Toward a Healthy Planet

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Edited by

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We dedicate this book to Duquesne University in tribute to the Endowed Annual Conference Series on the Integrity of Creation.

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INTRODUCTION

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In 2015, the President of Duquesne University in Pittsburgh in the United States (Charles J. Dougherty) commissioned an endowed annual academic conference series on the *Integrity of Creation* to celebrate the organization's Spiritan mission. The University is Catholic, being founded by members of the Congregation of the Holy Spirit, the Spiritans.[1] The current University President, Ken Gormley, continues to provide outstanding support for the conference, inspiring excellence as the series develops.

This conference series addresses emerging concerns and pivotal problems about our planet's environment and ecology, including this study, *Toward a Healthy Planet*. Each conference is an interdisciplinary endeavor in the sense that presenters and participants from different disciplines are invited to engage each other in civil discourse on the selected topic. The conference has three goals: to provide a scholarly opportunity to engage with established and emerging research; to foster interdisciplinary discourse; and, to enlighten public awareness and discussion on the selected issues.

In Fall 2015, the topic of the inaugural conference was *Climate Change* as an urgent concern regarding the Integrity of Creation.[2] Before the conference occurred, there was the publication in May 2015 of the environmental encyclical of Pope Francis, *Laudato Si'*: *Praise Be To You. On Care for Our Common Home*.[3] The Pope invited "every person living on this planet," "all people of good will," "to enter into dialogue with all people about our common home" as "a shared inheritance."[4] The call of Pope Francis to foster a "respect for the Integrity of Creation" is very similar to the focus of the Spiritan mission.[5] The second annual conference and its proceedings focused on the topic of *Integral Ecology: Protecting our Common Home*,[6] the conference title being inspired by a chapter in the encyclical of Pope Francis.[7] The third annual conference and its proceedings focused on the topic of *The Global Water Crisis*,[8] again inspired by the encyclical of Pope Francis.[9] The fourth annual conference and its proceedings focused on, *The Global Sustainability Challenge*, reflecting the recognition of the Earth Charter by Pope Francis in his

encyclical.[10] The fifth annual conference and its proceedings continue the same approach in this volume, *Toward a Healthy Planet*.

As this conference series evolves, many other topics will be discussed to shed light on the *Integrity of Creation* from multiple perspectives. To safeguard our planet, we must be attentive to environmental concerns with air pollution, problems that arise from toxicity in the land and ocean regarding food sources and biodiversity, and many other crises, not least of which is how to anticipate the movement of vast populations from coastal regions that may become permanently flooded. These topics all highlight the basic problem of global sustainability.

The presentations at the conferences result from a peer-reviewed process for inclusion at the conference and in these published proceedings. The book chapters reflect the conference presentations and have been written to appeal to a general audience with rigorous scholarship, depicting the interdisciplinary focus of the discussions. The chapters are organized into several disciplines and categories that relate together in an integral manner. Each section is designed to present a wide variety of perspectives: context, vision for a healthy planet, agriculture and food, health and the environment, global issues, and generational perspectives.

The first section sets the *context* for the discussion on making progress toward a healthy planet, providing an overview of the various arguments and indicating a cumulative sense of urgency. This section considers the Anthropocene and academic disciplines as well as the connection between sociology and ecology, bridging science with action.

The next section presents a *vision for a healthy planet* by considering how we can find common ground for a moral vision of the good society as well as how we can protect the rights of the living earth. The subsequent section discusses *agriculture and food* to consider not only the relation between food security, industrialized agriculture, and the changing global climate but also the dramatic significance of the food asset potential. The following section examines *health and the environment* to explain how the US healthcare industry impacts the environment, to explore antibiotic abuse and bacteriophage misrepresentation, and to consider the ethical significance of lead toxicity on child development. The next section on *global issues* scrutinizes pivotal topics that are crucial for a healthy planet: considering the impact of integral ecology on research priorities in Haiti; and engaging issues related to the Niger Delta Region, such as sustainable development and African traditional environmental ethics. Finally, there is a section on *generational perspectives* that introduces a variety of student voices to discuss the contribution of passive homes to the environment, how the reduction of plastic is necessary to heal the planet, and the effects of human

activities on climate change. The brief *conclusion* describes the need to work toward a healthy planet as an urgent ethical imperative.

A few words of acknowledgment are appropriate to recognize the contribution of many in planning the annual conference series that has led to this collection of conference proceedings. Above all, the establishment of an endowment by President Charles J. Dougherty at Duquesne University to support this annual academic conference series presents a lovely legacy. Also, there is sincere appreciation for the continuing support of Ken Gormley as our current University President and for the ongoing support of the Spiritan Congregation that sponsors the University. The editors are very grateful for the meticulous work of a highly dedicated Conference Planning Committee, an outstanding University librarian, Ted Bergfelt, and a superb support staff, including a very gifted group of international graduate students and Ercan Avci, Ph.D. who provides outstanding administrative support for the annual conference that leads to our published proceedings. Finally, the extraordinary grace and talent of the conference coordinator, Glory Smith, deserves to be recognized with high acclaim and heartfelt gratitude: this outstanding commitment, in addition to all of her other daily office duties, continues to be a labor of love that assures success and joy at each conference.

Notes

[1] See, http://www.duq.edu/about/mission-and-identity; also see, http://www.spiritans.org.

[2] See the conference proceedings, Gerard Magill, Kia Aramesh, eds., *The Urgency of Climate Change* (Newcastle Upon Tyne, UK: Cambridge Scholars Publishing, 2017), Introduction, xi-xiv. Permission has been provided to reiterate in the Introduction of this book materials from the Introduction to the first book in this series, *The Urgency of Climate Change*.

[3] Pope Francis, *Laudato Si': Praise Be To You. Encyclical Letter of the Holy Father Francis on Care for Our Common Home* (Vatican City: Libreria Editrice Vaticana, 2015).

[4] Pope Francis, *Laudato Si'*, no. 3, 28, 93.

[5] Pope Francis, *Laudato Si'*, no. 130.

[6] See the conference proceedings, Gerard Magill, Jordan Potter, eds., *Integral Ecology: Protecting Our Common Home* (Newcastle Upon Tyne, UK: Cambridge Scholars Publishing, 2018).

[7] Pope Francis, *Laudato Si'*, no. 124 (in chapter three), and chapter four.

[8] See the conference proceedings, Gerard Magill, James Benedict, eds., *Cascading Challenges in the Global Water Crisis* (Newcastle Upon Tyne, UK: Cambridge Scholars Publishing, 2019).

[9] Pope Francis, *Laudato Si'*, chapter 1, section II, "The Issue of Water," no. 27-31.

[10] See the conference proceedings, Gerard Magill, James Benedict, eds., *The Global Sustainability Challenges* (Newcastle Upon Tyne, UK: Cambridge Scholars Publishing, 2020). Also, see, Pope Francis, *Laudato Si'*, no. 207, refers to the *Earth Charter* for a sustainable, global society that emphasizes justice and peace (The Hague, 29 June 2000, at https://earthcharter.org/discover/what-is-the-earth-charter).

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CHAPTER ONE

PIVOTAL PERSPECTIVES ON WORKING TOWARD A HEALTHY PLANET

GERARD MAGILL

Introduction

This book was completed in the wake of yet another landmark report about planetary health. The International Energy Agency urgently documented the need to immediately stop the approval of new coal-fired power plants as well as new oil and gas fields. The report provides a detailed road map for global action to slash carbon dioxide emissions to net-zero by 2050 – that goal is crucial if we are to prevent the average global temperature from increasing beyond 1.5 celsius above preindustrial levels.[1] This report adds urgency to the Sustainable Development Goals adopted by the United Nations Development Programme in 2015,[2] and presents a haunting context for the discussions in this book.

Building on these events, the book presents the proceedings of the 5th annual endowed conference on the Integrity of Creation, fostering the wholeness of creation from interdisciplinary perspectives. This 5th annual conference selected the topic, *Toward a Healthy Planet*. The perspectives in the study represent a variety of disciplines that engage each other in an integrative way. The chapters have been organized to let the dialogue unfold in an overlapping manner, with points of view developing from different angles.[3] The sections below summarize crucial standpoints as we seek to protect our common home. As mentioned in the book's Introduction, there are several main sections to bring coherence to the contributions. The first section introduces the context of the book and the subsequent sections present different standpoints on developing a vision for a healthy planet, on agriculture and food, on health and the environment, on global issues, and on generational perspectives.

Context

The opening chapter provides an overview of the multi-disciplinary perspectives regarding working toward a healthy planet that appear in the book (using the abstracts submitted by the various contributors).[4] This overview is designed to assist readers in keeping an eye on the big picture as they explore the various topics. As the chapters develop, there is a cumulative sense of seeking a healthy planet as a function of the common good belonging to all and meant for all (adopting a phrase from the Papal encyclical, *Laudato Si'*).[5]

In this first section on context, the contributions provide two inter-related perspectives. On the one hand, there is a discussion of the Anthropocene and academic disciplines. The chapter discusses the challenges and advantages of integrating disciplinary insights in environmental policy research. The nature of environmental problems necessarily focuses on the intertwining of humans and their sociocultural systems with those other-than-human systems from micro-biotic to planetary geologic processes. Recognition of mutual influence among these human and other-than-human systems is a hallmark of work on the environment across academia. This presents a view of the natural world and the social world as fundamentally part of common community. This view of the ecosystem can provide the basis to link the distinct areas of inquiry found in sciences, humanities, social sciences, and professions. This common worldview can provide a solid basis to understand and address critical environmental problems emerging in the Anthropocene. On the other hand, there is a discussion of sociology and ecology, bridging science and action. This chapter examines the critical role that sociology plays in analyzing the relationship between humans and the planet. The detrimental effects of anthropogenic pollution resulting from expansive human production in Industrial Capitalism are starting to tip the scale away from a safe operating space for planetary balance. Unaddressed, these detrimental effects will trigger an irreversible chain reaction. However, not all global citizens appreciate the problem. Alternative climate narratives are pushed through disinformation campaigns by big corporations and political interests that rely on and reinforce unsustainable business practices for profit. In order to preserve and maintain a balanced and respectful relationship with the earth, we must be sensitive towards the earth's vital signs and "planetary boundaries." Hope for humanity, and indeed for the Planet itself, requires global solidarity and sustainable development.

Vision for a Healthy Planet

The second section of the book discusses the development of a vision of a healthy planet. One author discusses finding common ground on a moral vision for the good society. This splendid planetary home brings forth life abundant, even out of death. Life arising from death and destruction is Earth's song of hope and God's song of justice-seeking, Earth-relishing love. Societies reshaped toward the great shalom in which all people have the necessities for life with justice and joy while Earth's eco-systems flourish, is the heart of a great moral vision. According to this moral vision, people will strive to transform unjust or exploitative social structures into structures that foster justice, compassion, healing, joy, and ecological sanity. Much must transpire for this moral vision to be authentic in the 21st-century context of climate catastrophe and climate colonialism. Identifying that work is the task of this chapter. Another author then engages protecting the rights of the living earth. Fifty years ago, on July 20, 1969, Neil Armstrong set foot on the moon, marking the first time humans had stepped out in space: 'One small step for a man, one giant leap for mankind.' The iconic images of our fragile blue planet spinning in the vast reaches of space cemented the perception of Earth as our only home. This giant leap in perception of the fragility of our planet set the stage for many of the environmental protections written into law in the United States during the 1970s that are discussed in this chapter.

Agriculture and Food

Building on this noble vision, the next section of the book engages practical issues related to agriculture and food. One author explains that we are at a tipping point regarding public awareness of climate change. The science surrounding climate change has been around for a long time. However, today, our science is much more sophisticated, and we have a much better understanding of the problem with climate change. Now, we have extensive data on the increase of temperature, the rise of sea level, the increased greenhouse gas concentrations, and the problems in the atmosphere, mostly due to the human-made emission of greenhouse gases. We know of the human influence on climate change. More specifically, we know that a world food crisis is looming large if we do not do something about our greenhouse gas emissions. This will hinder people's access to the food they need, making them more vulnerable to other climate change impacts like heat and the spread of disease, thereby causing further instability and conflict. This chapter provides a fascinating challenge to counter these

problems. Another author then explores in detail what can be described as the food asset potential. The discussion examines what makes people waste food. We think about the food that we choose not to eat as waste and manage its removal as such. Imagine for a moment if food was always treated as an asset, not a liability. We have been taught to categorize food that we choose not to consume as a liability and that is why we so freely waste it. Contemplate for a moment a world where food is always treated as an asset. In this chapter, we are led to imagine the extraordinary implications to our planet and the potential if we treat food as an asset.

Health and the Environment

This section of the book continues to engage practical issues related to a healthy planet, specifically health and the environment. One author considers how the US healthcare industry impacts the environment. The US contributes to approximately 15% of the global anthropocentric greenhouse gas (GHG) emissions and is reported to have the highest GHG emissions per capita of all nations. The healthcare industry in the US is responsible for approximately 10% of all US GHG emissions. To engage these concerns, the chapter explains the reality of present threats to the health and safety resulting from pollution and climate change and then considers potential solutions. Another author continues the focus on health and environment by examining antibiotic abuse and bacteriophage misrepresentation. The old Norse tale of Tyfring, the cursed sword, teaches an important lesson. Some weapons, no matter how powerful, should not be used. Our use of antibiotics is pertinent here. For a long time, they have served us well, but our overreliance will soon tip the scales in an unfavorable direction. The psychopomp, a kind spirit, has been mutated into an evil reaper. We were careless in our translation of their purpose; we transformed them into a monster. Bacteriophages have suffered the same fate. By labeling them as viruses, we have discounted their positive potential. There could be an important lesson here for the health of the planet. Yet another author continues this focus on health and the environment by considering the ethical significance of lead toxicity on child development. Due to changing the source of drinking water provided for the town of Flint in Michigan in the US, the citizens faced dangers of lead toxicity. Here, the effects of environmental degradation emerged as being long-lasting, especially for children. By unknowingly drinking water that contained toxic levels of lead, many children developed cognitive and/or behavioral disabilities. Ethically, there is much to be learned from this incident—from a community/administrative perspective to a public health/global perspective.

The importance of safe drinking water is a public health crisis in which policy and action can produce change and improve quality of life, contributing to the health of the planet.

Global Issues

The next section scrutinizes pivotal global issues that are crucial for a healthy planet. One author examines the impact of integral ecology on research priorities. The concept of integral ecology as proposed by Pope Francis in his Encyclical *Laudato Si'* has an impact on setting priorities for clinical research in developing countries like Haiti. The discussion considers the roots of integral ecology to engage it as a new paradigm for bioethics to set priorities in clinical research in Haiti. This discussion is followed by an analysis of issues related to the Niger Delta Region in Nigeria that is faced with diverse effects of oil exploration activities. The people of this region depend on the environment for their livelihoods. Hence, they are experiencing severe environmental problems, such as pollution, loss of biodiversity, and global warming. One author examines ways of overcoming the environmental/health crises in the Niger Delta through environmental policies that will incorporate the principles of environmental justice, equity, and sustainable development. To address these urgent concerns, another author proposes an African traditional environmental ethics framework. The author explains that the framework can provide an ethical, practical, and ideal approach for establishing required common ground. Because the framework draws attention to the dangers facing the lives of both the current and future generations, the common good, and the dignity and respect for the earth and its inhabitants, it will encourage ecological sustainability.

Generational Perspectives

The final section of the book presents different generational perspectives about working toward a healthy planet. The voices of students are crucial for ongoing discourse about fostering a healthy planet. Each of these chapters was presented as a separate poster at the annual conference that is represented in the proceedings of this book. One chapter considers the appeal of passive homes as a useful means of establishing green infrastructure in rural and urban areas alike. Through the utilization of statistics and collective data, a robust argument is presented to support the expansion of passive house implementation as a means of taking on greater civilian responsibility to foster a healthy planet. Another chapter explains

how the reduction of plastic could help to heal our planet. Producing and consuming plastic is causing extensive problems for our planet, including the flora and fauna and the whole ecosystem on earth. We must find alternatives and solutions. The final chapter in this section bookmarks the discussion by considering the effects of human activities on climate change.

Conclusion

The concluding chapter considers pivotal ethics related to fostering a healthy planet. The discussion reviews the ethical perspectives enunciated in the concluding chapters of the previous books from the annual conference series that generates these proceedings: the urgency of climate change, integral ecology, the global water crisis, and the global sustainability challenge.

Notes

[1] International Energy Agency, *Net Zero by 2050* (May 2021), https://www.iea.org/reports/net-zero-by-2050.
[2] See, United Nations Development Programme, *Sustainable Development Goals* (2015), at, https://www.undp.org/content/undp/en/home/sustainable-development-goals.html.
[3] The organization of this chapter adopts the same approach as previous books in this annual series of conference proceedings.
[4] This discussion reflects the chapters in this book that constitute the proceedings of the conference on Toward a Healthy Planet in Fall 2019.
[5] Pope Francis, *Laudato Si': Praise Be To You. Encyclical Letter of the Holy Father Francis on Care for Our Common Home* (Vatican City: Libreria Editrice Vaticana, 2015), §23.

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I. CONTEXT

CHAPTER TWO

THE ANTHROPOCENE AND ACADEMIC DISCIPLINES: TOWARD THE PRACTICE OF AN ACADEMIC LAND ETHIC

MIKE IRWIN

Introduction

This essay discusses the challenges and advantages of integrating disciplinary insights in environmental policy research. The nature of environmental problems necessarily focuses on the intertwining of humans and their sociocultural systems with those other-than-human systems from micro-biotic to planetary geologic processes. Recognition of mutual influence among these human and other-than-human systems is a hallmark of work on the environment across academia. It is a view of the natural world and the social world as fundamentally part of a common community. This view of the ecosystem can provide the basis to link the distinct areas of inquiry found in sciences, humanities, social sciences, and professions. This common world view can provide a solid basis to understand and address critical environmental problems emerging in the Anthropocene.

This approach provides both a broad intellectual view of the Anthropocene and a broad ethical foundation for approaching associated environmental issues. As Aldo Leopold elegantly defined this view, "All ethics so far evolved rest upon a single premise: that the individual is a member of a community of interdependent parts. . . The land ethic simply enlarges the boundaries of the community to include soils, waters, plants, and animals, or collectively: the land."[1] That view, and the underlying expertise needed to provide effective eco-centered policy, also calls for a community of disciplines. To paraphrase Leopold, an academic land ethic invites respect for insights from fellow members across diverse disciplines and for the land-community.[2] Such an approach holds promise for a fuller

intellectual inquiry but more importantly expands the intellectual scope of policy for action to address a global environmental crisis that involves both natural and human systems.

This insight was apparent in Rachel Carson's assessment of the environmental crisis some 60 years ago. She wrote, "Only within the moment of time represented by the present century has one species – man – acquired significant power to alter the nature of the world. During the past quarter-century, this power has not only increased to one of disturbing magnitude but it has changed in character."[3]

Carson's observation was both prescient and understated. It was prescient in that it foreshadowed 21st concerns with the Anthropocene, an idea that views human activity as the dominant influence on climate and the environment and one with global consequences. It was understated in that the human geological epoch had been well underway since the 18th century. When Carson wrote these words in the 1950s, humans had long been restructuring the global ecosystem. Our 21st-century concerns are that this restructuring has reached a point of disequilibrium that will transform the balance of humans in nature in tangible and material ways. We are seeing this disequilibrium emerge daily in concerns for food, water, air, and health impacts all with roots in the shifting balance between human systems and the larger environment.

These problems, accelerating since the 1950s, were brought to the forefront in 2000 by atmospheric scientist Paul Crutzen. He encapsulated these concerns into a single word, the "Anthropocene," which he proposed as the geologic name of an era dominated by the human race. More recently Crutzen and Schwagerl argued that rather than viewing nature as containing human systems, environmental problems of the Anthropocene are better viewed as contained within the social processes of humans. "The long-held barriers between nature and culture are breaking down. It's no longer us against 'Nature'. Instead, it's we who decide what nature is and what it will be."[4]

From Anthrocentric to Ecocentric Policy in the Anthropocene

Yet policy solutions are often sought solely within the confines of human systems. We rebuild our cities to resist rising seas, innovate through genetic manipulation of crops for drought-resistant grains, and channelize our rain runoff to deal with increased storm activity. These anthropocentric solutions may or may not work in the short run, but all are premised on increasing our control over and separating us from nature. One lesson we

have learned from Carson (and since) is that isolation from nature exacerbates our environmental problems. As Crist argues, underlying these anthropocentric policies is a pervasive worldview of human supremacy that normalizes the expansion of human systems at the expense of all other life-forms and their habitats. The ultimate failure of such an anthropocentric view is that it undermines "our ability to enact these linked strategies and preempt the mounting suffering and dislocation of both humans and nonhumans."[5] Anthropocentrism limits our ability to see alternative pathways and policies of mutual benefit to humans and the beyond-human elements of nature. Such an eco-centered approach stresses adaptation to these environmental changes and in the process lessens our impact on nature. Implementing policy solutions therefore requires intellectual perspectives from across the spectrum of professional and academic inquiry.

Incorporating Social Science and Humanities into Traditional Science Policy

This implementation of eco-centered approaches is only partly dependent upon science and technology. It also requires insights from humanities, social sciences, and professional schools. Eco-centered policy necessitates blending academic disciplines that accept a view of humans as intrinsically integrated with nature rather than a species separate from the global ecosystem. This perspective highlights the importance of transdisciplinary scholarship, particularly the integration of social science and humanities into more traditional natural science analysis. This approach is echoed in policy analysis efforts under the auspices of the European Science Foundation's initiative Responses to Environmental and Societal Challenges for our Unstable Earth (RESCUE). This project produced a series of papers that focus on blending approaches from social science and humanities into traditional natural science models of environmental analysis as discussed below.[6]

Presenting the central objective of the RESCUE initiative, Palsson et al. argue that the traditional science-dominated environmental research should be reconceptualized to better integrate social sciences and humanities. They argue that problems of the Anthropocene require "understanding that complex problems which cut across disciplines may require new epistemological frameworks and methodological practices that exceed any one discipline."[7] They assert that humanist and social science scholarship addresses areas of expertise that are not well developed in the natural

sciences and need "to be drawn upon in order to complement natural science approaches …"[8]

Expanding the academic sphere that defines environmental expertise would, according to Sorlin better promote practical connection to policy in private and public spheres. He notes "environmental expertise is much predicated on natural science in a range of fields that were integrated in a comprehensive understanding."[9] These fields were primarily concerned with elements of nature considered separate and distinct from human systems – a view that Sorlin sees as failing to understand social forces or redress the root causes of the Anthropocene. "As conventional environmental expertise has failed to provide the advice needed to question the driving forces behind environmental degradation and lack of sustainability it is here suggested that environmental expertise be fundamentally reconfigured to include social sciences and humanities."[10]

More than simply expanding the breadth of substantive expertise in environmental research, Holms et al. believe the inclusion of social science and humanities fundamentally changes the world view of natural science.[11] As they state, "This viewpoint emphasizes the need to depart from the dualism of nature–culture and arrive at a clear understanding of the co-evolution of humans and the natural world, which is being continually reshaped by human 'arrangements' and networks."[12] They argue that this approach would bridge the gaps between knowledge and action; link biogeophysical dimensions to social science; and integrate qualitative humanistic analyses and quantitative ecological approaches to promote better-defined sets of concepts and theories.

This idea is echoed in Palsson et al.'s view: "Given human activities' scale and impact, as well as the overly narrow perspectives of environmental research's dominant natural sciences, a major effort is necessary to place the perspectives and insights of the humanities' and social sciences' perspectives and insights at the forefront. Such an effort will require developing integrated approaches, projects, and institutions that truly do so."[13] Such adjustments call for greater openness and interaction among previously separate disciplines, and the reconceptualization of natural science as a separate sphere of study from humanistic approaches.

All recognize that this is a fundamental change in the natural science model. Palsson et al.'s assessment of this change is clear: "It is remarkable how little these concepts tell us about the process, the driving forces, and the social consequences of the changes they imply. There is an increasing need for concepts and narratives from the humanities and social sciences that can address this shortcoming. There is also a growing literature that deals with the issue and tries to articulate what the new human condition in

the Anthropocene might be in ethical, historical, and philosophical terms."[14] Science sees the need to question its basic premises and believes social science and humanities hold the promise for a new model.

Incorporating Science into Traditional Social Science and Humanities Analysis

As with the natural sciences, humanistic approaches from social science to humanities are reconceptualizing fundamental premises in response to the Anthropocene. This is seen in Kregg Hetherington's collection of studies in Infrastructure, Environment, and Life in the Anthropocene. As Hetherington states, "The primary conceptual problem that the Anthropocene causes for social science is that it unsettles the relationship between nature and culture, humans and nonhumans."[15] This lies in the rise of social constructivism as a strong paradigm in sociology, anthropology, and related fields where there were "a slate of theories that treated cultural humans as radically distinct from biological humans . . . in which the autonomy of the social was not only a methodological prerogative; it was the basis of progressive politics."[16] This division between the material and cultural spheres tends to erode as the Anthropocene progresses and is a dualism rejected in these studies. Despite a general social constructivist approach, these authors identify and explore how many social processes are inseparable from the requisites of natural phenomena in which they are embedded. However, in the Anthropocene, nature exerts a causal force that breaks down the conventional separation of biology and culture.[17] Hetherington argues that confronting these concepts as simultaneously natural and social phenomena requires rethinking accepted theory in terms of the autonomy and causal primacy of the social sphere.[18]

Wakefield and Braun's chapter, "Oystertecture: Infrastructure, Profanation, and the Sacred Figure of the Human," illustrates this approach.[19] These authors examine the use of oysters to engineer infrastructure that reduces destructive wave energy associated with rising oceans, and for agriculture to market fresh seafood around in New York City. Here the social value of oysters is redefined as human life managed through oyster life: 'We now manage other life to secure human life' and sustainability of one non-human species aids ours.[20] In this, the oysters play a role in constructing new social worlds.[21]

The oyster beds once seeded by humans are a self-sustaining and natural population that in turn impacts the cultural and economic modes of the local community (here New York City). Although oyster existence enters the cultural realm through their utility to humans, this existence is not

dependent upon that social utility. They argue that "…returning things to common use – returns us to a world that exceeds us and which we do not control."[22]

Here, despite the incorporation into the social and cultural realm, nature is not just shaped by but shapes our social construction as an extra-social influence. Nature is not contained in the social nor separate from the social but is seen as semi-autonomous interactions among species. Here, by applying analysis of the material world in conjunction with subjective meaning, nature and culture are seen not as a dichotomy of opposing theory and method, but as a meaningful whole.[23] In this case-study oysters and social meaning, biology and culture are interdependent and seen as a single natural/cultural ecosystem.

Theorizing nature as a nonhuman actor is restructuring the social constructivist perspective across social sciences and humanities. While many aspects of the environment continue to be defined as social facts rather than natural phenomena, there is an increased awareness that these elements exist and exert influence entirely apart from social definitions. This material otherness brings a natural world into social constructivist's once self-contained social world.

These humanistic approaches increasingly recognize that questions of the Anthropocene require incorporation of the natural/nonsocial into the social and seek to expand the humanist perspective by reformulating concepts and restructuring theories to incorporate how material nature and social patterns are blended.[24]

This trend in social science parallels that found in environmental science: both are embracing a world view that sees socio-cultural systems and natural systems as part of a single ecological community. This convergence provides an intellectual foundation for an Academic Land Ethic – a perspective that incorporates contributions from across the academic landscape.

Barriers and Boundaries to an Academic Land Ethic

This holistic insight to view life and its environment as a single system and the ability to approach the problems of the Anthropocene using that insight is found across diverse disciplines from science to professions to humanities to social science. Yet this holistic imagination is less often matched by disciplinary integration in practice. Disarticulation among disciplines is in part an artifact of the specialization of knowledge across academia. Accumulated depth of theory, method, and content is achieved through a detailed study of the intellectual history and through profound

familiarity with emerging directions within each area. Such intellectual capital enriches each discipline. It also places boundaries between disciplines. These boundaries are reinforced by intellectual world views: differences in intellectual culture, technical language, analytic methods, mechanisms for disseminating knowledge, and criteria for recognizing accomplishment.[25]

Although disciplinary boundaries provide a secure intellectual environment within an academic area, they can also be barriers to the study of phenomena that transcend areas of specialization. The environmental problems of the Anthropocene are one such area and effective policies require boundary-spanning approaches. To do so, though, requires finding ways to combine disciplinary knowledge across those boundaries without diluting the rich intellectual content of each area. There are clear barriers to this process but it also argues that the holistic insight provides a common world view that bridges these intellectual boundaries. Leopold himself foreshadowed this view of a community of academic disciplines bound together by a common world view and an understanding of the many dimensions of ecosystems:

> One of the requisites for an ecological comprehension of land is an understanding of ecology, and this is by no means co-extensive with 'education'; in fact, much higher education seems to deliberately avoid ecological concepts. An understanding of ecology does not necessarily originate in courses bearing ecological labels; it is quite likely to be labeled geography, botany, agronomy, history, or economics.[26]

This broad notion of the idea of ecology as transcending the boundaries of multiple intellectual areas is perhaps finally finding its home in academia. The promise of a holistic approach bridging academic boundaries, an academic land ethic, is right for our times as we struggle to meet the challenges of the Anthropocene. As Aldo Leopold states "By and large, our present problem is one of attitude and implements."[27] An academic land ethic provides a foundation of attitude from which policy implementation can emerge.

Notes

[1] Aldo Leopold, *A Sand County Almanac and Sketches Here and There* (Oxford University Press: New York, 1949), 203-204.
[2] Ibid.
[3] Rachel Carson, *Silent Spring* (The Riverside Press Cambridge, 1962), Kindle Location 67.
[4] Paul J. Crutzen and Christian Schwagerl, "Living in the Anthropocene: Toward a New Global Ethos," *Yale Environment 360* (2011).

[5] Eileen Crist, *Abundant Earth: Toward an Ecological Civilization* (University of Chicago Press: Chicago, 2016), 3.
[6] Jill Jager et al., Editorial, *Environmental Science & Policy* 28 (2013): 1-2.
[7] Gisli Palsson et al., "Reconceptualizing the 'Anthropos' in the Anthropocene: Integrating the Social Sciences and Humanities in Global Environmental Change Research," *Environmental Science & Policy* 28 (2013), 6.
[8] Ibid., 7.
[9] Sverker Sörlin, "Reconfiguring Environmental Expertise," *Environmental Science & Policy*, 28 (2013), 14.
[10] Ibid.
[11] Poul Holm et al., "Collaboration Between the Natural, Social and Human Sciences in Global Change Research," *Environmental Science & Policy* 28 (2013), 25-35.
[12] Ibid., 31.
[13] Gisli Palsson et al., "Reconceptualizing the 'Anthropos' in the Anthropocene: Integrating the Social Sciences and Humanities in Global Environmental Change Research,"*Environmental Science & Policy* 28 (2013), 3.
[14] Ibid., 7.
[15] Kregg Hetherington, "Introduction," in *Infrastructure, Environment, and Life in The Anthropocene*, ed. Kregg Hetherington (Duke University Press: Durham and London, 2019), 4.
[16] Ibid., 9.
[17] Michael D. Irwin, "Review of Infrastructure, Environment, and Life in the Anthropocene," *Contemporary Sociology: A Journal of Reviews* 49 (2019), 270-72.
[18] Hetherington, 10.
[19] Stephanie Wakefield and Bruce Braun, "Oysterstructure: Infrastructure, Profanation, and the Sacred Figure of the Human," in *Infrastructure, Environment, and Life in the Anthropocene*, ed. Kregg Hetherington (Duke University Press: Durham and London, 2019).
[20] Ibid., 198.
[21] Ibid., 204.
[22] Ibid., 212.
[23] Irwin, 270-72.
[24] Michael Mayerfeld Bell and Loka L. Ashwood, *An Invitation to Environmental Sociology* (Sage: Los Angeles, 2016), 4-7; Irwin, 272; Kai N. Lee, William R. Freudenburg, and Richard B. Howarth, *Humans in the Landscape: An Introduction to Environmental Studies* (W.W. Norton and Company: New York, 2013), 43.
[25] Jerry A. Jacobs, *In Defense of Disciplines: Interdisciplinarity and Specialization in the Research University* (The University of Chicago Press: Chicago, 2013), 28-29; Claudia Pahl-Wostl, et al., "Transition towards a new global change science: Requirements for methodologies, methods, data and knowledge," *Environmental Science & Policy*, 28 (2013), 40.
[26] Leopold, 224.
[27] Leopold, 225-226.

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