm wrought by technological management of nature. A few years later, American writers Leo Marx and Rachel Carson approached a similar issue – the destruction of the environment – through

radically different methods. Carson concentrated on the science of pollution and the effects on both people and animal populations while Marx used literary criticism to highlight the destructive power of encroaching industrialization on the 19th century. Placing these texts in relation to each other will create a useful tension between how human interaction to the environment is dependent both on physical interactions and aesthetics. The question for writers during this time period is shaped by a question of value: are the actions of the market worth the cost – paid for in the destruction of bucolic America and in the destruction of the environment?

The third section documents the alarmist tendency continued from the 1960s into the 1970s with a resurgence of romanticism, seen in the Deep Ecology movement, alongside market-oriented ideas contained within the Keynesian inspired “Small is Beautiful” essays by E.F. Schumacher.² Neo-Malthusians began to emerge as well; the Club of Rome’s publication of *The Limits of Growth* reflected both a population scare and the emergence of computer environmental modeling, and Garrett Hardin developed his “competitive exclusion principle” which combined both idea from Malthus and Darwin. The pessimistic theories surrounding population failed to materialize into world-wide economic or environmental collapse, and this period saw the apex of global Neo-Malthusianism.³ Though population theories continue to play a role in ecological discourse, they are often geographically limited to specific and impoverished areas such as India or Sub-Saharan Africa.

The fourth section of this field covers Marxist ecological studies, which develop alongside the neo-Malthusian writers of the 1970s. In a direct response to the Malthusian call for limits to affluence and population due to resource scarcity, James O’Connor, Murray Bookchin, David Harvey, Neil Smith and others become leading critics and theoreticians on the connection

between the environment and the economy. These writers concentrate their efforts on uncovering the contradictions between capitalism and the environmental requirements for human survival.

The last section examines contemporary academic trends within the political economy of the natural environment, including updated work in Marxist ecology from John Bellamy Foster and other regular writers for the *Monthly Review* journal. The emergence of a geographically focused approach to social-environmental studies is documented as well, highlighted by the movement towards political ecology by Richard Peet and Michael Watts. While many political ecologists focus on issues in developing or underdeveloped nations, a few cultural critics have begun to use similar methods to explain the relationship between ecological pollution and poverty in the United States. Andrew Ross and Mike Davis have both contributed to a growing number of ecologically-focused urban studies.

Section 1: Nature and Resources in Classical Political Economy

The purpose of this section is to define political economy and outline the basic concepts explored by early classical political economists David Ricardo and Thomas Malthus to build a foundation for later considerations found within Karl Marx's writing, and in particular his concepts of metabolism and primitive accumulation. Political economy is the study of private property inside civic society that emerged with industrialization in the 17th and 18th centuries - primarily in England. Classical political economists, as Karl Marx called them, studied the nascent capitalist mode of production to understand how the early markets came into being, the process surrounding labor, profit, taxes and the effects each had upon civil society.

1.1 The Origin of Political Economy

For these early economists, nature (often expressed as “land” or “soil”) was the origin for resources. In particular, William Petty, Thomas Malthus, Adam Smith and David Ricardo, among others, set out to explain the process of production and resource distribution, positioning the lack of resources, or scarcity, as a primary factor in social relations with, as economist Michael Perelman points out, “little more than the writings of business people and moral philosophers to guide them.”⁴ Perelman identifies the possibility that these early economists may have had a “vague” awareness of the “social division of labor”⁵ which occasionally surfaced in their works, but was ill defined. More often in their formal theoretical works (as opposed to letters or diaries), the early political economists found that market production was a more efficient means of producing goods from natural resources, and promoted the conversion to a market based economy. Yet the conversion was not without cost, represented by the removal of support systems from people – support systems defined by access to natural resources.⁶

David Ricardo begins *On the Principles of Political Economy and Taxation* by outlining his predecessors, who he names as John Stewart Mill, Adam Smith, Thomas Malthus, and others, as failing to respect “the natural course of rent, profit and wages.”⁷ Ricardo understood social construction, in part, by the relationship to land via rent: “The produce of the earth – all that is derived from its surface by untied application of labour, machines, and capital, is divided among three classes of the community; namely, the proprietor of the land, the owner of the stock or capital necessary for its cultivation, and the laboureres by whose industry is cultivated.”⁸ Ricardo predicted that unused land would lead to a decrease in economic growth. “Unused” was defined as being outside of a predictable market; unused land could not be allowed to exist inside a

successful market economy. The process of converting common land into land useful for labor markets became the focus of Marx's discussion on primitive accumulation in *Capital*.

Malthus argued that limited resources led to poverty, famine, and a gradual decline in population.⁹ He based his conclusion on a formula he derived by comparing the “geometrical” population growth to “arithmetic growth” of food production. In other words, food production is incapable of keeping pace with population growth. In “An Essay on the Principle of Population” he claims, “the passion between the sexes” will outstrip the earth's power to “produce subsistence for man.”¹⁰ He believes that overpopulation leads a resource crisis, and the resulting scarcity decreases the quality of life for everyone. Though Malthus' theories have been criticized, notably by Marx,¹¹ they have also been used as one of the defining caricaturists of various strands of economics and environmentalism.¹²

1.2 Primitive Accumulation

Building on (and critiquing) the political economists before him, Karl Marx becomes a central figure in the political economy of nature as he was one of the first to offer in-depth analysis of the relationships between societies' mode of production and nature. He took a somewhat different approach in his examination of political economy by offering what he believed to be a more historically grounded analysis that was able to account for social relations under capitalism. He believed that earlier political economics assumed private property existed, but did an inadequate job of explaining what happens when private property enters public markets. Marx's goal was to determine the logic of capitalism and how this logic affected social relationships. In the “Economic Manuscripts of 1844” Marx offers a definition of political economy which incorporates the connections between society, labor and nature:

On the basis of political economy itself, in its own words, we have shown that the worker sinks to the level of a commodity and becomes indeed the most wretched of commodities; that the wretchedness of the worker is in inverse proportion to the power and magnitude of his production; that the necessary result of competition is the accumulation of capital in a few hands, and thus the restoration of monopoly in a more terrible form; that finally the distinction between capitalist and land-rentier, like that between the tiller of the soil and the factory-worker, disappears and that the whole of society must fall apart into the two classes—the property *owners* and the propertyless *workers*.¹³

Though this was one of Marx's earlier works, it contains the root of his argument surrounding “so called”¹⁴ primitive accumulation – the separation of people from their means of production in order to create markets where none existed before. He devotes the final section of *Capital Vol. I* to the historical processes during the “pre-history of capital” that were necessary to change the mode of production from a feudal society into a capitalist one.¹⁵ Marx documents the process where “newly freed men [from feudal society] become sellers of themselves only after they had been robbed of all their own means of production.”¹⁶ Once people are separated from the means of production (the land they worked for food and resources) they became wage-laborers for the growing number of industrialists.

The concept of primitive accumulation began with Adam Smith's description of the division of labor in *The Wealth of Nations*. Smith attempts to describe the process surrounding the creation of ownership in a company (stock), as a prerequisite for the division of labor. In *The Wealth of Nations*, Smith writes, “the accumulation of stock must, in the nature of things, be previous to the division of labor.”¹⁷ This statement has two basic assumptions: first that the division of labor did not exist prior to capitalism and that stock is a natural phenomenon. Marx critiques Smith on both points in the first volume of *Capital*.

Perelman provides a bit of linguistic context to the dialog between Marx and Smith, noting that Marx translates “‘previous,’ as ‘ursprünglich’ which Marx's English translators, in

turn, rendered as ‘primitive.’¹⁸ In other words, the process these early political economists were working to describe is the origin of capital accumulation within pre-capitalist society. Marx rejects Smith’s logic of the separation of labor because it is not materially defined – it simply always exists for Smith. Yet, Marx argues that the division of labor is socially constructed, critiquing Smith for offering assumptions about the division of labor that take on an almost theological flair that Marx rejects outright: “This primitive accumulation plays in Political Economy about the same part as original sin in theology.”¹⁹ Marx reworks Smith’s non-historical account of primitive accumulation via working through empirical examples found in pre-industrial England. He describes the events (both policy and economic) which surround the divorce of the peasant from traditionally worked land, the accumulation of capital within the growing number of industrialized farms. This conversion process becomes a key point for later Marxists²⁰ and others working towards an understanding of the effects of capitalism on humanity’s connection and dependence on nature.

1.3 Metabolism and Nature

Marx turns to Leibig’s concepts as part of his discussion of agricultural production and alienation from nature as it relates to decrease in soil productivity. Using Leibig’s findings, Marx then combines the materialist conception of nature with the materialist conception of history to develop a political economy based on the concept of “metabolism,” a concept described as the connection between humans and the land they depend upon for survival.²¹ In Marx’s words:

Labour is, first of all, a process between man and nature, a process by which man, through his own actions, mediates, regulates and controls the metabolism between himself and nature ... [Man appropriates] the materials of nature in a form adapted to his own needs. Through this movement he acts upon external nature and changes and in this way he simultaneously changes his own nature.²²

The dialectic doublet in this section provides an example of the intertwined relationship of people and nature. Neither is given primacy; they are two sides of the same metabolic system. Marx bases his descriptions of the metabolic process on previous work of the agricultural scientists Justus von Liebig.²³

Following Liebig, Marx argued that soil does not lose fertility based on an inexplicable and unavoidable phenomenon (as had been previously thought), rather it is man's misuse of the soil which causes it to be nonproductive after a few years of growing crops. Marx describes the link between nature and human production a metabolic connection (John Bellamy Foster uses the term "metabolic rift" to describe the separation between humans and nature²⁴). The separation between humans and nature is manifested in the separation between town and country which developed once the population became disconnected from, to use Marx's terminology, the soil (what would today be called "nature").²⁵ For example, Marx illustrates how the capitalist system prevents the tenant from caring for the land in the proper way in the second volume of *Capital*.²⁶ Under capitalism, it is not in the best interest of those who work the land to add fertilizer (manure) to the soil to replenish the nitrates. The tenant's lease on the land is simply not long enough for him to return a profit through proper maintenance, or as Marx states, the "desire for profit" had "exhausted the soil" of England.²⁷

Liebig's work in agricultural chemistry also influenced Marx's and Engels' attitudes towards Malthus. In particular, Engels presented Malthus's work as an "infamous and vile doctrine, this abominable blasphemy against man and nature" for both failing to comprehend the power of agricultural science and the needs of the working class.²⁸ Both Marx and Engels viewed Malthus's theory on population as a way for him to dispense with the poor, who Malthus believed to be "useless and wretched beings" that should not be supported with charities or

services, but prevented from reproducing in cases of overpopulation.²⁹ Engels's *Condition of the Working Class in England* paid particular attention to the plight of working class neighborhoods where the air was polluted with soot from a nearby factory. While the documentation of early pollution levels could be seen as the beginning of environmental work, where Engels' theory stands out was his analysis of nature as a concept.³⁰

According to Engels, the medieval period divided nature into discrete sections, objects were placed inside classes and science organized its method around these groups. Yet the dialectical method, borrowed from Hegel and applied to science,³¹ allowed Engels to conceptualize complete systems. He was able to “comprehend things and their representations, ideas, in their essential connection, concatenation, motion, origin and ending” and thus conceptualize the connections between economy and the properties of soil or labor and increased air pollution because science was no longer viewed in separate pieces, but as moving social mechanisms.³²

1.4 Early Examples of Socialist Utopia

Marx's *Capital* heavily influenced William Morris, an English designer, fiction and political writer in the late 19th century. He was a founding member of the short-lived Socialist League, a utopian socialist group founded in 1884 when founding members split with the Social Democratic Federation in the United Kingdom. It was during his work with the Socialist League that Morris published the “News from Nowhere” in the *Commonweal*, a U.K. socialist newspaper run by the League. “News from Nowhere” was part political treatise and part science fiction that described a world that functioned according to utopian socialist principles. One of the key themes within Morris's story is that the inhabitants have learned to live in harmony with

nature (or in more contemporary terms, they have achieved a level of sustainability). In a description of the socialist world, one of the characters explains that they “pass our lives in reasonable strife with nature exercising not one side of ourselves only, but all sides, taking the keenest pleasure in all the life of the world.”³³ The sentiment that humans were divorced from nature by means of capitalist production, an idea explicitly stated in Marx, is repeated at various points throughout *News from Nowhere*, especially when a character describes the 19th century: “It was natural to people thinking in this way, that they should try to make 'nature' their slave, since they thought 'nature' was something outside them.”³⁴ Essentially Morris has attempted to show the process of primitive accumulation via science fiction parable. Florence Boos defines much of Morris’s other work as a precursor for many contemporary environmental studies from “all of its various hues of green - from ‘deep’ ecological and ecofeminist ‘theorists’, to ‘pragmatic’ actives and resource planners.”³⁵ Though, she points out that Morris own beliefs are based in a Romantic view of nature

Section 2: Environmentalism and the Growth of Industry

At the start of the 20th century American Romantic naturalists and conservationists recognized the growing split between people and their natural environment as well. Emerging from these early forms of environmentalism, writers began to connect our social institutions with the reason for the separation. Where Muir simply felt a life live apart from nature was inauthentic, he was unable to provide a firm scientific context to the genesis of his feeling. Karl Polanyi and, a few years later, Raymond Williams, directly address the social reasons for the separation between people and nature that left Muir feeling less than whole. Though they

approach the topic from different disciplines, both Polanyi and Williams recognize that nature becomes a product that is shaped by social institutions.

2.1 Early Conservation & Environmentalism

In the United States, the conservation movement during the late 19th century adopted an aesthetic not entirely dissimilar from the Romantic writers³⁶ and landscape painters³⁷ of the era. George Marsh and John Muir³⁸ understood nature to be valuable for its own sake, describing public land as a necessity for social contentment.³⁹ A few years later, Gifford Pinchot, under direction from President Roosevelt, created the U.S. National Park Service as a way to solidify the public's connection to nature and providing better resource management.⁴⁰ He believed nature required government management to prevent overproduction that caused irreparable destruction, writing that because the population "depended on natural resources for every material necessity, comfort, convenience, and protection in our lives. Without abundant resources prosperity is out of reach."⁴¹ His approach to find the "greatest good for the greatest number" became the backbone of early conservationism. Pinchot's utilitarian view of nature was somewhat at odds with the brand of environmentalism espoused by Muir, who believed public space should remain pristine by removing the resources from the market entirely. Where Pinchot engaged in a cost-benefit analysis of natural resources Muir saw nature as a sublime expression that every citizen had a right to experience. In the United States, this mode of conservation was standard until the 1960s. It was the forestry and reclamation projects begun in the Depression that solidified American conservationism in combination with the modernizing effect of capitalist technology.

2.2 The Great Transformation and The Country and the City

Karl Polanyi stands out as an influential economist for theorizing the process of connecting land to human institutions: “What we call land is an element of nature inextricably interwoven with man’s institutions. To isolate it and form a market out of it was perhaps the weirdest of all undertakings of our ancestors.”⁴² In both a continuation and a critique of Marx’s political economy, Polanyi returns to the classical economists to explore the cultural changes required and caused by the shift towards a capitalist economy. He suggests that prior to industrialization civilizations simply didn’t have any recognizable market economy. The creation of a market-based economic structure therefore creates a massive cultural upheaval, or “great transformation.” His project is similar to Marx’s in that he unpacks the required social structures under capitalism. Much of this writing explores the concept of primitive accumulation, even though he doesn’t name the process as Marx did. He argues that separating land from man was needed to organize a society that met the requirements of a market economy.⁴³ He discusses the stages of connections between man and nature historically – the Tudors in England under agricultural capitalism that required individual ownership of the land, to the industrialized capitalism that was still rural but needed space for mills and housing for workers to the modern shape of industrial towns requiring “practically unlimited food and raw material supplies” by the nineteenth century.⁴⁴ He notes that while the capitalist system did lead to prosperity for some, overall this mode of production is ultimately destructive to both people and nature due to capitalism’s constant crises. In other words, the growth of capitalist markets destroys its own social and environmental conditions that allow the market to exist.

Twenty-nine years after the publication of Polanyi’s *Great Transformation*, Raymond Williams returns to the topic of capitalism and the transformations surrounding land use by

tracing literary trends beginning with sixteenth century English writers. In *Country and the City* he analyzes rural imagery versus urban imagery in a variety of texts and offered “a committed perspective on the historical record (to which literature stands in varying relationships—from representation to misrepresentation, from myth to reality, from illusion to clarification).”⁴⁵ He catalogs the way literary imagery surrounding the transition to a “highly developed agrarian capitalism, with a very early disappearance of the traditional peasantry.”⁴⁶ Williams explains the disappearance of the peasantry lead to a separation between rural and urban life. The literary objects he inspects typically offer stereotypes or myths of the different ways of life; the city is described as a place of vice, worldliness and ambition while the country becomes a backwards place of ignorance and limitation.

Williams notes converse stereotypes are also true. Successive urban generations look back to “unspoilt” countryside and describe urban life as lacking in values.⁴⁷ Once populations began to abandon rural life in search of employment within urban areas, literary critics moved away from describing at reality into examining “influences and themes.”⁴⁸ Pastoral literature was written from an aristocratic perspective and did not translate the realities of rural life. The portrayal of the loss country life is nothing new, their demise has been lamented at least since the end of the 1620s in Philip Massinger’s *The City and the Madman* where “commercialism is breaking the old landed settlements and its virtues.”⁴⁹ The trend can be traced to Thomas More’s *Utopia*,⁵⁰ published in 1516, where “another old order is being destroyed.”⁵¹ The “old order” being destroyed is a reference to the transition away from traditional farming and into a capitalist version of farming. Pastoral literature was a way for writers to justify the growth of capitalist farms.

Williams notes, “it has been commonplace since Marx to speak, in some contexts, of the progressive character of capitalism, and within it of urbanism and of social modernization.”⁵²

But, capitalism is “Janus-faced,” containing both urban miseries of factories and towns as well as a historical scheme with the potential for a progressive politics.⁵³ Williams believes the eventual deterioration of capitalism’s progressiveness will create space for a socialist future. Determining this future requires an understanding of history, not simply pastoral longing for a simple life.

Williams writes, “Between the simple backward look and the simple progressive thrust there is room for long argument but none for enlightenment. We must begin differently: not in the idealizations of one order or another, but in the history to which they [the authors he analyzes] are only partial and misleading responses.”⁵⁴ Therefore the wish to return to nature/pastoral life is not an option because nature is no longer “simple” once it comes under the dominion of a capitalist system; the “country” and the “city” are inextricably connected. He concludes the book by noting the impossibility of breaking England into a binary relation between “country” and “city” calling for a recognition of the complexity of the fluid relationship between the two, and “new kinds of social and physical organization.”⁵⁵ John Eldridge notes in *Raymond Williams:*

Making Connections:

If politics is to be defined only in terms of the capitalist interplay of interests, that, for him [Williams], would be the end of politics in any sense which would be understandable to him as a political thinker and activist. This, we may add, is a call not for a retrospective but for a prospective politics.⁵⁶

Ultimately then, his project is not simply a critique of the current political environment, but a call to move forward which can only be accomplished by coming to terms with the contradictions within capitalism.

2.3 Technology, Nature, and Capitalism

Leo Marx responds to industrialization in *The Machine in the Garden: Technology and the Pastoral Ideal in America*, published in 1964, by marking the contradiction between an ideal American pastoral and the technological changes of industrial technology. Through an examination of American Romantics and early industrial eras writers (Hawthorne especially) Marx notes the seemingly unstoppable progress of technology and a culture dominated not by nature, but by technological systems required under a capitalist mode of production. Marx's work was seen as important not only in literary criticism, but as a way to expand the method to expose "real world" cultural systems.⁵⁷

One of the key theories in *The Machine in the Garden* is the creation of the "technological sublime," postulating that people responded to human construction endeavors with a similar sense of awe as they once did with nature. David Nye, a student of Leo Marx, continued Marx's observations within the concept of the technological sublime through his own work, describing America's identity with technology by expanding the theory of the technological sublime.⁵⁸ Nye argues that technology began to fill the subliminal role nature once dominated. For example, where John Muir found the sublime in the mountains of northern California, Nye argues that the modern, industrial citizen looks to the Hoover Dam or Brooklyn Bridge to find the sublime within construction technology and human accomplishment. Therefore human creations begin to work as a substitute for nature.

Whereas Leo Marx and Nye examine the aesthetics of technology and the relation to nature, other writers began to take a direct approach within the hard sciences. Rachel Carson's *Silent Spring* was emblematic of the progressive work scientists began to produce during the formation of the ecology moment in the 1960s. *Silent Spring*, first published in 1962 may be

viewed as a case study for the type of technology Polanyi believed capitalism produced and Marx and Nye critiqued. She combined social criticism with her background in science and history, allowing her text to cross disciplinary boundaries while being suitable for non-technical readers. *Silent Spring* became widely popular, earning Carson a spot on the *New York Times* bestseller list, and more importantly, is directly credited with being the catalyst for the public outcry to ban DDT. She acknowledges the connections between nature and economics in the introduction to *Silent Spring*:

There is still very limited awareness of the nature of the [environmental] threat. This is a fear of specialists, each of whom sees his own problem and is unaware of or intolerant of the larger frame into which it fits. It is also an era dominated by industry, in which the right to make a dollar at whatever cost is seldom challenged. When the public protests, confronted with some obvious evidence of damaging results of pesticide applications, it is fed little tranquilizing pills of half truth.⁵⁹

Directly critiquing both technology and capitalism, Carson was able to show the inefficiency and short sightedness of business-friendly policy decisions which allowed widespread pesticide use. She tied economic concepts to nature by placing technology within the scope of culture.

Section 3: Environmental Debates in the 1970s – 1980s

As the post-war economy grew in the U.S. and Europe, social scholars and physical scientists alike began to examine the effects of affluence on the environment. Some writers, such as P.F. Skinner and Frances Moore Lappe and called for limits on either economic growth itself by attempting to limit consumerist behavior. Neo-Malthusian thinkers also became prevalent, seeking to limit environmental degradation and all the social ills associated with an unhealthy ecology (pollution, hunger, disease, etc) by regulating the population. The call for limits became a target for critique from both established environmentalists such as Barry Commoner to radicalized anarchist Murray Bookchin.

3.1 A Return to Malthusian Concepts: Overpopulation and the Environment

One of the many reformulations of Malthus during the middle of the twentieth century is contained in two of Garrett Hardin's most influential essays, "The Competitive Exclusion Principle" and "The Tragedy of the Commons." Hardin held a Ph.D. in microbiology and focused his career on understanding human population and the problems he saw which arrived from overpopulation. He developed the "Competitive Exclusion Principle" which states: "complete competitors cannot coexist."⁶⁰ Hardin argues that if two populations "do exactly the same thing," and compete within "the same ecological niche" yet the reproduction of one species outpaces another and the extinction of the slower species is inevitable.⁶¹

In making his point, Hardin stresses the interconnectedness of populations and points to the difficulty in examining an ecosystem in its entirety: "What the whole ecological system is, we do not yet know. One immediate task is to discover the system, to find its elements, to work out their interactions, and to make the system as explicit as possible."⁶²

He is basing his idea loosely on Darwinism; or rather, on parts of the evidence Darwin cites when species are dominated by others and go extinct. However, he places the origin of the theory in Keynesian terms: "I have argued for the correctness of John Maynard Keynes view that biological principle of natural selection is just a vast generalization of Richardian economics,"⁶³ therefore linking the exclusion principle to economics. He also describes the naturalization of his theory, using the principle to explain why people engage in violence, even though the thought may not be fully conscious.⁶⁴

Hardin followed "The Exclusion Principle" with another notable article on scarcity, land use, and population in "The Tragedy of the Commons," an article where he sought to prove that

technological advances were incapable of providing adequate food supply for a growing population. He uses “the commons” as a metaphor to portray how people are incapable of using a shared resource to increase both food production and quality of life. Rather than link population to economy, Hardin chose to link overpopulation to ethics; determining a solution “requires a fundamental extension in morality.”⁶⁵ He adopts a utilitarian method to prove that earth’s resources are finite, that the world’s population will only increase, and that people are rational beings who act in their own self-interest. He reworks Marx’s English commons example to show how cattle ranchers will always seek to increase the size of the herd on shared lands, regardless of the overall damage, stating: “natural selection favors the forces of psychological denial.”⁶⁶ If a company has more to gain by polluting the air or water, they will do so, a process which leaves technology incapable of solving for human behavior. For Hardin, every environmental issue is caused by overpopulation, and “it is a mistake to think that we can control the breeding of mankind in the long run by an appeal to conscience.”⁶⁷ The only available solution Hardin discusses in his work is coercion or policy.

Hardin recommends a type of coercion that is “mutually agreed upon the majority of the people affected” and rejects the possibility of common property in a contemporary society because any scarce resource is likely to be abused by those who share the resource.⁶⁸ He also rejects notions of social organization as well, preferring a mixture of social Darwinism in combination with Malthusian ideals: “Perhaps the simplest summary of this analysis of man’s population problems is this: the commons, if justifiable at all, is justifiable only under conditions of low-population density. As the human population has increased, the commons has had to be abandoned in one aspect after another.”⁶⁹ He goes on to say that “the most important aspect of necessity that we must now recognize, is the necessity of abandoning the commons in breeding.

No technical solution can rescue us from the misery of overpopulation. Freedom to breed will bring ruin to all.”⁷⁰ His staunch rejection of freedom and concern for resource scarcity has been the basis for much of the neo-Malthusian writers and scathing critique from socially-oriented writers.

3.2 Population Control in Popular Texts

Two examples of Hardinian thinking became best-selling academic books in the 1970s. *The Population Bomb* and *The Limits to Growth* both found that an increased global population strained both the environment and the economy during a period that also birthed conceptions of Gaia Theory⁷¹ and Spaceship Earth⁷². The Club of Rome⁷³ published *The Limits to Growth*, a UN report that became a bestselling environmental text in 1972.⁷⁴ In a burst of algorithmic Malthusianism, the report commissioned systems analysis at MIT to develop a software model⁷⁵ to account for the interaction between population, food production, industrial production, pollution, and consumption of non-renewable resources. The conclusion from the report was that limits to global resources would be reached somewhere in the middle of the 21st century causing a collapse in population and economy.⁷⁶ The model has been heavily criticized⁷⁶ for failing to provide accurate predictions, yet the results may have been subject to both oversimplification and misinterpretation. Graham Turner points out in a 2008 article, “The World3 model was not intended to be predictive or for making detailed forecasts, but to provide a means for better understanding the behavior of the world economic system.”⁷⁷ By most accounts, the software performed as intended with varying degrees of success. Despite the inaccuracy of its predictions, this text marks the beginning of contemporary public dialog centered on sustainability and resource scarcity. Political economy and the natural environment begins to be understood in

either terms of sustainable resource usage based on the idea of limiting our use – a direct assault on the affluence of Western post war culture.

Paul and Anne Ehrlich's continued this trend in the Malthusian classic, *The Population Bomb*, a text which linked the population issue and the environment in the mind of the public. He called for population control measures in the United States "hopefully through changes in our value system, but by coercion copulation if voluntary methods fail."⁷⁸ Published in part with the Sierra Club, the Ehrlichs declare the US will undergo massive food shortages if population is not brought under control. He ties most modern social ills, which he sums up as the "brutal" condition of contemporary politics (war, famine, poverty, etc.), to overpopulation. Both through the book and their non-profit organization, Zero Population Growth (founded in 1968) the Ehrlichs worked to find solutions for what he believed to be the most severe threat to the environment – people. Their method was fairly straightforward and purely Malthusian: "No matter how you slice it, population is a numbers game."⁷⁹ They argue that population grows exponentially, which leads to environmental degradation in developed countries and food and water shortages in developing nations. Ehrlich expresses the math in the quickening of "doubling time" – the time it takes for a given population to double. Therefore population growth will outstrip food production, compounding issues with an already underfed world. They summarize the argument:

There is not enough food today. How much there will be tomorrow is open to debate. If the optimists are correct, today's level of misery will be perpetuated for perhaps two decades into the future. If the pessimists are correct, massive famines will occur soon, possibly in the 1970s, certainly by the early 1980s. So far most of the evidence seems to be on the side of the pessimists, and we should plan on the assumption they are correct.⁸⁰

Though these dire predictions did not surface in the exact way Ehrlich predicted, various iterations of the text have been kept up-to-date through new editions of the text and on-going articles.⁸¹

3.3 Barry Commoner's Critique of Population Control

Echoing the split between Malthus and Marx, Paul Ehrlich also offered critique of other environmentalists during the early 1970s from a population perspective. Ehrlich, along with colleague John Holdren, sought to point out deficits in the socially-oriented ecologist Barry Commoner's book *The Closing Circle: Man Nature and Technology*, a text which examined social causes for disruptions and pollution of the "ecosphere." Commoner determines the increase in pollution from 1956 has led to an environmental crisis at the behest of industry. He raised the ire of neo-Malthusians by dismissing population concerns as a "reductionist" methodology, "characteristic of much of modern research" and was not "an effective means" of analysis.⁸² In a review of Commoner's book in the *Bulletin of Atomic Scientists*, Ehrlich and Holdren concluded *The Closing Circle* was "inexplicably inconsistent and dangerously misleading" because the text gave the impression that pollution did not exist until after World War II.⁸³ Also, they took issue with Commoner's concentration of pollution as the only detriment to the environment, pointing out the cancerous effect of human populations on natural ecosystems throughout human history.⁸⁴ For Ehrlich and Holdren, population control must be part of any environmental solution, citing any other approach would be "one dimensional" otherwise, and that the "pessimists view" was simply the safest route to environmental sustainability.⁸⁵

The same issue of the *Bulletin* published a response by Commoner, who approaches the critique from Ehrlich and Holdren through both a historical and logical argument.⁸⁶ Part of Commoner's resistance to population control rests in the many contradictions he found within the environmental movement. One of the motivating factors of his research, according to Commoner, was to dispel overpopulation theories that lacked "any firm, especially numerical, supporting data for [their] conclusion."⁸⁷ The differences between population-centric thinking of Ehrlich and the technology/production focus of Commoner became a point of contention within both the academic and public environmental communities. Part of Commoner's goal in writing the response in the *Bulletin* was to clear up any misconceptions about his method, offer additional explanations of the raw data behind his research and how it interacted with Ehrlich's own research, and most importantly to bring the environmental debate into public view. Prior to the publication of both Ehrlich and Holdren's critique and Commoner's response, Ehrlich and Holdren sent a letter to Commoner asking him to refrain from engaging in public debate as the matter of methods was a scientific one, not designed for lay-people. They did not want to split the already fragile environmental movement. Commoner however, believed scientific debate belonged well within public discourse because of the consequences and complexity of environmental research: "the environmental crisis involves very grave and complex social problems that ought to be resolved by public decision and not determined by the force of private agreements among scientists."⁸⁸

In many ways, Commoner's work to critique production processes and affluence within developed nations that led to environmental degradation can be viewed as a continuation of Rachel Carson's work in *Silent Spring*. The scientific analysis provided by Commoner, Carson and other early scientists were often narrow in their focus, therefore proposed solutions often

concentrated on either individual companies taking action, private citizens taking action in the though self-limitation, or the creation of eco-regulatory bodies to reduce pollutants.⁸⁹

3.4 A Radicalized Social Ecology

Simultaneous with the popular environmental movements headed by Commoner and Ehrlich, Murray Bookchin's work offered a radicalized theoretical approach to environmental studies. Basing his thoughts on a mixture of Marx, the Frankfurt School and Peter Kropotkin, Bookchin sought to determine the ways people might separate themselves from a hierarchal social structure that allowed for a peaceful co-existence with nature. His ecological theory focused on creating a "social ecology" (also an academic discipline) that required unpacking the existing social structures to uncover the "irrationalities" it contained (to put this in Marxist terms, he was examining the contradictions contained within a capitalist society). Lumping Commoner and Ehrlich together as part of the established, "vapid," environmental movement focused on either personal responsibility or population, Bookchin's goal was to move beyond 1970's environmentalism to an ecological practice that required a decentralized, cooperative society where "members live in harmony with one another."⁹⁰ Bookchin's stress on social relations and institutions were designed to uncover the genesis of ecological crisis. In *The Ecology of Freedom* he grounds his social ecology theory in the "system of obedience and command" which keeps a social hierarchy rooted in our current social structure.⁹¹ He intends the concept of hierarchy to surpass Marx's definition of class to encompass any elite within society, regardless of material wealth. However, the concept of hierarchy is applied to people's rule over nature. Bookchin stresses the necessity for creating a harmonious relationship with nature as opposed to earlier ecological movements that stressed the usefulness of resources rather than the requirements for a

harmonious relationship. This is not to say that Bookchin was a mythic or romantic, quite the opposite. In a social ecology newsletter for *Green Perspectives* he offers a polemic against the Deep Ecology and neo-Malthusian approaches to environmentalism which is “anti-human” in their construction and only serves to further entrench hierarchal social structures and thus continued environmental destruction.

Bookchin’s co-author at the *Green Perspectives* newsletter, Janet Biehl is also an active producer of texts concerning decentralization, social ecology, and eco-feminism.⁹² In her book *Rethinking Eco-feminist Politics* she laments the production of eco-feminist texts which reject all previous social theory as “masculine,” thus attempting to work in a realm outside of social theory. She notes that contemporary eco-feminism, rather than asserting a connection between the subordination of women and environmental degradation, has promoted a tendency to present a “mystified notion of ‘nature’” based on women’s connection to nature via childbirth. Both Biehl and Bookchin opposed such mystical presentations of nature often the pages of *Green Perspectives*.⁹³

Section 4: Expansions on Environmental Marxism

As academics began to explore a socially-oriented approach to ecology in the 1970s and 1980s, many turned to Marx and Marxisms to develop a political economy of the natural environment designed to question the co-existence of capitalism and a healthy ecosystem. As Ted Benton points out, theory in Marx’s *Capital* is notable for conceptualizing ecological conditions and “limits of human need-meeting interactions with nature.”⁹⁴ Ecological Marxism recognizes the limitations of capitalism in solving for or preventing ecological crisis.⁹⁵ Because capitalism is dependent on natural resources for production, the social relations required to create

surplus value are antithetical to any real change. Therefore, a Marxist ecology approaches biophysical needs provided by the natural environment as a function of the social conditions of production.

4. 1 Perception and Ecological Crisis

Two Marxist scholars questioned the method ecological crisis was studied; Hans Magnus Enzensberger and Ingolfur Bluhdorn each approached the concept of crisis from a methodological standpoint. Enzensberger's 1974 essay "A Critique of Political Ecology" critiqued contemporary ideas of crisis temporally, noting that even with the most accurate computer models, scientists were unable to predict when an ecological crisis would occur. Likewise, the scientists of the time were not in agreement on which factors were primarily responsible for an ecological crisis, nor was the scope of the crisis agreed upon. For Enzensberger, the concept of catastrophe itself was not static, that while some environmental crises would indeed end life on earth, a less severe crisis might "end of a social form based on large scale industrial production."⁹⁶ In other words, he foresaw an ecological crisis that force a capitalist society to adapt to a more socialist structure to be a positive aspect of crisis.

Ingolfur Bluhdorn questions the concept of crisis and catastrophe as well, though he writes that environmental crises are reflections of scientists and scholar's unease with the social structure. In other words, Bluhdorn does not believe the type of crisis environmental scientists predicted could become reality.⁹⁷ Bluhdorn argues that crisis is based in the contradiction between how people conceptualize nature in relation to the angst of a rapidly changing world. So the G3 computer model Meadows and other used to predict ecological disaster does not reflect reality, but rather the results of Medow's model reflect the "angst" they felt about contemporary

society, because Meadow's personal angst determined the type of data used in the study, and therefore preconditioned the results to show an environmental crisis.⁹⁸

4.2 The Second Contradiction of Capitalism

James O'Connor, develops "ecological Marxist theory" in his seminal "The Second Contradiction of Capitalism" published in *Capitalism, Nature, Socialism* (1988), he states that Marx only hints at the possibility of ecological crisis resulting in a capital crisis without ever fully developing a critique of environmental practices within capitalism. Instead, Marx concentrated on the periodic crises created by capitalism. Increases in surplus value limit the creation of additional surplus value, forcing the market to expand.⁹⁹ O'Connor states that Marx did not fully explore "the ways that capital limits itself by impairing its own social and environmental conditions,"¹⁰⁰ and offers a corrective by highlighting what he believes is a "second contradiction" of capitalism that takes into account the relations between production and the conditions of production (the environment), as opposed to the classical Marxist contradiction of capitalism which only exists between the forces (labor) and relations of production. The former leads to underproduction while the latter leads to overproduction.¹⁰¹

O'Connor's method pairs up definitions of traditional Marxism with sections detailing ecological Marxism. Production has three conditions: first is labor-power, second are external conditions of production (land) and third are the "general" conditions (infrastructure).¹⁰² He first shows the traditional Marxists account of capitalism as a crisis-ridden mode of production, and secondly, how capitalism's dependence on these crises leads to the potential for socialism. So he couples a traditional Marxist account of crisis side-by-side with the ecological focus of a "crisis-dependent system" in order to arrive at a description of the cannibalistic nature of capitalism

which he describes as being depending upon the natural resources it destroys.¹⁰³ For Marx, the contradiction engenders a labor movement with the potential for socialist transition, yet O'Connor argues that this second contradiction has the potential to restructure the "conditions of production" into a social structure.¹⁰⁴ Socialism is therefore possible through both a labor movement and an environmental movement because each has the ability to disrupt capital and there may be interaction between these two contradictions. O'Connor builds his theory by reconstructing a materialist version of history as an explanation of the "ecological dimensions of social life."¹⁰⁵ He breaks apart the idea of class as it relates to the environment; the path to socialist policy is no longer class dependent as the potential for environmental crisis cuts across class lines. To put this idea into O'Connor's terms: the contradiction is no longer confined to "internal" mechanisms of the social conditions of production, but can be defined as the "external" environmental conditions of production.¹⁰⁶

4.3 Responses to O'Connor

While O'Connor's work was influential in connecting ecological theory to Marxist theory, his work has been used as both a point of departure and critique.¹⁰⁷ For example, Victor Toledo credits the Second Contradiction theory for being a springboard into the "ecological thought" of Marx, he does not believe it stands on its own as a viable theory, calling for a more detailed analysis (though he does not attempt such an "enormous challenge" within the critique).¹⁰⁸ Toledo argues that ecological crisis happens under both capitalist and socialist economies, so further evidence is needed to cement the connection.

Echoing O'Connor, but taking the analysis a step further in the *Greening of Marxism*, Benton concludes that environmentalism, and the "crisis of socialism and the environment" have

allowed for alternative methods of resistance to capitalism, and create the potential for new thinkers to “reject the idea of a historic transformation led only by the working class.”¹⁰⁹ He argues that only viewing ecology through the lens of production does not allow society to escape environmental catastrophe. Bringing classical Marxist theory into question, he determines that it is no longer up to the proletariat alone to work towards revolutionary social structure capable of solving for environmental crisis. Rather, the ecological crisis alone can “reverse the dominant economic rationality and generate the conditions for the socialization of environmental resources.”¹¹⁰

Other writers state there was no reason to split Marx’s work into additional contradictions. Enrique Leff argues that there is only a single contradiction “between the needs of capital and the needs of human beings.”¹¹¹ Leff grants that O’Connor may have highlighted a different formation of the inherent contradiction between labor and capital, but he argues that it is theoretically pointless to separate ecological needs from biophysical needs. In opposition to Benton, Leff believes that economic revolution is a requirement to prevent an ecological crisis because the root of the problem is purely economic.¹¹² Therefore, the only path towards an alternative to capital must come through a populace willing to dispose of capital itself – any other motive is a distraction. John Bellamy Foster’s seems to agree with Leff, pointing out that the capitalist profit motive is stronger than O’Connor believes. We should not “underestimate capitalism’s capacity to accumulate in the midst of the most blatant ecological destruction” and therefore should continue to approach ecological crisis as a function of economic crisis, not vice-versa.¹¹³

4.4 Socially Produced Nature

Concurrently during this period, other scholars were addressing the divide between nature and culture by theorizing how nature has been imagined within cultural studies. Two key texts that challenged the definition of nature are Niel Smith's *The Production of Nature* and Donna Haraway's *Simians, Cyborgs and Women: The Reinvention of Nature*. *The Production of Nature* is a key text credited for calling into question how nature as a concept is culturally produced. The author, Neil Smith, recognizes that at first glance, it is counter-intuitive to view nature as anything besides material reality, but he goes on to explain:

Nature is generally seen as precisely that which cannot be produced; it is an antithesis of human productive activity. In its most immediate appearance, the natural landscape presents itself to us as the material substratum of daily life, the realm of use-values [usefulness of something] rather than exchange-values [the value derived from the market sale of something].¹¹⁴

In contrast to O'Connor and earlier theorists, who categorize nature as a static entity and a universal concept, Smith's thesis on how people form definitions of nature state that nature is a socially produced concept, so the way we define nature evolves historically as cultural changes. He poses the question: what is nature and how does a particular culture define it? For Smith, because nature is socially produced, it cannot be thought of as *external* to humanity, but an internal part of society. Therefore, any theory that treats nature as a separate entity or an external element employs false logic. There can be no real separation between humans and nature, only the *appearance* of a separation.

Smith continues his explanation, saying that the appearance of a separation occurs because the processes endemic to capitalism translate this appearance into social practice. David Harvey provides a good example of *The Production of Nature* in the article, "Population, Resources, and the Ideology of Science." Harvey critiques the theories contained in the *Limits to Growth* and

other Malthusian work of during the 1970s that presented resource scarcity as reality, when it was, to use Smith's term, an "ideology of nature."¹¹⁵ As Harvey points out, the resources are not limited; there was more than enough to allow everyone to sustain a high standard of living. Harvey considered the shortages Meadows and Elrhich predicted to be gross miscalculations based on insufficient or incorrect data.¹¹⁶

Similar to Smith, Donna Haraway also grapples with "nature" as a socially determined concept. In working through cultural definitions of nature, she finds "nature" to be an ill-formed concept, which should be rethought and repositioned in the public imaginary. In one of the well-known essays within *Simians, Cyborgs and Women*, "A Cyborg Manifesto," Haraway uses the dichotomy between nature and machines to reconfigure a postmodern feminism. Haraway challenges traditional notions of nature, arguing that "nature" as a culturally constructed idea leads to totalizing theories of gender that situate women as the "ground of life."¹¹⁷ She pushes feminists to move away from such naturalist tendencies, countering the ecofeminism of previous writers (e.g. Janet Biehl) who sought to strengthen women's ties to nature. She employs the cyborg metaphor because the "cybernetic organism [is] a hybrid of machine and organism, a creature of social reality as well as a creature of fiction" that allows her to break with a nature/machine dichotomy. This method allows her to construct a "socialist-feminist culture and theory in a postmodernist, non-naturalist mode" capable of imagining a "world without gender."¹¹⁸

Section 5: Critical Environmental Studies

Marx's influence in political economy of the natural environment continued, becoming especially present at the close of the 20th century. Environmental sociologists and the political

ecological concepts contained within “liberation ecology” texts called for both alternatives to capitalism, often framed in ecological theory as well as renewed concentration on the plight of the world’s poor. Also included in this section is a representation of the growing number of ecologically-focused urban studies. Both Andrew Ross and Mike Davis have produced works that critique cities responses to environmental crisis because city planners are forced to focus on short term economic goals rather than lasting environmental solutions. These short term goals typically serve the needs of an elite class while shuffling pollution off to impoverished sections of the city.

5.1 Liberation Ecology & Environmental Imaginary

The emergence of the sub-field “political ecology” in the 1960s became a way for social scientists to describe projects that dealt with the interplay of economy, geography,¹¹⁹ and the natural environment.¹²⁰ Writers previously discussed within this document were considered to be pioneers in the field: Bookchin, Eric Wolf, and Enzenberger established themselves as scholars who attempted to describe the social power relations in “human-environmental interactions.”¹²¹ This approach was summed up in the West German Green political party established in the early 1980s. Rudolf Bahro, one of the founding Party members¹²² and East German dissident, held similar ideas as Leff and Enzensberger. He began to connect wider ecological concerns with Marxism, attempting to forge a “red-green” cooperation capable of addressing the disparities between developed and developing nations from an ecological standpoint.¹²³ Bahro believed that local, decentralized communities with small decision making bodies were better for the environment because they allowed for an alternative to the industrial business models that were incapable of caring for communities. Small communities are capable of producing the resources

they require. This was a common idea in Germany, and many connected the Green Party to earlier Romantic ideals. Yet, where the Romantics defended their social order, the Greens also stressed an egalitarianism and grassroots political participation.

Echoing Enzensberger, Bahro did not believe that simply changing to a communist government by changing “legal ownership, from private to state” was capable of reducing environmentally destructive practices.¹²⁴ In doing so, Bahro broke tradition with classical Marxists. This break was carried on through the vein of scholarship often found under the heading “political ecology.” Whereas classical Marxist theorists concentrated on macro political theory (e.g. James O’Connor’s or John Bellamy Foster), political ecologists performed analysis of “micro-politics of peasant struggles over access to productive resources” and sought to understand the social structures which constitute those struggles.¹²⁵

In *Liberation Ecology: Environment Development and Social Movements* editors Richard Peet and Michael Watts describe political ecology as a way to explain environmental degradation as social problems rather than simply instances of poor technology, overpopulation, or squandered natural resources.¹²⁶ They expanded on the work of early Marxian ecologists and Neil Smith’s by looking for the “emancipatory potential of the environmental imaginary.”¹²⁷ Ecology is therefore no longer strictly an issue of class or economy. For example, Piers Blaikie and Brookfield’s *Land Degradation and Society*, a cornerstone text for political ecology, determined any relationship to nature “must be considered in a ‘historical, political and economic context.’” They applied these considerations primarily in an analysis of the water erosion of topsoil, which they discussed as a social issue.¹²⁸ Yet Peet and Watts needed to expand political ecology to account for evolving conceptions of nature:

What is striking, however, is the extent to which these new directions attempt to engage political ecology with certain ideas and concepts derived from poststructuralism, and cultural

and social theory. There is, in other words, an extraordinary vitality within the field reflecting the engagements within and between political economy, the power-knowledge field and critical approaches to ecological science itself.¹²⁹

These critical approaches are also evident in Donald Moore's work on environmental struggles in Zimbabwe where he approaches his research object through a Gramscian lens. He uncovers hegemonic power relations between cultural classes to understand the effect of social structure on the environment. The social ills associated with ecological destruction must be understood as a culmination of a global economic structure, environmental discourse, and local policy.¹³⁰ Everyday life then falls at the nexuses of competing and contradictory structures, both globally and locally, whereas previous classical Marxists theorists preferred to explain situations at a global level.

Similarly, Lakshamn Yapa attempts a reversal of previous ecologically-focused economy theories in her critique of scientific development. In her article concerning how the so-called Green Revolution used scientific advancement to create seeds with increased productivity, she shows her reader how science relates to "hunger, malnutrition, and poverty."¹³¹ New scientifically modified seeds, she argues, become a way for global companies to dominate both people and nature. Her "post-Marxist" method sets the scientific creation of improved seeds central to the Green Revolution at the nexus of academic, technical, social, cultural and ecological relationship and allows her to question how proposed solutions to ecological/poverty problems may further entrench local populations into poverty.¹³²

5.2 Contemporary Environmental Marxism

Debates within environmental Marxism in the late 1990s can be illustrated by an exchange between David Harvey and John Bellamy Foster within the *Monthly Review* in the spring of

1998. The debate centers on research methods expressed in type of language used to express environmental issues and ability to accurately describe the possibility or inevitability of environmental degradation. Four years before the publication of *Marx's Ecology*, David Harvey critiques John Bellamy Foster in his book *Justice, Nature and the Geography of Difference*. While Harvey and Foster tend to agree on the capitalist connection to ecological issues, Harvey found fault with the romantic language within Foster's *The Vulnerable Planet* – a text designed to target an audience outside academia, published seven years prior to *Marx's Ecology*. He believes Foster adopted an “end of nature” argument reminiscent of misguided “final collapse of capitalism” language employed by O'Connor. Additionally, Harvey believed Foster was using abstract language that was more metaphor than reality. In the *Monthly Review* article entitled “Marxism, Metaphors, and Ecological Politics,” Harvey justifies his critique, wishing to “re-emphasize here my [Harvey's] view that a socialist politics that rests on the view that environmental catastrophe is imminent is a sign of weakness” because it echoes language used by the Ehrlichs and other neo-Malthusians.¹³³ While Harvey does not downplay the significance of ecological harm, he believes weak language prevents a dialectical understanding of ecology required for offering alternatives to the current environmental problems. In response, Harvey reminds the readers of the *Monthly Review* that the environmental collapse he warns of in *The Vulnerable Planet* was not simply a romantic metaphor, but based on a 1992 report by the World Scientists.¹³⁴ Foster explains in a “Rejoinder to Harvey” (published in the *Monthly Review* following Harvey's “Marxism and Metaphors”) that his goal with the *Vulnerable Planet* was to incorporate historical materialism in environmental studies because “a historical materialism that did not embrace environmental issues was - in this day and age - hopelessly inadequate; and that an environmentalism not rooted in historical materialism was hopelessly lost.”¹³⁵

Foster develops his concept of an environmentally rooted historical materialism in a comprehensive text on Marx's relation to ecology a few years later in *Marx's Ecology: Materialism and Nature*.¹³⁶ In the introduction to his book, Foster identifies two main areas of Green thinking: first, the notion that there are natural limits to human expansion, and second, an implicit belief that any subject can be divided between being anthropocentric or eco-centric. But for Foster, neither of these approaches offers concrete solutions for environmental crises because "environmental social theory has not been sufficiently materialist, historical or dialectical."¹³⁷ By tracing the roots of a materialist conception of nature, Foster shows the complexity which exists in understanding the human-nature dialectic, as this relationship is too complicated to be solved through an anti-technological, "return to nature"¹³⁸ approach to environmental crisis. Ecological crisis is not a just technological crisis; it is also a social, historical, political and economic crisis. He argues that the only way to understand the environmental problem at hand is view it in its totality, which is the approach only a Marxist ecology can provide.

These ideas permeate Foster's contemporary work as well, and in many ways, one could read *Marx's Ecology* as becoming the backbone for his later work. Where his ecological work is centered, he often teamed up with other environmental sociologists who regularly publish in the *Monthly Review*,¹³⁹ such as Fred Magdoff, Brett Clark and Richard York for both articles and book-length projects. Foster and Magdoff published *What Every Environmentalist Needs to Know about Capitalism* in 2011, a brief manifesto-like book rejects the idea that a greener version of capitalism can fully mitigate environmental destruction.¹⁴⁰ Magdoff and Foster firmly state that the environmental crisis can only be understood as a function of the current economic structure and that all those concerned with the environment should not rely on scientific advancements to recover the environment.¹⁴¹ A year later Foster, Clark, and York¹⁴² released *The*

Ecological Rift: Capitalism's War on the Earth, an in-depth exploration of the artificial rift capitalism creates between people and their “material-natural” conditions.¹⁴³ Taking aim at technologists and green-tinted capitalists alike, Foster et al. argue that the system which created environmental problems is not capable of repairing them.¹⁴⁴ In doing so, they broaden the theoretical scope beyond *Marx's Ecology* and *What Every Environmentalist Needs to Know*. Both books begin with a section describing our current ecological situation as being at a tipping point, with an environment which is rapidly approach a point where it will become unsuitable for human life.¹⁴⁵ For this reason each text calls for a transition to an “ecological and democratic economy” capable of moving beyond capitalism from within in by resisting the logic of capital.¹⁴⁶

In calling for a renewed focus from cultural critics on the environment, Michelle Yates echoes Foster's theory, explaining the reason for the separation between people and the environment is based on our alienation from labor. The goal of capitalism to require commodities for survival, laborers no longer turn to nature for survival and so the natural environment no longer appears necessary for human survival.¹⁴⁷ To put this in classical Marxist terms, nature becomes an abstraction as it is fetishized by economic practice.¹⁴⁸

One example of Yate's call for a renewed Marxist method in environmental studies can be found in Toby Miller's and Richard Maxwell's latest book *Greening the Media*; a text that links the tools used for digital communication to the offline world via ecological media studies. The authors highlight the pollution and health risks involved in the production of consumer electronics. Referring to Nye's earlier work of the technological sublime, Miller and Maxwell's goal is to “disrupt that technological sublime” of consumer electronics by examining the product lifecycle of electronic goods “with an approach predicated on a deep regard for workers and the

Earth.”¹⁴⁹ Part political economy and part media studies, the text navigates between disciplines to explore the capitalist expansion of communication and electronics market to document the effect on both laborers and the environment. They offer a number of case studies to that end, including one which follows Apple products from the assembly line to the landfill. To combat the expanding ecological damage caused by these products, Toby and Miller call for “a shared commitment to confront the eco-crisis” from global citizens.¹⁵⁰ They believe that only through green citizenship can policy and production be altered in any meaningful way.

5.3 Urban Studies and Ecology

While Foster et al. lean their analysis towards critique without ever offering explicit short-term solutions, other Marxists have approached ecological-focused topics to determine how (or if) there is the potential for helping improvised people. Andrew Ross’s latest book *Bird on Fire: Lessons from the World’s Least Sustainable City* navigates through Arizona to uncover sparks of hope he believes are capable of ultimately converting Phoenix to a “sustainable city.”¹⁵¹ Here, Ross is at home in his role as urban sociologist and he brings his previous work on political economy to a discussion of ecology and urban renewal. One example is Ross’s research into the Federation for American Immigration Reform,¹⁵² who tie themselves to environmental causes. Anti-immigrant groups often reflect a neo-Malthusian argument as they consider both legal and illegal immigrants a threat to limited resources (e.g. jobs, water, or food). According to Ross, this “invites a punitive attitude toward those who are perceived to have the least resources, but whose population is growing the most.”¹⁵³

The other primary focus of the book contains a critique of environmental science. Echoing previous work in *Strange Weather*,¹⁵⁴ Ross’s journalistic-ethnography reveals the way

Arizona city planners attempt to become “sustainable” through calculations rather than direct action. Even well-intentioned city planners create deeply flawed environmental policy, based on technologically myopic theory.¹⁵⁵ In Ross’s interviews with planners, it is evident they rely on the carbon footprint measurements for the basis of many of their decisions. But calculating carbon is only a technological fix with a top-down geo-engineered approach and solutions tend to simply shift the problem from one geographic location to another.

Mike Davis finds Los Angeles city planners behaving in a similar way. In *Ecology of Fear*, he explains that Los Angeles uniquely prone to natural disasters in part because “market driven urbanization” has been allowed to trump “environmental common sense.”¹⁵⁶ In his Marxist critique of urban ecology, Davis outlines how mismanagement of the environment has made the citizens of Los Angeles more vulnerable to fires, floods, earthquakes, tornadoes and a host of other catastrophes. These disasters are “as avoidable, as unnatural, as the beating of Rodney King and the ensuing explosion in the streets.”¹⁵⁷ To prove his point, he unravels the identity of Los Angeles through a series of cultural examinations surrounding the connection between fear, economics, science and the influence each has on public policy. He writes that ecological disasters are easily forgotten and thus their cost to both property and life are unnecessarily high. Davis uses the term “disaster amnesia” to describe the willingness of citizens or businesses to bypass empirical evidence and quickly allow natural disasters to fade from memory.¹⁵⁸ Rather than learn from natural disasters and use them as a springboard for environmental changes, the city planners are more apt to develop ineffective short-term goals foster to economic gain.

Summation

By the turn of the 20th century, scholars and policy-makers fell into two camps with different conceptions of nature. The first camp based their theories and environmental goals on a notion of conservation that conceived of the environment as a *resource*. Responsible land use was determined by land managers to ensure the land remained a productive source of profit. The second camp consisted of those who viewed nature as an *absolute value* with an almost mystic quality. For them, nature should be preserved for its own sake to provide places beyond human control, allowing a place for everyone to experience nature. This split continued into the middle of the 20th century, even as the environmental degradation associated with an industrialized economy had become well documented and scientists had begun to recognize the fragility of the natural environment. In response, some scholars argued for a limit to either population or economy, while others began to focus on the economic system itself as the source of environmental issues. The emergence of a Marxist-oriented ecology in the early 1970s soon split into a variety of directions – giving birth to myriad social critiques of environmental degradation. The split between nature as an *absolute value* and as a *resource* remained though it became expressed in more complex ways as scholars began to assign non-monetary value to nature. Rachel Carson, for example, valued nature as a source of human health, which is a resource, though not economic in the traditional sense. Marxists, political ecologists, and other scholars began to focus on environmental justice issues conceive of natural resources as a requirement for healthy human life. At their core, these disciplines believe there are enough natural resources to provide for both the current population and account for population growth – provided society finds a way to use resources in socially responsible ways. On the other hand, those that view nature as an absolute value are represented by a spectrum of beliefs, from the Deep Ecology

movement based on a quasi-religious relationship to nature to neo-Malthusians who see human population growth as incompatible with the natural world. As well as assigning an absolute value to nature, these writers define *nature* in a static way, and do not subscribe to any theories which dictate that nature is a socially determined concept.

Cultural Studies plays an important role within ecology precisely because the discipline does understand nature to be socially determined and is therefore capable of breaking apart the contradiction between the needs of a capitalist market system and the human requirement for a life-sustaining environment. Though the field consists of many disparate academic headings, this document has attempted to construct the field in a somewhat linear fashion to show the evolution of conceptions of nature and how scholars from a variety of fields wrestle with the social and ecological requirements of capitalism. The current trends in this field continue to question consumerism, the environment, with particular attention being paid to the relationship between poverty and the environment.

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¹ Tim Forsyth, *Critical Political Ecology : The Politics of Environmental Science*. (London; New York: Routledge, 2003), 1.

² E. F. Schumacher, *Small Is Beautiful: Economics as If People Mattered* (New York, N.Y: Harper Perennial, 2010).

³ W. T. S. Gould, *Population and Development*. Routledge Perspectives on Development. (London ; New York: Routledge, 2009), 14; Also, Amartya Sen, “Food, Economics, and Entitlements” in *The Political Economy of Hunger: Volume 1: Entitlement and Well-being, Volume 1*. Eds. Drcze, Jean and Amartya Sen. (Oxford 1991) 35. Sen points out that due to the inaccuracy of Malthus’ calculations on the amount of food produced per person, in some food-deprived areas have delayed what might have been helpful policy, because calculations were written off as being “Malthusian.”

⁴ Michael Perelman, *The Invention of Capitalism: Classical Political Economy and the Secret History of Primitive Accumulation* (Durham, N.C: Duke University Press, 2000), 1.

⁵ Perelman, *The Invention of Capitalism*, 5.

⁶ *Ibid.*, 2.

⁷ David Ricardo, *The Principles of Political Economy and Taxation*. 3rd ed. (London: John Murray, Albemarle-Street, 1821), i.

⁸ Ricardo, *Principles of Political Economy*, ii.

⁹ Hans Aage, “Economic Ideology About the Environment. From Adam Smith to Bjørn Lomborg.” *Global Environment: A Journal of History and Natural and Social Sciences* 1, no. 2 (2008): 8 – 45, 2.

¹⁰ Thomas Malthus, *An Essay on the Principle of Population*. (Electronic Scholarly Publishing Project, 1798), <http://129.237.201.53/books/malthus/population/malthus.pdf>, 4.

¹¹ David Layfield, *Marxism and Environmental Crises* (Bury St. Edmunds: Arena, 2008).

¹² Layfield explains Marx’s critique of Malthus in *Marxism and Environmental Crisis*: in both the *Grundrisse* and *Capital* Marx argues that poverty was neither a subsistence issue nor a “natural” issue, but a problem created by capitalism. Also see John Bellamy Foster’s *Marx’s Ecology* for more information on the same subject.

¹³ Karl Marx, “Economic and Philosophic Manuscripts of 1844” Tucker, Robert C., ed. *The Marx-Engels Reader*. 2nd ed. (New York: Norton, 1978).

¹⁴ Karl Marx, *Capital Vol. I: a Critique of Political Economy*. Edited by Mendel (London; New York, N.Y.: Penguin Books in association with *New Left Review*, 1981).

¹⁵ Marx, *Capital Vol. I*, 875.

¹⁶ Ibid.

¹⁷ Adam Smith, *An Inquiry Into The Nature And Causes of the Wealth of Nations*. Edited by Jim Manis. The Electronic Classics Series, n.d. <http://www2.hn.psu.edu/faculty/jmanis/adam-smith/wealth-nations.pdf>. Also quoted in Perelman, *Invention of Capitalism*, 1.

¹⁸ Perelman, *Invention of Capitalism* 25-26. Also in Marx and Engels 1973, 33: 741.

¹⁹ Marx, Karl. *Capital Vol. I*, 307.

²⁰ John Bellamy Foster, Paul Burkett, Ted Benson, David Harvey and others attach various levels of significance to the concept of *metabolism*. The term took on a significant importance for Foster, who referred to the concept as *metabolic rift*, which can be broadly describe as one of the effects of a capitalist mode of production on soil fertility. In the third volume of *Capital* Marx's describes this rift as an "irreparable rift in the interdependent process of social metabolism." Karl Marx, *Capital, vol. III* (New York: Vintage, 1981), 949.

²¹ John Bellamy Foster, *Marx's Ecology : Materialism and Nature* (New York: Monthly Review Press, 2000), 141.

²² Marx, *Capital Vol. I*, 283; also quoted in Foster, *Marx's Ecology*, 141.

²³ Justus von Liebig was a German agricultural chemist who published *Organic Chemistry in Its Applications to Agriculture and Physiology* in 1840 that connected nutrients in soil to plant health. He described biochemical processes within nature which Marx referred to as a metabolism.

²⁴ Foster. *Marx's Ecology*, 91.

²⁵ John Bellamy Foster, "Capitalism and Ecology." *Monthly Review* 54, no. 4 (September 2002). <http://monthlyreview.org/2002/09/01/capitalism-and-ecology>.

²⁶ Karl Marx, *Capital: a Critique of Political Economy, vol. 2* . (London: Penguin, 1978).

²⁷ Foster, *Marx's Ecology*, 146.

²⁸ Quoted in Vaillancourt, Jean-Guy, "Marxism and Ecology: More Benedictine Than Franciscan," In *The Greening of Marxism, Democracy and Ecology*, Ted Benton, ed., (New York: Guilford Press, 1996), 52.

²⁹ Foster. *Marx's Ecology*, 91.

³⁰ Frederick Engels, *The Condition of the Working Class in England* (New York: Panther Edition, 1969, from text provided by the Institute of Marxism-Leninism, Moscow, 1887). <http://www.marxists.org/archive/marx/works/1845/condition-working-class/>

³¹ Engels, Fredrick. *Dialectics of Nature*. Translated by Sally Ryan, <http://www.marxists.org/archive/marx/works/1883/don/index.htm>. Chapter II Dialectics, also Socialism: Utopian and Scientific <http://www.marxists.org/archive/marx/works/1880/soc-utop/ch02.htm>.

³² Ibid.

³³ William Morris, "News from Nowhere: or An Epoch of Rest Being Some Chapters From a Utopian Romance," *Marxists.org*, <http://www.marxists.org/archive/morris/works/1890/nowhere/nowhere.htm>.

³⁴ Ibid.

³⁵ Florence Boos, "An Aesthetic Eco-communist: Morris the Red and Morris the Green." In *William Morris: Centenary Essays: Papers from the Morris Centenary Conference Organized by the William Morris Society at Exeter College Oxford, 30 June-3 July 1996*, edited by Peter Faulkner and Peter Preston (Exeter, UK: University of Exeter Press, 1999), 22.

³⁶ Henry David Thoreau's *On Walden Pond*, and Ralph W. Emerson were American Romantic writers who constructed nature as a universal concept. The Romantic movement emerged in part as a reaction to the growing industrialization of the United States.

³⁷ The Hudson River School art movement depicted American pastoral settings during the mid-19th century. Thomas Cole, Frederic Church, John Knsett and others captured landscapes and pastoral images.

³⁸ In Muir's description of the differences between a mountain goat's wool and a domesticated goat's wool, he captures the sublimity of nature. For Muir nature is authentic, and this authenticity must be protected against any action that seeks to destroy it. On the other hand, Pinchot was more of a pragmatist who believed natural resources should be managed so they were not entirely depleted.

³⁹ John Muir, *My First Summer in the Sierra: And Selected Essays* (New York: Library Of America, 2011).

⁴⁰ The U.S. Park service was created as to build recreational space for U.S. citizens as much as it was for economic land management, in contrast the Reclamation projects that were solely designed to manage water and make the West viable for agriculture and development.

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- ⁴¹ Gifford Pinchet. *Breaking New Ground* (Washington, D.C.: Island Press, 1998), 505.
- ⁴² Karl Polanyi, *The Great Transformation* (Beacon Press, 1944), 178.
- ⁴³ Ibid.
- ⁴⁴ Ibid., 179.
- ⁴⁵ J. E. T. Eldridge, *Raymond Williams: Making Connections* (London; New York: Routledge, 1994), 177.
- ⁴⁶ Raymond Williams, *The Country and the City* (Oxford University Press, 1975), 2.
- ⁴⁷ Williams, *The Country and the City*, 11.
- ⁴⁸ Ibid.
- ⁴⁹ Ibid.
- ⁵⁰ Williams makes the argument that each generation looks back with nostalgia at earlier periods in relation to the land – placing in the origin of the nostalgia with Eve taking a bite of the poisoned apple.
- ⁵¹ Ibid.
- ⁵² Ibid., 37.
- ⁵³ Ibid.
- ⁵⁴ Ibid.
- ⁵⁵ Ibid., 288.
- ⁵⁶ Eldridge, *Raymond Williams: Making Connections*, 196.
- ⁵⁷ Jeffrey Meikle, “Leo Marx's ‘The Machine in the Garden.’” *Technology and Culture*, Vol. 44, No. 1 (Jan., 2003), 147-159.
- ⁵⁸ *Technological Sublime* was a term coined by Perry Miller, though Nye is most likely borrowing the term from Leo Marx, whom he studied under at the Massachusetts Institute of Technology.
- ⁵⁹ Rachel Carson, *Silent Spring* (Boston: Houghton Mifflin, 2002), 13.

⁶⁰ Garrett Hardin, “The Competitive Exclusion Principle,” *Science* 131, no. 3409 (April 29, 1960): 1292.

⁶¹ *Ibid.*

⁶² *Ibid.*, 1293.

⁶³ *Ibid.*, 1295.

⁶⁴ *Ibid.*, 1296.

⁶⁵ *Ibid.*

⁶⁶ Garrett Hardin, “The Tragedy of the Commons.” *Science* 162, no. 3859 (December 13, 1968): 1244.

⁶⁷ *Ibid.*, 1246.

⁶⁸ *Ibid.*, 1247.

⁶⁹ *Ibid.*, 1248.

⁷⁰ *Ibid.*

⁷¹ The Gaia hypothesis, or Gaia theory, was formulated in “Atmospheric homeostasis by and for the biosphere: the Gaia hypothesis” by James Lovelock and Lynn Margulis in 1974. The theory states that the earth’s interconnected ecosystems might behave as a single organism. The paper examined the stability of the atmosphere in relation to changing radiation levels over the course of the existence of Earth. They offer a theory that rather than create conditions for life, the atmosphere became “a component part of the biosphere rather than as a mere environment for life. In this new context the incompatibilities of biological cycles and inorganic equilibria are seen as more apparent than real.” See James Lovelock and Lynn Margulis, “Atmospheric Homeostasis by and for the Biosphere: The Gaia Hypothesis,” *Tellus XXVI* (1974), <http://www.jameslovelock.org/page34.html>, 1-2.

⁷² “Spaceship Earth” was the description used by Adlai Stevenson in 1965 in a speech to the United Nations Economic and Social Council. Stephenson described the global connection between people: “We travel together, passengers on a little space ship, dependent on its vulnerable reserve of air and soil; all committed for our safety to its security and peace; preserved from annihilation only by the care, the work, and I will say, the love we give our fragile craft.” See Adlai Stevenson, “Strengthening the International Development Institutions” (United Nations, July 9, 1965), http://www.adlaitoday.org/articles/connect2_geneva_07-09-65.pdf. After the speech was made public, three economists used the phrase “Spaceship Earth” in various papers in 1965 to describe resource limitation. See R. Buckminster Fuller, *Operating Manual for Spaceship Earth* (Baden, Switzerland: Lars Müller Publishers, 2008); Kenneth

Boulding, “The Economics of the Coming Spaceship Earth” (presented at the Sixth Resources for the Future Forum on Environmental Quality in a Growing Economy, Washington, D.C., March 8, 1966). Both of these texts worked through scenarios related to increased population demand on limited resources such as oil, food, and water.

⁷³ The club of Rome was founded in 1968 as an informal group who, according to the organization’s website (www.clubofrome.org) “came together to discuss the dilemma of prevailing short-term thinking in international affairs and, in particular, the concerns regarding unlimited resource consumption in an increasingly interdependent world.” See “The Story of the Club of Rome,” *The Birth of the Club of Rome: A Quiet Villa and a Big Bang*, accessed December 11, 2013, <http://www.clubofrome.org/?p=375>.

⁷⁴ Donella Meadows, ed. *The Limits to Growth; a Report for the Club of Rome’s Project on the Predicament of Mankind* (New York: Universe Books, 1972).

⁷⁵ World3 was the software developed by MIT to predict future population and scarcity models.

⁷⁶ Meadows, *Limits to Growth*.

⁷⁷ Graham Turner, *A Comparison of the Limits to Growth with Thirty Years of Reality*. Socio-Economics and the Environment in Discussion, CSIRO Working Paper Series 2008-09, Commonwealth Scientific and Industrial Research Organization, June 2008, <http://www.csiro.au/files/files/plje.pdf>, 2.

⁷⁸ Paul Ehrlich, and Anne Ehrlich, *The Population Bomb*. (Cutchogue, N.Y.: Buccaneer Books, 1995), xii.

⁷⁹ *Ibid.*, 4.

⁸⁰ Ehrlich and Ehrlich, *The Population Bomb*, 18.

⁸¹ See Paul Ehrlich and Anne Ehrlich, “The Population Bomb Revisited,” *The Electronic Journal of Sustainable Development* 1, no. 3 (2009): 63 – 71.

⁸² Barry Commoner, *The Closing Circle; Nature, Man, and Technology* (New York: Bantam Books, 1972)188.

⁸³ Paul Ehrlich and John Holden, “A Bulletin Dialog Critique,” *The Bulletin of Atomic Scientists*, 28/5 (May 1972), 16.

⁸⁴ *Ibid.* 16.

⁸⁵ *Ibid.* 27.

⁸⁶ Julian Morris articulates the logical critique his article “The Persistence of Pessimism.” Discussion Ehrlich and Holdren’s critique of Commoner, he states that Ehrlich and Holdren built “the now-famous I = P.A.T identity, where affluence (A) and technology (T) now replaced the broader vector of factors (F). Their purpose was to challenge Commoner’s contention that modern technology was the main driver of environmental damage. Commoner responded: “Ehrlich is so intent upon population control as to be unwilling to tolerate open discussion of data that might weaken the argument for it.” Julian Morris, “The Persistence of Population.” *The Electronic Journal of Sustainable Development*, 1 (3, Summer 2009). http://epsem.erin.utoronto.ca/desrochers/The_Population_Bomb.pdf.

⁸⁷ Barry Commoner, “The Closing Circle: Response,” *The Bulletin of Atomic Scientists* 28/5 (May 1972), 18.

⁸⁸ *Ibid.*, 51.

⁸⁹ Ernst Friedrich Schumacher’s *Small is Beautiful*, an essay collection published in 1973, argued that the capitalist drive for an ever-increasing economy was unsustainable. He called for people to turn towards a locally focused economy rather than suffer the dehumanizing effects of unmitigated technology. E. F Schumacher, *Small Is Beautiful: Economics as If People Mattered* (New York, N.Y: Harper Perennial, 2010).

⁹⁰ Murray Bookchin, “Social Ecology Versus Deep Ecology: A Challenge for the Ecology Movement.” *Libcom.org*, <http://libcom.org/library/social-versus-deep-ecology-bookchin>. Originally published in “Green Perspectives: Newsletter of the Green Program Project,” nos. 4-5 (summer 1987).

⁹¹ Murray Bookchin, *The Ecology of Freedom: The Emergence and Dissolution of Hierarchy* (Oakland, CA: AK Press, 2005).

⁹² One of Janet Biehl’s colleagues at the Institute for Social Ecology in Vermont, Chaia Heller focuses on feminist and environmental issues in *Ecology of Everyday Life: Rethinking the Desire for Nature*. Francoise d’Eaubonne and Barbara Holland-Cunz were also pioneers in eco-feminism during this time. Chaia Heller, *Ecology of Everyday Life: Rethinking the Desire for Nature* (Montréal: Black Rose Press, 1998).

⁹³ Janet Biehl, *Rethinking Ecofeminist Politics* (Boston: South End Press, 1991) 1-3.

⁹⁴ Ted Benton, *The Greening of Marxism* (New York: Guilford Press, 1996), 157.

⁹⁵ Chris Williams, *Ecology and Socialism: Solutions to Capitalist Ecological Crisis* (Chicago: Haymarket Books, 2010).

⁹⁶ David Layfield, *Marxism and Environmental Crises* (Bury St. Edmunds: Arena, 2008), 24.

⁹⁷ *Ibid.*

⁹⁸ Ibid., 26.

⁹⁹ J John Bellamy Foster, "Capitalism and Ecology: The Nature of the Contradiction," *Monthly Review* 54, no. 4 (September 2002), <http://monthlyreview.org/2002/09/01/capitalism-and-ecology>.

¹⁰⁰ James O'Connor, "The Second Contradiction of Capitalism," In *The Greening of Marxism*, ed Ted Benton (New York: Guilford Press, 1996), 199.

¹⁰¹ O'Connor, "The Second Contradiction of Capitalism," 202.

¹⁰² Karl Marx, *Grundrisse: Foundations of the Critique of Political Economy* (London; New York: Penguin Books, 1993), Notebook V, 22 January 1858 - Beginning of February 1858, continued "Exchange of labour for labour rests on the worker's propertylessness"

¹⁰³ O'Connor, "The Second Contradiction of Capitalism," 188.

¹⁰⁴ Ibid.

¹⁰⁵ Benton, *The Greening of Marxism*. 188.

¹⁰⁶ O'Connor, "The Second Contradiction of Capitalism," 215.

¹⁰⁷ Foster, "Capitalism and Ecology."

¹⁰⁸ Victor Toledo, "The Ecological Crisis: A Second Contradiction of Capitalism." In *The Greening of Marxism*, ed Ted Benton (New York: Guilford Press, 1996).

¹⁰⁹ Benton, *The Greening of Marxism*, 205.

¹¹⁰ Ibid.

¹¹¹ Enrique Leff, "A Second Contradiction of Capitalism: Notes for the Environmental Transformation of Historical Materialism." In *The Greening of Marxism*, Ted Benton ed., translated by Ruth MacKay (New York: Guilford Press, 1996), 228.

¹¹² Ibid.

¹¹³ Foster, "Capitalism and Ecology"

¹¹⁴ Neil Smith, *Uneven Development: Nature, Capital, and the Production of Space* (Athens: University of Georgia Press, 2008), 368.

¹¹⁵ Smith, *Uneven Development*, 1.

¹¹⁶ David Harvey, "Population, Resources, and the Ideology of Science." *Economic Geography* 50, no. 3 (July 1974): 256 – 277, 256.

¹¹⁷ Donna Haraway, "A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century," in *Simians, Cyborgs and Women: The Reinvention of Nature* (New York; Routledge, 1991), 149-181.

¹¹⁸ Haraway, "A Cyborg Manifesto", 150.

¹¹⁹ Geography is a key factor in delineating political ecology projects. Therefore many writers who set out to employ a "political ecology" method cite Jillian Steward's work on cultural ecology. The term "Cultural Ecology" was originally used in Steward's *Theories of Cultural Change*. Steward analyzed the relationship between environment and culture to understand how the two shaped each other and resulted in cultural evolution. He determined that culture could not be separated into stages, which each culture following a similar stage nor was did the environment explicitly produce a particular type of culture. Therefore this early anthropological work was somewhat of a founding text to contemporary anthropologists examining poverty in the developing world. Julian Haynes Steward, *Theory of Culture Change : The Methodology of Multilinear Evolution* (Urbana; London: University of Illinois P, 1972).

¹²⁰ Stuart Franklin, "Political ecology of vulnerability," Stockholm Environmental Institute. Poverty and Vulnerability Programme, GEKAFS Project, www.gecafs.org/publications/Publications/Political_ecology_brief.PDF.

¹²¹ Enrique Leff, "Political Ecology - A Latin American Perspective," in *Culture, Civilization and Human Society*, ed. UNESCO-EOLSS Joint Committee (Eolss Publishers, Oxford, UK, 2012). 1.

¹²² Bahro was on the executive board of the German Green Party from 1982 to 1984.

¹²³ Mark Whitehead, *Spaces of Sustainability: Geographical Perspectives on the Sustainable Society*, (Routledge: London, 2007).

¹²⁴ Benton, *The Greening of Marxism*, 11.

¹²⁵ Donald Moore, "Marxism, Culture, and Political Ecology: Environmental struggles in Zimbabwe's Easter Highlands" in *Liberation Ecology*, Eds Richard Peet and Michael Watts, (Routledge: London, 2002).

¹²⁶ Michael Watts and Richard Peet, *Liberation Ecologies: Environmental, Developments, Social Movements* (London: Routledge, 2004), 7.

¹²⁷ *Ibid.*, 15.

¹²⁸ Piers Blaikie and H. C Brookfield, *Land Degradation and Society* (London; New York: Methuen, 1987); also quoted in Peet and Watts, *Liberation Ecology*, 7.

¹²⁹ Peet and Watts, *Liberation Ecology*, 16.

¹³⁰ Moore, "Marxism, Culture, and Political Ecology," 7.

¹³¹ Lakshman Yapa, "Improved Seeds and Constructed Scarcity" in *Liberation Ecology*, Eds Richard Peet and Michael Watts (Routledge: London, 2002), 69.

¹³² Yapa, "Improved Seeds and Constructed Scarcity," 72.

¹³³ David Harvey "Marxism, Metaphors, and Ecological Politics." *Monthly Review* 49, no. 11 (April 1998), 17.

¹³⁴ The "1992 World Scientists' Warning to Humanity" was a report issued in November of 1992, spearheaded by Henry Kendall, a former chair of the Union of Concerned Scientists and physicist at MIT. According to the Union of Concerned Scientists website (www.ucsusa.org/), the report was endorsed by "some 1,700 of the world's leading scientists, including the majority of Nobel laureates."

¹³⁵ John Bellamy Foster, "Rejoinder to Harvey," *Monthly Review: An Independent Socialist Magazine* (April 98, 49/1), 1.

¹³⁶ Foster, *Marx's Ecology*.

¹³⁷ *Ibid.*, 17.

¹³⁸ The "return to nature" mentality is exemplified by the Deep Ecology movement. According to founding member Alan Drengson, the group advocates a rejection of the industrial development model and endorses "principles [that] leads us to attend to the "ecosophies" of aboriginal and indigenous people so as to learn from them values and practices that can help us to dwell wisely in the many different places in this world." Alan Drengson, "Some Thoughts on the Deep Ecology Movement," *Foundation for Deep Ecology*, accessed December 2, 2011, <http://www.deepecology.org/deepecology.htm>.

¹³⁹ John B. Foster is the editor of the Monthly Review. Fred Magdoff is the son of a previous editor, Harry Magdoff.

¹⁴⁰ Magdoff, Fred, and John Bellamy Foster. *What Every Environmentalist Needs to Know About Capitalism : a Citizen's Guide to Capitalism and the Environment*. New York: Monthly Review Press, 2011.

¹⁴¹ *Ibid.*, 30.

¹⁴² Foster and York work together at the University of Oregon's Sociology department. Foster served as Clark's dissertation advisor while a Ph.D. student at University of Oregon.

¹⁴³ John Bellamy Foster, *The Ecological Rift: Capitalism's War on the Earth* (New York: Monthly Review Press, 2010), i.

¹⁴⁴ Jason Moore has argued that Foster, Clark, and York do not take the metabolic rift theory "far enough," stating that the authors setup a false dialectical binary locating the ecological crisis on one side and capital crisis in another. According to Moore, if the dialectal relationship is constructed the way Foster, Clark, and York claim, they present ecological crisis as an *output* of capitalism, rather than *part of* capitalism. See Jason Moore, "Transcending the Metabolic Rift: a Theory of Crises in the Capitalist World-ecology." *Journal of Peasant Studies* 38, no. 1 (January 2011): 1–46. doi:10.1080/03066150.2010.538579.

¹⁴⁵ Ibid.

¹⁴⁶ Magdoff and Foster, *What Every Environmentalist Needs to Know*, 195.

¹⁴⁷ Yates, Michelle. "Towards a Green Marxist Cultural Studies: Notes on Labor, Nature, and the Historical Specificity of Capitalism." In *The Renewal of Cultural Studies*, ed. Paul Smith (Temple University Press) 2011, 241.

¹⁴⁸ Ibid., 242.

¹⁴⁹ Maxwell, Richard, and Toby Miller. *Greening the Media* (New York: Oxford University Press, 2012) 89.

¹⁵⁰ Miller and Maxwell, *Greening the Media*, 135.

¹⁵¹ Andrew Ross, *Bird on Fire: Lessons from the World's Least Sustainable City* (Oxford, New York: Oxford University Press, 2011), 2.

¹⁵² The Federation for American Immigration Reform is an anti-immigration group founded by John Tanton and wraps itself in "green" language to support its agenda of immigration reduction and deportation. Essentially, it's a rehashing of Neo-Malthusian logic meshed within the context of immigration.

¹⁵³ Ross, *Bird on Fire*, 201.

¹⁵⁴ Andrew Ross, *Strange Weather: Culture, Science, and Technology in the Age of Limits*. (The Haymarket Series. London; New York: Verso), 1991.

¹⁵⁵ Ibid.

¹⁵⁶ Mike Davis, *Ecology of Fear: Los Angeles and the Imagination of Disaster* (New York: Vintage Books, 1999), 9.

¹⁵⁷ Ibid.

¹⁵⁸ Mike Davis, *City of Quartz : Excavating the Future in Los Angeles* (London; New York: Verso, 2006), 47.