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THEOLOGY AND ECOLOGY ACROSS THE DISCIPLINES

On Care for Our Common Home

T&T CLARK THEOLOGY

EDITED BY
CELIA DEANE-DRUMMOND
REBECCA ARTINIAN-KAISER

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Theology and Ecology across the Disciplines

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Theology and Ecology Across the Disciplines: On Care for Our Common Home

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Theology and Ecology across the Disciplines

On Care for Our Common Home

Edited by
Celia Deane-Drummond and Rebecca Artinian-Kaiser

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Introduction

Theology Crossing Disciplines on Earth Matters

Celia Deane-Drummond and Rebecca Artinian-Kaiser

The rise of religious environmentalism is one of the hallmarks of the last fifty years, reflecting the pressing moral, scientific, and cultural questions posed by environmental problems, including loss of biodiversity, environmental injustice, and anthropogenic climate change. At the same time, disciplinary domains including theology, religion, history, philosophy, literature, politics, and economics, in their various ways, all have begun to develop distinct perspectives that take into account these urgent environmental questions. Often these conversations are disparate from one another and fail to encourage a rich response to these problems from a multidisciplinary perspective. As integral to the series on *Religion and the University*, the premise of this volume is that the time is ripe for the academic community as a whole to respond to the challenge of environmental responsibility by drawing on different disciplinary insights. We believe the secular environmental humanities and theological approaches can help address the problems facing the global community in the care of our common home.

Readers will note that not all the authors in this volume agree on methodological, theological, or epistemological questions, but the diversity makes this volume a rich resource for debate in educational and scholarly contexts. Moreover, this book cannot represent all the disciplinary positions that might be possible, or even various and diverse cultural perspectives; however, there is a conscious attempt by those writing from a Western theological and cultural starting point to keep a global horizon in view.

This book also takes its inspiration from the invitation by Pope Francis in *Laudato Si'* to bring faith and reason together in consideration of the care of our common home, the Earth. While some authors refer to this encyclical, this book is not a commentary on it. Many, though not all, of the authors come from a Roman Catholic perspective. All, however, are concerned about the social and cultural demands that environmental problems place on humanity, and all engage theological or religious ideas in a way that is appropriate from their disciplinary perspective. As such, this is an exercise in careful dialogue that Pope Francis encouraged in his encyclical. Our focus is on Christian religious traditions, not least because in the Western world the intellectual climate in which different disciplines emerge was largely against the backdrop of a secularized Christian culture. We are aware more work needs to be done in relation

to other religious traditions and their relations to ecology and ethics through a multidisciplinary lens, but that would be the task of a different book.

The prologue that frames the first part of this book is intended to provide the background scientific debate necessary for reflecting on difficult environmental problems. It is not enough just to name the problems; we need to understand how they have arisen and their potential trajectory, and Philip J. Sakimoto's chapter, "Understanding the Science of Climate Change," achieves just that. In a general sense, climate change is easy to understand: gases in our atmosphere—mainly carbon dioxide and methane—trap heat and warm the planet. However, as he notes, climate change can never be fully understood because of the complexity of our atmospheric system. Nevertheless, we still have to make judgments and act based on our current scientific understandings. A reasoned response to climate change, for him, rests on making informed judgments that combine scientific understanding with tendencies gleaned from climate models, while not expecting these models to generate fully substantiated correlations and predictions.

The first main part boldly flagged under the heading "Culture" is a sampling from history, literature, philosophy, and theology. The emergence of ecotheology is usually associated with the emergence of environmentalism in the 1960s and 1970s and Lynn White's famous critique that the anthropocentric Judeo-Christian faiths were primarily responsible for the modern "ecologic crisis." In "Ecotheology before Ecology and Environmentalism: Reclaiming the Missing Heritage of Natural Theology," Christopher Hamlin explores Protestant natural theology from 1700 to 1900 on the human place in the biogeosphere. Much of our knowledge of this literature is through the superficial examples of a design argument in which nature functions to satisfy human needs and desires, but, for Hamlin, this literature is more varied and subtle. Respect for cycles, appreciation of the nonutilitarian value of natural things, and even sustainable technologies are common elements. Drawing on English, German, and Dutch natural theologians, Hamlin examines four cases, which are of interest for anticipating public issues of ecotheological importance: biodiversity, human population limits, recycling-reuse, and climate dynamics.

In "Thoreau's Woodchopper, Wordsworth's Leech-gatherer, and the Representation of 'Humble and Rustic Life,'" Alda Balthrop-Lewis investigates the danger of caricature in pastoral literature. Through an examination of two literary portraits of men living "humble and rustic" lives in Wordsworth's "Resolution and Independence" and Thoreau's *Walden*, she highlights the controversy surrounding representations of the rural other. Even though Wordsworth and Thoreau may appear to be paternalistically simplifying their subjects, she offers a persuasive interpretation that it may make more sense of the tradition to view these authors as taking part in an argument about what it means to represent a relation to another. This argument reappears in the contemporary context surrounding representations of rural people struggling with ecological change, and for Balthrop-Lewis, recovering texts from Wordsworth and Thoreau can inform our thinking about representing others in spite of the danger of caricature.

David Kirchhoffer examines in "How Ecology Can Save the Life of Theology: A Philosophical Contribution to the Engagement of Ecology and Theology" the interplay between theology and ecology. He suggests that because theology is frequently

subsumed by religious studies and philosophy of religion in the university, theology is hampered from adequately addressing “real world” religious debates. In this chapter, he shows how theology can benefit from a deeper engagement with ecology so that theology can, for example, avoid anthropocentrism and a reliance on outdated biologies and cosmologies, more adequately address the particularities of context, and enrich its understanding of the historicity of relationships and the need for equity.

In “Key Issues in Ecological Theology: Incarnation, Evolution, Communion,” Denis Edwards calls for ecological transformation, requiring change at the deeper level of human interiority and in our relationships with the rest of the natural world, and involving new ways of seeing, feeling, thinking, and acting. For Christians, interiority is shaped, at least in part, by faith, and ecological theology can educate that faith, calling believers to ecological conversion and offering meaning and motivation for ecological commitments and practices. Edwards offers three priorities for such an ecological theology: a focus on the incarnation as the center of Christian ecological theology, an examination of evolution and its costs, and an exploration of the theological meaning of the natural world.

The second part entitled “Social Science” brings in a sampling from this subfield—the disciplines of economics, politics, and peace studies. *Laudato Si’* is generally critical of the performance of market economies while recognizing the benefits of economic growth and that business enterprise can be a noble vocation. In Mark G. Hayes’s chapter “Creation and Creativity,” the question arises as to whether Pope Francis is consistent: can we enjoy the benefits of advanced technology without the process of “creative destruction,” which economists argue is necessary for technological innovation? And is creative destruction consistent with commitments to protect employment and income stability? He further probes the economic implications of giving equal priority to human dignity and creativity within a framework of the common good, and examines the nature of economic growth and moves toward remedies for unemployment, a by-product of economic growth.

Employing the tools of political science, Kyle Beam’s chapter “‘No Compromise in Defense of Mother Earth’: The Religion and Politics of Radical Environmentalism” explores the Earth-centered spirituality of radical environmentalism in the United States. This spirituality, he believes, provides a strong justification for political militancy among activists, who see themselves as defenders of a threatened and sacred wilderness. Moreover, Beam explores how radical environmentalism revived the religious ethos of the nineteenth-century wilderness preservation movement, thereby finding a political outlet for environmental activists of a spiritual bent at a time when mainstream environmentalism was becoming a professionalized and bureaucratic interest group.

Drawing on the emerging field of peace studies, Michael Yankoski’s chapter “Strategic Peacebuilding and an ‘Integral Ecology’” offers a fresh way to explore the meaning of integral ecology. Given that our current environmental problems cannot be isolated to one single cause, Yankoski recognizes that no single approach is sufficient to interrogate the catastrophe’s multifaceted causes or ramifications. He offers the organizing concept of *strategic peacebuilding* as a way of cultivating an “integral ecology” at every level of human cooperation. In doing this, he locates the ecological

crisis within peace studies' conceptual framework of direct, structural, and cultural violence; argues for a systems theory and hybrid approach to the transformation of systems of violence; explores population displacement to illustrate the threats posed by the Anthropocene; and invites peace studies to move beyond anthropocentrism into a richer vision of flourishing and peace.

The third part designated "Critique" brings in voices more specifically resistant to common assumptions made in environmental ethics and ecotheology. These chapters address important critiques of the language of sustainable development, new frameworks for environmental ethics through a planetary boundaries model, and gender questions. In "Against the 'Unity' of Babel: Liberation Theology and the Language of Sustainable Development," Daniel P. Castillo brings liberation theology into dialogue with environmental science and environmental ethics. He examines early liberationist use of the language of "liberation," its critique of the language of "development," and its contention that the language of development described a historical project perpetuating the underdevelopment of the global south. Against this backdrop, he argues there is reason to scrutinize the contemporary language of "sustainable development" and, in so doing, question the structures of the global political economy this language seeks to legitimize.

In "The Environment, the Common Good, and Women's Participation," Lisa Sowle Cahill raises the issue of environmental degradation and its unequal effects across gender lines. Because women are heavily involved in providing daily sustenance for their families and in agricultural production worldwide, they are disproportionately affected by environmental degradation and, thus, are also on the vanguard of environmental movements. Nevertheless, women's involvement is overlooked in *Laudato Si'*, Catholic social teaching, and in faith-based environmental organizing. Using *Laudato Si'* as a point of departure, Cahill examines the role of women in faith-based efforts to protect the natural environment and shows why women's participation is necessary for the preservation of the ecological common good.

In "The Planetary Boundaries Framework and Food Production: A Radical Redefinition of Sustainable Development?," Johan de Tavernier explores the planetary boundaries framework, which names the nine key earth system processes and boundaries that should not be transgressed to maintain a low risk of destabilizing the earth system. In this chapter, Tavernier seeks to redefine the language of sustainable development by using planetary boundary frameworks, and he argues that sustainability can only be achieved if we live within the ecological carrying capacity of the Earth and respect the biophysical limits of our planet.

The fourth part on "Practices" begins with a chapter on ecological restoration and then moves to two areas essential for all forms of biotic life, namely water and food. In "Restoration and Transformation: A Theological Engagement with Ecological Restoration," Rebecca Artinian-Kaiser examines the practice of restoring degraded environments. She homes in on inherent tensions within the practice surrounding the role of history for determining action and the role of the human person. Drawing on the resurrection motifs of restoration and transformation, she navigates these tensions in order to argue for an approach to restoration that, on the one hand, recognizes the value of past ecosystems while, on the other hand, opens up space for action that

moves beyond a return to the past to creatively respond to present environmental challenges with wisdom and love.

In “*Laudato Si’* and Standing Rock: Water Justice and Indigenous Ecological Knowledge,” Christiana Zenner examines contemporary conflicts surrounding access to freshwater, which for her arise from the complex intersections of hydrogeology, globalized political economies reliant upon resource extraction, and diverse cultural values and social norms concerning the distribution and use of water. Engaging the implications of *Laudato Si’* for these conflicts, Zenner integrates awareness of global freshwater dynamics, the encyclical’s comments on freshwater and indigenous cultural value, and rallying cries for the sacredness and protection of water articulated by indigenous activists at Standing Rock, North Dakota.

Amid growing concerns about food security for an estimated future population of 10–11 billion people, threats to ecosystem health and resilience, and social and political stressors exacerbated by climate change and other environmental problems, Norman Wirzba suggests that food systems give us an excellent vantage point from which to understand and address these challenges. In “Eating Our Way into the Care of Our Common Home,” Wirzba presents a theological critique of food systems and offers a way to conceive of eating and food production through an examination of the Eucharist. He uses the liturgical meal as a window into the meaning of food as the place where God’s love for the world is particularly evident, and he suggests that churches and communities can play a key role in reimagining global food systems and thereby also participate in the healing of our common home.

The chapters in the part “New Directions” seek to reenvision understandings of the future by re-crafting theoretical frameworks of particular disciplines. So, in the chapter on law, there is a reframing through beauty, and in the chapters on biodiversity and evolution, there is a reframing of traditional theologies through biodiversity and evolutionary perspectives. The 2015 Paris talks on climate change demonstrated that law is the means by which ideas are put into action. For such laws to be effective, there has to be respect for the law; however, as examples of disregard for rules on peace, human rights, and the environment reveal, law is in crisis. Many legal theorists have settled on economic theory as the rationale behind the binding nature of law. In “Law for and from the Natural World,” Mary Ellen O’Connell with Marie-Claire Klassen reexamine the law and economics consensus in the context of global environmental challenges. They argue that economics is not a sufficient substitute for the theory of legal authority once provided by theology, and they propose drawing on new theological insights on the importance of beauty, especially the beauty of the natural world, to develop a new approach to legal authority and the protection of our common home.

In Chapter 15, “In Defense of Biodiversity: Biodiversity in Ecology and Theology,” Carmody T.S. Grey explores how definitions of biodiversity rely on notions of the good and the true that presuppose some rendering of reality as a whole, but which exceed the bounds of what ecology can address. She argues for drawing on theology, in particular Thomas Aquinas’s account of the good as created diversity, to articulate an understanding of nature rooted in an account of diversity and its goodness. For Grey, Christian theology accepts a broader vision of reality in which ecological intuitions can be recognized as metaphysical and thereby negotiated more constructively as such.

In turn, this enables ecology to give a more robust account of the good as creaturely diversity.

In the final chapter, “Evolution: A Theology of Niche Construction for the Twenty-first Century,” Celia Deane-Drummond explores the concept of niche construction and reviews evidence for the extended evolutionary synthesis (EES) in comparison with standard evolutionary theory, which relies on trait-based models of evolution by natural selection and survival of the fittest. The newer model emphasizes the dynamic interchange between humans and other creatures in their natural environments and presses further than the thesis of simple entanglement between different species, toward a dynamic directional movement. Human beings, insofar as they are self-aware, can form the world in a self-conscious way, and this brings a burden of responsibility for the future of planet Earth. In the Anthropocene era, we have over-formed that world without even being aware of doing so. Evolutionary and social sciences resist charting a hoped-for future or *telos* in a way that theological anthropology does not. Deane-Drummond argues that a theology of niche construction through a revised theological anthropology fills the conceptual void left behind in the wake of nondirectional secular theories of evolutionary naturalism. Furthermore, secular theories that inappropriately attach niche construction to eco-modernism fail insofar as they present a secular eschatology reliant on human technology to solve complex and pressing environmental problems.

It is our hope that the chapters of this book inspire deeper engagement between the disciplines that opens up to more spacious analysis and critique within the disciplines themselves *and* is directed toward addressing the pressing environmental issues of our day. The diversity of voices represented here is driven by deep concern for Earth, our common home, and reflects a desire to reach out to other perspectives to gain wisdom about the attitudes and behaviors we as humans will need in order to ensure our own flourishing and that of other creatures.

Prologue

Understanding the Science of Climate Change

Philip J. Sakimoto

Introduction

As a physical system, our climate is both utterly simple and insanely complex. It is simple in the sense that a basic estimate of the Earth's temperature can be calculated from a simple consideration of energy balance. Light from the Sun penetrates through our atmosphere and is absorbed by the Earth as heat energy. The Earth tries to return this heat energy back to space by reradiating it as infrared radiation (heat rays, in the vernacular). Certain molecules in the atmosphere—most notably carbon dioxide—block some of the infrared radiation from escaping, thus trapping some of the heat and warming the planet. Because the carbon dioxide plays a role similar to that played by glass in a greenhouse, this trapping of heat in the Earth's atmosphere has come to be known as the “greenhouse effect.” The molecules that cause it are called “greenhouse gases.” Making basic estimates of a planet's average temperature based on these considerations is a fairly simple exercise.¹

The greenhouse effect leads to the basic astronomical principle that the more carbon dioxide there is in a planet's atmosphere, the warmer that planet will be. The veracity of this principle is borne out in our own solar system. The Earth, with a rather modest amount of carbon dioxide in its atmosphere, has an average surface temperature of about 15 degrees Celsius (60°F). Venus, with a massively thick carbon dioxide atmosphere, has an average surface temperature of about 470 degrees Celsius (nearly 900°F). Although part of the reason for Venus's high temperature is that it is closer to the Sun than is the Earth, the impact of the greenhouse effect can be seen by comparing Venus's temperature to that of Mercury. Mercury is even closer to the Sun, but because it has almost no atmosphere at all, its average surface temperature is only about 430 degrees Celsius (800°F)—noticeably cooler than that of Venus.² These considerations illustrate the simplicity and truth of the greenhouse effect.

¹ American Chemical Society, “Atmospheres and Planetary Temperatures,” *ACS Climate Science Toolkit/Energy Balance*. Online: <http://www.acs.org/content/acs/en/climatescience/energybalance/planetarytemperatures.html> (accessed December 26, 2015); Yochanan Kushnir, “Understanding the Greenhouse Effect,” *Columbia University* (2000). Online: http://eesc.columbia.edu/courses/ees/climate/lectures/gh_kushnir.html (accessed December 26, 2015).

² Lunar and Planetary Institute, “Solar System Temperatures,” NASA Solar System Exploration Division (2003). Online: <http://solarsystem.nasa.gov/galleries/solar-system-temperatures> (accessed January 11, 2016).

Our climate is complex in that there is a plethora of details not included in the simple energy balance calculation described earlier. Differing land covers (snow, ice, bare ground, water, etc.) and the presence of clouds impact the amount of sunlight that is absorbed. There are many greenhouse gases in addition to carbon dioxide (CO₂) that also contribute to trapping excess heat. Among them are natural sources such as water vapor and human-caused sources such as methane (CH₄), nitrous oxide (N₂O), and fluorinated gases—most notably hydrofluorocarbons (HFCs) and sulfur hexafluoride (SF₆).³ The length of time that each species of greenhouse gas remains in the atmosphere varies considerably, depending on chemical reactions in the atmosphere and on chemical exchanges between the atmosphere, oceans, and land. The actions of winds and ocean currents, the melting of ice, and the presence of biological processes all add additional complications.

Climate scientists put enormous efforts into creating General Circulation Models—models of our atmospheric system. Such models are now very sophisticated, but they can never be fully complete: taking into account every possible detail is, essentially, impossible. Many of the contributing processes are not understood well enough to be accurately included in models, and, even if they were, they could not all be included due to the limitations of available computer capabilities. Indeed, the history of creating and improving General Circulation Models is the history of continually exploiting advances in computing power and never having enough of it.⁴

This is unfortunate because we, as inhabitants of planet Earth, would like to know what our future holds. What impacts will our greenhouse gas emissions have on the overall climate and on the level of the oceans? How severe will the impact of the changing climate be on disasters such as extreme storms, floods, droughts, fires, and the spreading of diseases? How much and how quickly must we reduce greenhouse gas emissions in order to avoid the worst of these impacts?

Current climate models have great difficulties in making definitive predictions on such issues, not only because of the limitations on understanding and computer power but also because we want them to do things that they are inherently not designed to do:

1. We have a cultural bias toward wanting to assign a single cause to every particular event or disaster (e.g., “Did global warming *cause* Superstorm Sandy?”). Causality is usually not so simple. Most disasters have multiple interrelated causes. Climate change is often one of many contributing factors in which case the single-source causality question cannot be answered with a simple “yes” or “no.”
2. Scientific integrity requires limiting predictions (or assigning causality) to cases that can be laid out in fully verified detail. Given the fact that climate models cannot reasonably take into account every possible detail, it is not practically possible for climate models to make fully accurate predictions.
3. Climate models are typically built for the primary purpose of deepening our understanding of how processes within our atmosphere work, not for the purpose

³ US Environmental Protection Agency (EPA), “Overview of Greenhouse Gases.” Online: <http://www3.epa.gov/climatechange/ghgemissions/gases.html> (accessed December 29, 2015).

⁴ American Institute of Physics, “General Circulation Models of Climate,” *The Discovery of Global Warming* (2016). Online: <https://www.aip.org/history/climate/GCM.htm> (accessed December 27, 2015).

of making predictions. Hence, they are inherently limited in their usefulness for making predictions.⁵

4. Events of interest, such as a single storm, are typically too small to be resolved on the global scales upon which climate models are calculated. In some cases, special microscale models are devised or embedded within the global models in order to track small-scale phenomena, but until recently⁶ that has been the exception rather than the rule.⁷
5. The amounts of greenhouse gases that we are putting into our atmosphere are driving the atmosphere into a regime that we have never before experienced. Therefore, it is possible that there may be processes and consequences that will be overlooked in the models simply because they have never happened before. Modern science is very good at explaining what has previously been observed; it is notoriously bad at predicting phenomena that have not previously been seen.

We are, at base, conducting for the first time an experiment in seeing how our planet responds to having copious amounts of greenhouse gases placed in its atmosphere. Since we are living *inside* this experiment, we cannot afford to wait until the experiment has played itself out to find out what the consequences might be. We, therefore, need to make educated assessments based on the best information currently available. We can observe trends and warning signs. We can apply our knowledge of the basic processes that drive our climate and the understandings gleaned from climate models to infer how climate change might contribute to or enhance particular phenomena. From this, we can make relatively reliable long-term statistical predictions even though we generally cannot predict specific events or circumstances. We have to make and act upon such predictions now, even if they have to be made without the full scientific rigor that we would prefer. With this philosophy in mind, we turn to examining the role of carbon in our atmosphere.

Carbon in our atmosphere

Historical warnings

The first warning that excess carbon dioxide in our atmosphere might cause global warming came in 1859 when John Tyndall discovered that carbon dioxide blocks infrared radiation. He noted that carbon dioxide in the Earth's atmosphere could therefore block infrared radiation from escaping and thus cause warming of the planet.⁸

⁵ Colin Macilwain, "A Touch of the Random," *Science* 344 (2014): 1221–3.

⁶ Paul Voosen, "The Weather Master," *Science* 356 (2017): 128–31.

⁷ Anthony Del Genio, "Will a Warmer World Be Stormier?" *Earthzine* (2011). Online: <http://earthzine.org/2011/04/16/will-a-warmer-world-be-stormier/> (accessed January 6, 2016).

⁸ Steve Graham, "John Tyndall (1820–1893)," *NASA Earth Observatory* (1999). Online: <http://earthobservatory.nasa.gov/Features/Tyndall/> (accessed January 7, 2016); American Institute of Physics, "The Carbon Dioxide Greenhouse Effect," *The Discovery of Global Warming* (2015). Online: <https://www.aip.org/history/climate/co2.htm> (accessed January 7, 2016); John Tyndall, "On the Absorption and Radiation of Heat by Gases and Vapours," *Philosophical Magazine* ser. 4, 22 (1861): 169–94, 273–85; John Tyndall, "On Radiation through the Earth's Atmosphere," *Philosophical Magazine* ser. 4, 25 (1863): 200–6.

In 1896, Svante Arrhenius made the first calculations of just how much warmer the Earth might get. He predicted that if the amount of carbon dioxide in our atmosphere was doubled, then the average temperature of the Earth would rise by 5 or 6 degrees Celsius.⁹ At the time, this was not seen as a concern because he estimated that, at the then current rates of burning fossil fuels, it would take some 3,000 years to double the carbon dioxide in the atmosphere. Little did he know how quickly the next generation of humans would dig up and burn those fossil fuels.

Fossil fuels

Fossil fuels are not really fossils in the sense of being the preserved skeletal remnants of prehistoric plants or animals. They are, however, the remnants of prehistoric life preserved in a much different way.

The earliest life on Earth was blue-green algae and cyanobacteria. It came into being on an early Earth that had an atmosphere containing a great deal of carbon dioxide but no oxygen. That early life, and the higher-order plants that followed, removed most of the carbon dioxide and replaced it with oxygen. This eventually led to the present-day atmosphere that is about 20 percent oxygen and much less than 1 percent carbon dioxide. This very small amount of carbon dioxide is quite sufficient to provide a substantial amount of natural greenhouse warming. Without it, the Earth would be a much colder place than it is now.

As early plant life flourished and died, its remnants were laid down in layers of carbon that became what we now call fossil fuels. Land-based plants were buried underground where they became coal, and ocean-dwelling plankton were buried beneath the sea floor where they became oil and natural gas.¹⁰ In these processes, the carbon they took out of the atmosphere while alive was stored away underground when they died, where it remained until the industrial age. We are now digging up that carbon and, by virtue of burning it, returning it to the atmosphere. In the process of burning, we are reattaching oxygen to the carbon in the fossil fuels and thus re-creating the carbon dioxide, which we then release into the atmosphere.

Human activities

Carbon dioxide is by far the most prevalent greenhouse gas that we put into our atmosphere. The most prodigious source is the coal that we burn for electricity,

⁹ Svante Arrhenius, "On the Influence of Carbonic Acid in the Air upon the Temperature of the Ground," *Philosophical Magazine* 41 (1896): 237–76; Svante Arrhenius, "On the Influence of Carbonic Acid in the Air upon Temperature of the Earth," *Astronomical Society of the Pacific* 9.54 (1897): 14.

¹⁰ Smithsonian Institution, "My, How You've Changed," *Change Is in the Air* (2006). Online: http://forces.si.edu/atmosphere/02_02_00.html (accessed January 5, 2016); Octave Levenspiel, Thomas Fitzgerald, and Donald Pettit, "Earth's Atmosphere before the Age of Dinosaurs," *Chemical Innovation* 30.12 (2000): 50–5. Online: <http://pubs.acs.org/subscribe/archive/ci/30/i12/html/12learn.html> (accessed January 5, 2016); California Energy Commission, "Fossil Fuels—Coal, Oil, Natural Gas," *Energy Quest* (2012). Online: <http://www.energyquest.ca.gov/story/chapter08.html> (accessed January 5, 2016).

heating, and industrial processes.¹¹ To produce a given amount of useful energy, coal releases roughly twice as much carbon dioxide than does natural gas; however, leakage of natural gas directly into the atmosphere can make natural gas as potent a source of greenhouse gases as coal.¹² Oil is slightly less of a greenhouse gas source, releasing roughly 25 percent less carbon dioxide to produce a given amount of energy than does coal.¹³ The next largest sources of carbon dioxide are land use activities, most notably industrial agriculture and the burning of forests.¹⁴

The amount of carbon dioxide in our atmosphere is substantially higher now than it has been for at least the past 800,000 years. This is revealed by records found in ice cores drilled from deep in Antarctic glaciers. As layers of ice are laid down year by year, water and bubbles of air are frozen into each layer, creating a record that can be read. The bubbles of air allow direct measurement of the historical atmospheric composition, and the ratios of isotopes in the water can be used to infer the past temperatures.¹⁵ Such analyses have now been successfully conducted for the past 800,000 years of Earth history, and they show that the amount of carbon dioxide in the atmosphere and the Earth's average temperature have gone up and down in lockstep over the last nine ice ages.¹⁶

Examining this record in detail shows how our atmosphere has historically responded to small changes in temperature with large feedback loops that accelerate the temperature change. The temperature changes leading to ice ages are initiated by the interplay of periodic variations in the Earth's orbit around the Sun with the tilt of the Earth's rotation axis with respect to its orbit. This interplay leads to periodic small changes in the solar heating upon the Earth in cycles of roughly 100,000 years, known as Milankovitch cycles. A multiplicity of factors then leads to feedback loops that drive the climate system into an ice age or into a warm interglacial period. Among the most prominent of these factors are the absorption of carbon dioxide by the ocean¹⁷ and the reflection of sunlight by glaciers.¹⁸

¹¹ US EPA, "Overview of Greenhouse Gases"; National Research Council, *Advancing the Science of Climate Change* (Washington, DC: The National Academies Press, 2010); US Department of State, *Fourth Climate Action Report to the UN Framework Convention on Climate Change: Projected Greenhouse Gas Emissions* (Washington, DC: US Department of State, 2007); US EPA, *Global Greenhouse Gas Emissions Data* (2016). Online: <http://www3.epa.gov/climatechange/ghgemissions/global.html> (accessed January 5, 2016); IPCC, "Summary for Policymakers."

¹² See Union of Concerned Scientists, "Environmental Impacts of Natural Gas." Online: http://www.ucsusa.org/clean_energy/our-energy-choices/coal-and-other-fossil-fuels/environmental-impacts-of-natural-gas.html (accessed October 5, 2016).

¹³ US Energy Information Administration, "How Much Carbon Dioxide Is Produced When Different Fuels Are Burned?" (2016). Online: <https://www.eia.gov/tools/faqs/faq.cfm?id=73&t=11> (accessed January 14, 2016).

¹⁴ US EPA, *Global Greenhouse Gas*.

¹⁵ Amy Dusto, "Climate at the Core," NOAA (2014). Online: <https://www.climate.gov/news-features/climate-tech/climate-core-how-scientists-study-ice-cores-reveal-earth%E2U80%99s-climate> (accessed January 14, 2016); Holli Riebeek, "Paleoclimatology: The Ice Core Record," NASA Earth Observatory (2005). Online: http://earthobservatory.nasa.gov/Features/Paleoclimatology_IceCores/ (accessed January 14, 2016).

¹⁶ Daniel Harris, "Charles David Keeling and the Story of Atmospheric CO₂ Measurements," *Analytical Chemistry* 82.19 (2010): 7865–70. Online: <http://pubs.acs.org/doi/abs/10.1021/ac1001492> (accessed January 14, 2016); Luthi Dieter et al., "High-resolution Carbon Dioxide Concentration Record 650,000–800,000 Years before Present," *Nature* 453.7193 (2008): 379–82.

¹⁷ N.J. Shackleton, "The 100,000-year Ice-age Cycle Identified and Found to Lag Temperature, Carbon Dioxide, and Orbital Eccentricity," *Science* 289 (2000): 1897–902.

¹⁸ E.T.H. Zurich, "Why an Ice Age Occurs Every 100,000 Years," *ScienceDaily* 7 (2013). Online: <http://www.sciencedaily.com/releases/2013/08/130807134127.htm> (accessed January 16, 2016); Ayalo Abe-Ouchi et al., "Insolation-driven 100,000-year Glacial Cycles and Hysteresis of Ice-sheet Volume," *Nature* 500.7461 (2013): 190.

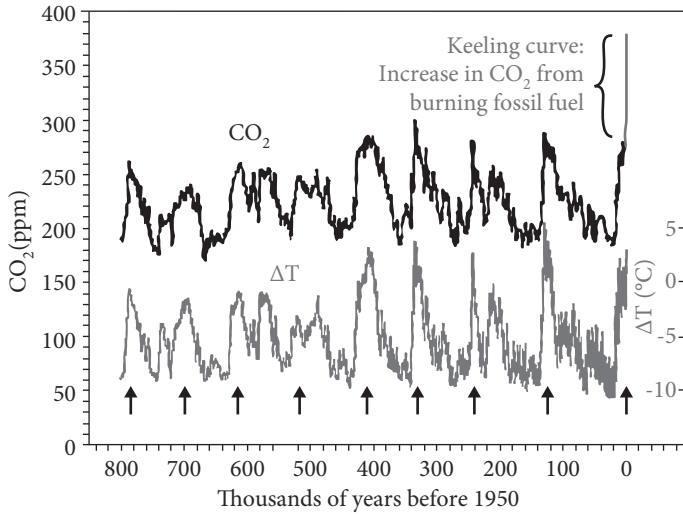


Figure P.1 The upper and lower graphs show atmospheric CO₂ and temperature, respectively, derived from ice core measurements covering the past 800,000 years. The arrows mark 100,000-year cycles of triggers due to orbital variations. Superimposed at the upper right are modern-day measurements of CO₂ (the Keeling curve) showing CO₂ approaching 400 ppm as of 2010. From Daniel Harris, “Charles David Keeling and the Story of Atmospheric CO₂ Measurements,” *Anal. Chem.* 82.19 (2010): 7865–70.

An ice age is triggered when the orbital cycles lead to times of decreased solar heating and therefore lower temperatures. The oceans respond by absorbing more than their usual amount of carbon dioxide from the atmosphere, thus reducing the amount of greenhouse warming and consequently driving temperatures down even further. Ice sheets begin to grow. Since ice reflects back into space more sunlight than does bare ground or water, the Earth absorbs even less sunlight and thus cools even faster. The result is an ice age.

Conversely, when the orbital effects lead to periods of increased solar heating, warmer temperatures decrease the amount of carbon dioxide absorbed by the ocean. This places more carbon dioxide into the atmosphere, enhancing the greenhouse effect and raising the temperature. Ice melts, exposing bare ground and water that absorbs more sunlight than did the ice, thus accelerating the warming. The result is a warm interglacial period such as the one in which we are now living.

There are two important points to note in Figure P.1, which shows the rise and fall of temperatures and carbon dioxide concentration over the past nine ice ages, spanning a period of 800,000 years. First, historically, changes in temperature have always *preceded* changes in carbon dioxide concentration for the reasons described earlier. Second, before the industrial age, the carbon dioxide concentration never exceeded 300 parts per million.

Modern direct measurements of carbon dioxide concentrations in the atmosphere, which began in the 1950s, are displayed in the upper right of Figure P.1. They show carbon dioxide concentrations rising rapidly toward 400 parts per million (as of

2010). In 2015, carbon dioxide concentrations passed the threshold of 400 parts per million.¹⁹ If we continue to add carbon dioxide to the atmosphere at the present rates, the concentration could exceed 600 parts per million by mid-century.²⁰ This would be the doubling of carbon dioxide that Arrhenius thought would not be reached for at least another 3,000 years.

So we, the people of planet Earth, are conducting a massive experiment with our atmosphere. We are forcing the amount of carbon dioxide to levels far beyond that found in past natural cycles, and we are doing so in such a way that the carbon dioxide increases are *leading* temperature changes rather than following them. The logical conclusion is that rising temperatures are sure to follow and that those temperatures will exceed any experienced over the past 800,000 years.

Global warming and climate change

Global warming

The global average temperature is already rising. Temperature records compiled from weather station data since 1880 show that seventeen of the eighteen warmest years ever recorded occurred during this century. The warmest year on record was 2016, and it was the third record-setting year in a row.²¹ A year earlier, in 2015, the total temperature increase since the preindustrial era passed the long-anticipated 1 degree Celsius mark.²² We are experiencing *global warming*.

Visual evidence of global warming is readily evident from space. The extent of polar sea ice is decreasing, especially in the Arctic,²³ and, globally, glaciers are receding at unprecedented rates.²⁴ As the ice melts, it triggers one of many feedback loops that increase the pace of global warming.

¹⁹ NOAA Earth System Research Laboratory, "Trends in Atmospheric Carbon Dioxide," Global Greenhouse Gas Reference Network (2015). Online: <http://www.esrl.noaa.gov/gmd/ccgg/trends/weekly.html> (accessed December 30, 2015).

²⁰ IPCC, "Carbon Dioxide: Projected Emissions and Concentrations," IPCC Data Distribution Centre (2014). Online: http://www.ipcc-data.org/observ/ddc_co2.html (accessed December 30, 2015).

²¹ NASA, "NASA, NOAA Data Show 2016 Warmest Year on Record Globally," NASA Press Release 17-006 (2017). Online: <https://www.nasa.gov/press-release/nasa-noaa-data-show-2016-warmest-year-on-record-globally> (accessed July 26, 2017). "Global Climate Report – Annual 2017," NOAA (2018). Online: <https://www.ncdc.noaa.gov/sotc/global/201713> (accessed March 13, 2018).

²² NOAA, "July 2015 Was Warmest Month Ever Recorded for the Globe," *ScienceDaily* (2015). Online: <http://www.sciencedaily.com/releases/2015/08/150820152817.htm> (accessed August 20, 2016); NASA Goddard Institute for Space Studies, "GISS Surface Temperature Analysis (GISTEMP)" (2016). Online: <http://data.giss.nasa.gov/gistemp/> (accessed January 20, 2016).

²³ NASA Earth Observatory, "Arctic Sea Ice." Online: http://earthobservatory.nasa.gov/Features/WorldOfChange/sea_ice.php (accessed December 30, 2015); NASA Goddard Space Flight Center, "Global Sea Ice Diminishing, Despite Antarctic Gains," *ScienceDaily* (2015). Online: <http://www.sciencedaily.com/releases/2015/02/150210160103.htm> (accessed December 30, 2015); Claire Parkinson, "Global Sea Ice Coverage from Satellite Data," *Journal of Climate* 27.24 (2014): 9377.

²⁴ National Snow & Ice Data Center, "Global Glacier Recession" (2015). Online: <https://nsidc.org/glims/glaciermelt/> (accessed December 30, 2015); Michael Zemp et al., "Historically Unprecedented Global Glacier Decline in the Early 21st Century," *Journal of Glaciology* 61.228 (2015): 745–62.

Feedback loops

One often hears that our climate has passed a “tipping point” or, as one of the editors of this volume is fond of saying, is “coming apart at the seams.” These are apt observations, as there are a myriad of feedback loops that drive the warming to proceed at an ever-increasing pace.

The warming is most pronounced in the northern polar regions where temperatures are rising twice as fast as they are at more temperate latitudes. This rapid warming is driven by a multiplicity of feedback loops that, collectively, are referred to as Arctic amplification.²⁵ The primary feedback mechanism is the loss of ice and snow cover, which reduces the amount of sunlight reflected back into space. Exposed land and water absorb more sunlight than did the ice and snow, and therefore accelerate the warming.

Black carbon—that is, soot—also exacerbates the warming. When soot settles on glaciers, it greatly reduces the reflection of sunlight and increases its absorption. This warms the ice, which leads to more rapid melting and faster warming. Some of the soot eventually flows with the ice melt into the ocean. Once there, it dissolves, forming carbon dioxide that is released into the air where it further enhances greenhouse warming.²⁶

Thawing tundra adds to Arctic amplification. In its normal state, tundra is permanently frozen soil that serves as a deep freeze for keeping carbon out of the atmosphere. In a warming climate, the tundra melts, forming pools of water beneath which vegetation decomposes. Decomposition underwater—in the absence of oxygen—produces carbon dioxide²⁷ and methane²⁸ that is subsequently released to the atmosphere. The methane is a major concern since it traps thirty times more heat than does an equivalent amount of carbon dioxide (over a hundred-year period).²⁹

Additional feedback loops come from the responses of biota to the warming climate, sometimes in unexpected ways. Tree growth, for example, is enhanced by excess carbon dioxide in the atmosphere. In principle, this should increase the number and extent of trees and hence increase the amount of carbon dioxide that is removed

²⁵ NASA Earth Observatory. Online: <http://earthobservatory.nasa.gov/IOTD/view.php?id=81214> (accessed December 30, 2015); M. Serreze and R. Barry, “Processes and Impacts of Arctic Amplification,” *Global and Planetary Change* 77.1–2 (2011): 85–96.

²⁶ University of Georgia, “Climate Change Likely to Increase Black Carbon Input to the Arctic Ocean,” *ScienceDaily* (2015). Online: <http://www.sciencedaily.com/releases/2015/11/151130182247.htm> (accessed December 1, 2015); Aron Stubbins et al., “Utilizing Colored Dissolved Organic Matter to Derive Dissolved Black Carbon Export by Arctic Rivers,” *Frontiers in Earth Science* (2015). Online: <http://dx.doi.org/10.3389/feart.2015.00063> (accessed December 1, 2015).

²⁷ University of Colorado at Boulder, “Ancient Permafrost Quickly Transforms to Carbon Dioxide upon Thaw,” *ScienceDaily* (2015). Online: <http://www.sciencedaily.com/releases/2015/10/151026171407.htm> (accessed December 21, 2015); Travis Drake et al., “Ancient Low-molecular-weight Organic Acids in Permafrost Fuel Rapid Carbon Dioxide Production upon Thaw,” *Proceedings of the National Academy of Sciences of the United States of America* 112.45 (2015): 13946–51.

²⁸ National Snow and Ice Data Center, “Methane and Frozen Ground,” *All about Frozen Ground* Online: <https://nsidc.org/cryosphere/frozenground/methane.html> (accessed December 30, 2015).

²⁹ US EPA, “Overview of Greenhouse Gases.”

from the atmosphere. However, destructive insects such as bark beetles and ash borers are thriving in the warmer climate and damaging or destroying entire forests of trees. Thus, the ability of trees to absorb carbon dioxide is actually being severely reduced³⁰ or eliminated altogether.³¹

Vegetation on land³² and phytoplankton in the ocean³³ are responding to warmer temperatures in ways that reduce their net uptake of carbon dioxide. Although their rates of daytime photosynthesis (which removes carbon dioxide from the atmosphere) are increasing, their rates of nighttime respiration (which returns carbon dioxide to the atmosphere) are increasing even faster. The result is a net decrease in the uptake of carbon dioxide and a net decrease in the production of oxygen. Not only does this exacerbate global warming, it may ultimately threaten the availability of oxygen for higher-order species (like us) to breathe. This frightening possibility may be mitigated by the fact that plankton reproduce rapidly and thus might quickly evolve in ways that increase their ability to thrive and take in larger amounts of carbon dioxide.³⁴ The bottom line is that the prognosis is unclear: there are far too many species of plankton,

³⁰ University of Wisconsin-Madison, "Munching Bugs Thwart Eager Trees, Reducing the Carbon Sink," *ScienceDaily* (2015). Online: <http://www.sciencedaily.com/releases/2015/03/150302121609.htm> (accessed March 4, 2015); J.J. Couture, T. Meehan, E. Kruger, and R. Lindroth, "Insect Herbivory Alters Impact of Atmospheric Change on Northern Temperate Forests," *Nature Plants* 1.3 (2015): 15016.

³¹ US National Parks Service, "Forest Health: Mountain Pine Beetle." Online: http://www.nps.gov/romo/learn/nature/mtn_pine_beetle_background.htm (accessed December 31, 2015); USDA Forest Service "Mountain Pine Beetle Epidemic." Online: <http://www.fs.usda.gov/detail/mbr/home/?cid=stelprdb5139168> (accessed December 31, 2015); Ryan DeSantis et al., "Effects of Climate on Emerald Ash Borer Mortality and the Potential for Ash Survival in North America," *Agricultural and Forest Meteorology* 178–9 (2013): 120–8.

³² Umeå University, "Increased CO₂ Concentrations in the Atmosphere Have Altered Photosynthesis of Plants over the 20th Century," *ScienceDaily* (2015). Online: <http://www.sciencedaily.com/releases/2015/12/151207164333.htm> (accessed December 9, 2015); Ina Ehlers et al., "Detecting Long-term Metabolic Shifts Using Isotopomers," *Proceedings of the National Academy of Sciences of the United States of America* 112.51 (2015): 15585–90; Princeton University, "Warm Nights Could Flood the Atmosphere with Carbon under Climate Change," *ScienceDaily* (2015). Online: <http://www.sciencedaily.com/releases/2015/12/151207165741.htm> (accessed December 9, 2015); William Anderegg et al., "Tropical Nighttime Warming as a Dominant Driver of Variability in the Terrestrial Carbon Sink," *Proceedings of the National Academy of Sciences of the United States of America* 112.51 (2015): 15591–6.

³³ University of Leicester, "Failing Phytoplankton, Failing Oxygen," *ScienceDaily* (2015). Online: <http://www.sciencedaily.com/releases/2015/12/151201094120.htm> (accessed December 3, 2015); Yadigar Sekerci and Sergei Petrovskii, "Mathematical Modelling of Plankton–Oxygen Dynamics under the Climate Change," *Bulletin of Mathematical Biology* 77.12 (2015): 2325–53.

³⁴ University of Hawaii at Manoa, "Rapidly Acidifying Waters Pose Major Threat for Southern Ocean Ecosystem," *ScienceDaily* (2015). Online: <http://www.sciencedaily.com/releases/2015/11/151102125452.htm> (accessed November 2, 2015); Claudine Hauri, Tobias Friedrich, and Axel Timmermann, "Abrupt Onset and Prolongation of Aragonite Undersaturation Events in the Southern Ocean," *Nature Climate Change* 6 (2015): 172–6; University of Exeter, "Phytoplankton Like It Hot," *ScienceDaily* (2015). Online: <http://www.sciencedaily.com/releases/2015/12/151217151533.htm> (accessed December 19, 2015); Gabriel Yvon-Durocher et al., "Five Years of Experimental Warming Increases the Biodiversity and Productivity of Phytoplankton," *PLOS Biology* 13.12 (2015): e100232; University of Exeter, "Don't Forget Plankton in Climate Change Models, Says Study," *ScienceDaily* (2015). Online: <http://www.sciencedaily.com/releases/2015/11/151127102337.htm> (accessed December 19, 2015); Daniel Padfield et al., "Rapid Evolution of Metabolic Traits Explains Thermal Adaptation in Phytoplankton," *Ecology Letters* 19 (2015): 133–42.

each of which may respond differently in different conditions, to know what the future will actually hold.³⁵

Many other feedback loops and phenomena, each of which accelerates global warming, have been discovered. For example:

- Microbial activity in soils, which releases carbon dioxide, is increasing.³⁶
- The extinction of large fruit-eating animals in tropical forests leads to a loss of trees since those animals are no longer available to spread tree seeds in their excrement.³⁷
- Shifting global wind patterns and deep ocean currents are driving warm air and water toward the poles where it accelerates the rate of ice melting. As the ice melts, cracks form that allow warm water to penetrate and flow under glacial interiors thus melting them even faster.³⁸
- Freshwater lakes are warming even faster than are the oceans and atmosphere, leading to algal blooms that increase methane emissions.³⁹

It would be comforting to find an equal number of feedback loops and phenomena that act to slow down the rate of global warming. Unfortunately, the fact of the matter is that the vast majority of results point to accelerated warming; it is rare to find a new research result that points to a slowing of the warming. This disturbing trend leads to the intuitive (although not rigorously scientific) conclusion that the current models are underestimating the actual rate of warming. In addition, the fact that we have never before observed global warming of this magnitude leads to the intuitive (and, again, not rigorously scientific) worry that there may be many more feedback loops of which we are currently unaware precisely because we have never before seen warming of this magnitude. In short, although we can make educated inferences about the future, there is a disturbing sense that those inferences might well be grievously understated.

³⁵ Mike Vogt, "Adrift in an Ocean of Change," *Science* 350.6267 (2015): 1466–8.

³⁶ Princeton University, "Dirty Pool: Soil's Large Carbon Stores Could Be Freed by Increased CO₂, Plant Growth," *ScienceDaily* (2014). Online: <http://www.sciencedaily.com/releases/2014/12/141223114233.htm> (accessed December 24, 2014); Benjamin Sulman et al., "Microbe-driven Turnover Offsets Mineral-mediated Storage of Soil Carbon under Elevated CO₂," *Nature Climate Change* 4.12 (2014): 1099.

³⁷ University of East Anglia, "Extinction of Large Animals Could Make Climate Change Worse," *ScienceDaily* (2015). Online: <http://www.sciencedaily.com/releases/2015/12/151218161237.htm> (accessed December 19, 2015); C. Bello et al., "Defaunation Affects Carbon Storage in Tropical Forests," *Science Advances* 1.11 (2015): e1501105.

³⁸ Jane Qiu, "Winds of Change," *Science* 338.6109 (2012): 879–81; Sarah Gille, "How Ice Sheets Melt," *Science* 346.6214 (2014): 1180–1; S. Schmidtko, K.J. Heywood, A.F. Thompson, and S. Aoki, "Multidecadal Warming of Antarctic Waters," *Science* 346.6214 (2014): 1227–31.

³⁹ Washington State University, "Climate Change Rapidly Warming World's Lakes: More than Half World's Freshwater Supplies Measured," *ScienceDaily* (2015). Online: <http://www.sciencedaily.com/releases/2015/12/151216174555.htm> (accessed December 20, 2015); C.M. O'Reilly et al., "Rapid and Highly Variable Warming of Lake Surface Waters around the Globe," *Geophysical Research Letters* 42.24 (2015): 10,773–81.

Observations of the actual rate of global warming corroborate the sense that matters are getting seriously out of hand: the current rate of warming is significantly faster than it has been any time in the past,⁴⁰ and the impacts of this warming are very clearly already upon us.

Climate change

When we speak of the impacts of global warming, we are really talking about *climate change* and its impacts. Climate—that is, long-term weather patterns—is changing in response to the warming in a wide variety of interrelated ways, with differing consequences for different places on Earth.

The oceans are taking the brunt of the consequences. Oceans absorb 90 percent of the excess heat energy trapped by the greenhouse effect,⁴¹ which, in turn, causes warming of the deep ocean interior and disruption of deep ocean currents. Oceans also absorb nearly half of the carbon dioxide that we place in the atmosphere,⁴² which makes the ocean more acidic. Together these two phenomena are changing the global oceanic ecosystem.

Coral and shellfish are declining precipitously because they have difficulties forming shells and skeletons in a warmer and more acidic ocean.⁴³ *Trichodesmium*, a type of cyanobacteria, is currently rapidly overpopulating in response to the changing ocean conditions. In laboratory studies, rapid overpopulation of *Trichodesmium* is followed by a sudden catastrophic die-off when nutrients become overused and thus scarce.⁴⁴ If *Trichodesmium* in the ocean undergoes a similar die-off, it would severely disrupt

⁴⁰ Pacific Northwest National Laboratory, “Earth’s Climate Is Starting to Change Faster, New Research Shows,” *ScienceDaily* (2015). Online: <http://www.sciencedaily.com/releases/2015/03/150309134642.htm> (accessed March 25, 2015); Steven Smith et al., “Near-term Acceleration in the Rate of Temperature Change,” *Nature Climate Change* 5 (2015): 333–6.

⁴¹ NOAA, “Climate Change: Ocean Heat Content” (2014). Online: <https://www.climate.gov/news-features/understanding-climate/climate-change-ocean-heat-content> (accessed December 31, 2015); N.L. Bindoff et al., “Observations: Oceanic Climate Change and Sea Level,” in *Climate Change 2007: The Physical Science Basis*, (eds.) S. Solomon et al. (Cambridge and New York: Cambridge University Press, 2007).

⁴² NOAA, “NOAA, Partners: Earth’s Oceans and Ecosystems Still Absorbing about Half the Greenhouse Gases Emitted by People” (2012). Online: http://www.noaa.gov/news/stories/2012/20120801_esrlcarbonstudy.html (accessed December 31, 2015); A.P. Ballantyne et al., “Increase in Observed Net Carbon Dioxide Uptake by Land and Oceans during the Past 50 Years,” *Nature* 488.7409 (2012): 70–2; C.L. Sabine et al., “The Oceanic Sink for Anthropogenic CO₂,” *Science* 305.5682 (2004): 367–71.

⁴³ R.A. Feely et al., “Impact of Anthropogenic CO₂ on the CaCO₃ System in the Oceans,” *Science* 305.5682 (2004): 362–6; James Orr et al., “Anthropogenic Ocean Acidification over the Twenty-first Century and Its Impact on Calcifying Organisms,” *Nature* 437.7059 (2005): 681–6; University of Hawaii at Manoa, “Rapidly Acidifying Waters Pose Major Threat for Southern Ocean Ecosystem”; Hauri et al., “Abrupt Onset and Prolongation of Aragonite Undersaturation Events in the Southern Ocean,” 172–6.

⁴⁴ University of Southern California, “Climate Change Will Irreversibly Force Key Ocean Bacteria into Overdrive,” *ScienceDaily* (2015). Online: <http://www.sciencedaily.com/releases/2015/09/150901140204.htm> (accessed December 3, 2015); David Hutchins et al., “Irreversibly Increased Nitrogen Fixation in *Trichodesmium* Experimentally Adapted to Elevated Carbon Dioxide,” *Nature Communications* 6 (2015): 8155.

the global oceanic food chain: Trichodesmium is one of the few key species that fix nitrogen and thus form a substantial part of the base of the oceanic food chain.⁴⁵

Meanwhile, the sea level is indeed rising. The United Nations Intergovernmental Panel on Climate Change (IPCC) is predicting a rise of between 0.26 and 0.82 meters (0.8 and 2.7 feet) by the end of this century.⁴⁶ Recent research findings—far too new to have made their way into the intergovernmental reports—predict a much larger sea level rise, perhaps as much as 5 meters (15 feet) in a similar time period.⁴⁷ This much higher prediction comes from a detailed computer simulation that brings together a wide range of considerations including paleoclimatic data, the effects of changes in ocean salinity, the effects of meltwater injection on deep ocean energetics and currents, and new understandings of ice melt rates.⁴⁸

The average sea level has already risen about 20 centimeters (9 inches) since 1880. This is enough to cause immediate impacts⁴⁹ such as salt water intrusion into freshwater aquifers and coastal destruction from higher storm surges. These effects are being felt along coastlines in the United States⁵⁰ and, especially, on highly vulnerable islands such as Kiribati⁵¹ and the Solomon Islands.⁵²

The role of climate change in driving extreme weather events—superstorms, floods, droughts, extreme heat waves, and extreme cold—is frequently misunderstood. Climate change is never the *sole* cause of such events; however, it creates conditions that make weather events become more frequently extreme. The underlying physical causes of this relationship are easy to understand in principle, even if making detailed models of those relationships is difficult.

With global warming, the *number* of storms experienced per year is not likely to change; in fact, it may even get slightly smaller. However, the *strength* of hurricanes and typhoons will change noticeably. Warmer sea surface temperatures and warmer air provide more energy for storms. Increased moisture in the atmosphere provides more

⁴⁵ Richard Feely, Christopher Sabine, and Victoria Fabry, “Carbon Dioxide and Our Ocean Legacy,” NOAA Pacific Marine Environmental Laboratory (2006). Online: <http://www.pmel.noaa.gov/pubs/PDF/feel2899/feel2899.pdf> (accessed July 1, 2014).

⁴⁶ IPCC, *Climate Change 2014: Synthesis Report*, (eds.) R.K. Pachauri and L.A. Meyer (Geneva: IPCC, 2014).

⁴⁷ Sasha Wright, “All Eyes on the Oceans—James Hansen and Sea Level Rise,” *Physics.org* (2015). Online: <http://phys.org/news/2015-09-eyes-oceansjames-hansen-sea.html> (accessed September 5, 2015).

⁴⁸ J. Hansen et al., “Ice Melt, Sea Level Rise and Superstorms,” *Atmospheric Chemistry and Physics Discussions* 15 (2015): 20059–179.

⁴⁹ IPCC, “Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects,” in *Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, (eds.) C. Field et al. (Cambridge and New York: Cambridge University Press, 2014).

⁵⁰ National Center for Atmospheric Research, “Evaluating the Effects of Future Sea Level Rise and Storm Surges along US Coastlines.” Online: <https://ncar.ucar.edu/press/evaluating-the-effects-of-future-sea-level-rise-and-storm-surges-along-us-coastlines> (accessed January 1, 2016); C. Tebaldi, B. Strauss, and C. Zervas, “Modelling Sea Level Rise Impacts on Storm Surges along US Coasts,” *Environmental Research Letters* 7.1 (2012): 014032; R. Pielke Jr. et al., “Normalized Hurricane Damage in the United States: 1900–2005,” *Natural Hazards Review* 9 (2008): 29–42.

⁵¹ Office of the President, Republic of Kiribati, *Kiribati Climate Change Online*: <http://www.climate.gov.ki/category/effects/> (accessed January 1, 2016).

⁵² Simon Albert et al., “Interactions between Sea-level Rise and Wave Exposure on Reef Island Dynamics in the Solomon Islands,” *Environmental Research Letters* 11 (2016): 054011.

water for storms to drop as torrential rainfall.⁵³ These factors, coupled with an observed correlation between warming ocean temperatures and an increase in damaging hurricanes,⁵⁴ lead to a growing consensus that as the climate warms, large storms will get bigger and more destructive. Thus, we can expect to see large superstorms more frequently, not because there will be more storms, but because larger storms will grow much larger.⁵⁵

Over land, storms are expected to become more concentrated and to drop larger amounts of rain.⁵⁶ In general, wet regions will get wetter and experience catastrophic (100-year or greater) flooding.⁵⁷ Dry regions, on the other hand, will get drier and thus become susceptible to extreme droughts. Lightning strikes will become more frequent, which, coupled with conditions caused by drought, will lead to more incidences of uncontrollable wildfires.⁵⁸

The consequences for human health and well-being are many. The US Centers for Disease Control and Prevention are predicting the spread of diseases, both common ones like asthma and cardiovascular diseases and rare ones like infectious tropical and water-borne diseases. They predict growing incidences of illnesses and deaths from extreme heat, malnutrition, and water shortages. And, with living conditions deteriorating in many localities, they predict increased incidences of forced migrations and civil conflicts.⁵⁹ By 2050, the number of climate migrants may reach 200 million people, with the majority being children and the poor.⁶⁰

The quest to trace specific extreme weather events to human-caused climate change is hampered by the complexities of the climate system and by the need to carry out modeling at very small resolutions in order to show direct causality. Current work is aimed at improving the resolution scale (from several hundred square kilometers to 60 square kilometers) and speeding up the computational time needed to make such calculations (from years to weeks or days). This is now allowing specific attribution of some broad-scale events, such as heat waves or cold spells, to climate change, but it is still insufficient to make attributions of small-scale

⁵³ Adam Volland, "In a Warming World, Storms May Be Fewer but Stronger," *NASA Earth Observatory* (2013). Online: <http://earthobservatory.nasa.gov/Features/ClimateStorms/> (accessed January 6, 2016).

⁵⁴ K. Emanuel, "Factors Affecting Tropical Cyclone Power Dissipation," *Journal of Climate* 20 (2007): 5497–509.

⁵⁵ Del Genio, "Will a Warmer World"; University of Toronto, "Global Warming Won't Mean More Storms," *ScienceDaily* (2015). Available online: <http://www.sciencedaily.com/releases/2015/01/150129143040.htm> (accessed January 1, 2016).

⁵⁶ Seung-Ki Min, Xuebin Zhang, Francis Zwiers, and Gabriele Hegerl, "Human Contribution to More-intense Precipitation Extremes," *Nature* 470.7334 (2011): 378–81.

⁵⁷ Yukiko Hirabayashi et al., "Global Flood Risk under Climate Change," *Nature Climate Change* 3 (2013): 816–21.

⁵⁸ O. Pechony and D. Shindell, "Driving Forces of Global Wildfires over the Past Millennium and the Forthcoming Century," *Proceedings of the National Academy of Sciences of the United States of America* 107 (2010): 19167–70; R. Seager et al., "Model Projections of an Imminent Transition to a More Arid Climate in Southwestern North America," *Science* 316 (2007): 1181–4.

⁵⁹ Centers for Disease Control and Prevention, "Climate Effects on Health." Online: <http://www.cdc.gov/climateandhealth/effects/> (accessed January 2, 2016).

⁶⁰ Princeton University, "As Global Temperatures Rise, Children Must Be Central Climate Change Debates," *ScienceDaily* (2016). Online: <https://www.sciencedaily.com/releases/2016/05/160504121330.htm> (accessed May 5, 2016).

phenomena such as hurricanes or localized rainfall events.⁶¹ It is important to note, however, that the current inability to directly attribute extreme weather events to human-caused climate change is not evidence that no such links exist. Rather, it is merely evidence that our ability to trace through the fine-scale details involved is still nascent.

Pope Francis, writing in his papal encyclical *Laudato Si'*, aptly sums up the situation:

A very solid scientific consensus indicates that we are presently witnessing a disturbing warming of the climatic system. In recent decades, this warming has been accompanied by a constant rise in the sea level and, it would appear, by an increase of extreme weather events, even if a scientifically determinable cause cannot be assigned to each particular phenomenon. Humanity is called to recognize the need for changes of lifestyle, production and consumption, in order to combat this warming or at least the human causes which produce or aggravate it.⁶²

Solutions

Pope Francis says very clearly that we must convert to renewable sources of energy and develop better capacities for storing energy.⁶³ However, he leaves open the question of how far we should go in this regard and how fast we should do it. This omission is appropriate because debates over the levels to which we should allow the warming to proceed or the pace at which we should reduce greenhouse gas emissions⁶⁴ distract attention from the key point: it will take a very long time for carbon dioxide in our atmosphere to return to preindustrial levels. Most of the excess carbon dioxide will remain for at least hundreds or thousands of years, and some will remain for tens of thousands or even hundreds of thousands of years.⁶⁵ The only reasonable solution, therefore, is to stop *all* carbon emissions and stop them *now*: keep all of the remaining carbon in the ground.

The cost of delay is profound. With every ten years of delay in reducing greenhouse gas emissions, the peak warming temperature will increase by about 0.5 degrees Celsius. In other words, the actions taken today to limit global warming to 2 degrees

⁶¹ Warren Cornwall, "Efforts to Link Climate Change to Severe Weather Gain Ground," *Science* 351.6279 (2016): 1249–50; National Academies of Sciences, Engineering, and Medicine, *Attribution of Extreme Weather Events in the Context of Climate Change* (Washington, DC: The National Academies Press, 2016); NOAA, "Human-caused Climate Change Increased the Severity of Many Extreme Events in 2014," *ScienceDaily* (2015). Online: <http://www.sciencedaily.com/releases/2015/11/151107202528.htm> (accessed December 30, 2015); S. Herring et al. (eds.), "Explaining Extreme Events of 2014 from a Climate Perspective," *Special Supplement to the Bulletin of the American Meteorological Society*, 96.12 (2015).

⁶² Pope Francis, *Laudato Si': On Care for Our Common Home* (The Holy See: Vatican Press, 2015), §23.

⁶³ *Ibid.*, §26.

⁶⁴ UN Conference on Climate Change (COP21). Online: <http://www.cop21.gouv.fr/en/more-details-about-the-agreement/> (accessed December 30, 2015).

⁶⁵ David Archer et al., "Atmospheric Lifetime of Fossil Fuel Carbon Dioxide," *Annual Review of Earth and Planetary Sciences* 37 (2009): 117–34.

Celsius, would, if taken ten years hence, limit the warming to only 2.5 degrees Celsius. The extra “push” we give to global warming during the years of delay makes it that much harder to ultimately stop the warming.⁶⁶

Is it possible to change our energy production entirely to renewable sources? The US Department of Energy’s National Renewable Energy Laboratory (NREL) thinks so: “Renewable electricity generation from technologies that are commercially available today, in combination with a more flexible electric system, is more than adequate to supply 80 percent of total US electricity generation in 2050.”⁶⁷ In making this assessment, the NREL assumed a future in which half of the energy needs would be supplied by solar and wind power, with the rest coming from a combination of biomass, geothermal, and hydropower. These sources would have to be supported by much greater attention to energy efficiency, development of a more flexible and efficient energy transmission system, and development of better energy storage capacity. They did not take into account the very real probability that vast technological improvements in these and other renewable energy generation methods will occur in the next few decades. As such technologies develop, the prospects for converting completely to renewable energy grow ever higher, particularly since the costs for renewable energy are declining precipitously and the rates of new installations are increasing rapidly.⁶⁸

The problem, then, is not one of technology; it is a problem of changing human-devised systems. We have become reliant upon a vast infrastructure for delivering energy from fossil fuels: an interlocking electrical grid, a plethora of gasoline stations, and a vast network of oil and natural gas pipelines. In order to replace fossil fuels with renewable sources of energy, we have to rebuild our systems of energy delivery. In particular, the electric grid has to be made able to accept input of electricity from a widely distributed array of solar, wind, and hydroelectric sources, and it has to be able to compensate for times when the Sun is not shining and the wind is not blowing. Ways to store massive amounts of electrical energy for use at later times then become essential. It is also a problem of adapting the human-made economic, regulatory, and social systems that have been built upon the premise of readily available energy from fossil fuels.

The essential question, therefore, is: *Do we have the societal will necessary to make the economic, social, regulatory, and energy infrastructure changes needed to convert to renewable energy?* Bill McKibben, writing in the *New Republic*, asserts that the climate crisis is akin to a World War and that a wartime reindustrialization is necessary in order to win the war against climate change.⁶⁹ Although this sounds like hyperbole, it

⁶⁶ University of Bern, “Timely Action Needed to Meet Climate Targets,” *ScienceDaily* (2016). Online: <http://www.sciencedaily.com/releases/2016/01/160121093151.htm> (accessed January 22, 2016); Patrik Pfister and Thomas Stocker, “Earth System Commitments Due to Delayed Mitigation,” *Environmental Research Letters* 11.1 (2016) <http://iopscience.iop.org/article/10.1088/1748-9326/11/1/014010/meta> (accessed January 22, 2016).

⁶⁷ M.M. Hand et al. (eds.), *Renewable Electricity Futures Study* (Golden, CO: National Renewable Energy Laboratory, 2012).

⁶⁸ US Department of Energy, *Revolution Now—2016 Updates*. Online: <http://energy.gov/eere/downloads/revolutionnow-2016-update> (accessed October 5, 2016).

⁶⁹ Bill McKibben, “A World at War,” *New Republic* (2016). Online: <https://newrepublic.com/article/135684/declare-war-climate-change-mobilize-wwii> (accessed August 17, 2016).

is unfortunately true. A massive restructuring of lifestyles and an intense national (and international) focus is indeed necessary to ward off the worst effects of climate change.

With the tremendous leverage provided by *Laudato Si'*, the landmark agreements reached at the 2015 United Nations Conference on Climate Change,⁷⁰ and the growing interest in sustainable lifestyles, we are beginning to move in the right direction. However, a much more rapid and serious effort is necessary if we are to win this war.

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⁷⁰ COP21 (2015), "195 Countries Adopt the First Universal Climate Agreement." Online: <http://www.cop21.gouv.fr/en/195-countries-adopt-the-first-universal-climate-agreement/> (accessed January 31, 2016).

Part One

Culture

Ecotheology before Ecology and Environmentalism: Reclaiming the Missing Heritage of Natural Theology

Christopher Hamlin

With few exceptions, the religious, and particularly the Christian, response to environmental problems has been accorded a short history. A distinct ecotheological literature seems to arise only in the second half of the twentieth century, when growing awareness of the global environmental crisis spawned the variety of social movements known collectively as “environmentalism,” as well as an associated investment of authority (and anxiety) in ecology and kindred environmental sciences. These are the primary institutions for both understanding and responding to this situation. Theology, and religion more generally, has played a subsidiary role: it may facilitate that work but only after a substantial retooling of received understandings regarding the relations among God, humanity, and the cosmos. The view that the history of Christian theology had little to contribute, and was even an embarrassment, reflects a quick capitulation to the early intervention of the eminent medievalist Lynn White, who in 1968 charged the anthropocentric Judeo-Christian faiths with chief responsibility for the modern “ecologic crisis.” White’s brief and sweeping assessment, delivered to the American Association for the Advancement of Science and published in its widely read weekly *Science*, prompted a flurry of theological (chiefly Protestant) response, the seeds of what would become ecotheology.¹

But why, one might ask, was there need for that planting? White held that the sages of these faiths, preoccupied with metaphysics, afterlives, or the niceties of doctrine, had been uninterested in matters pertaining to life on Earth. That remained the province of other traditions, including various pagan traditions. While I shall argue that White, for whom St. Francis of Assisi was the only serious exception, had failed

¹ Lynn White, Jr., “The Historical Roots of Our Ecologic Crisis,” *Science* 155.3767 (1967): 1203–7. The foremost chronicler of White’s impact has been Elspeth Whitney, “Lynn White, Ecotheology, and History,” *Environmental Ethics* 15.2 (1993): 151–69; Whitney, “Changing Metaphors and Concepts of Nature,” in *Religion and the New Ecology: Environmental Responsibility in a World in Flux*, (eds.) David Lodge and Christopher Hamlin (Notre Dame, IN: University of Notre Dame Press, 2004), 26–52; Whitney, “The Lynn White Thesis: Reception and Legacy,” *Environmental Ethics* 35 (2013): 3130–1.

to do his historical homework, he was probably accurately reflecting the mainstream Christianity of his day, at least in America.

Mid-century Christianity's sphere of authority reflected a division of intellectual labor that had taken place during the nineteenth century. At the beginning of that century, many theologians still understood themselves as authorities over the character and vicissitudes of the cosmos, at least in broad terms. By its end, most did not. These had become the territory of scientific disciplines; whatever comprehensive explanation they offered was likely naturalistic, if not emphatically materialistic, and disconnected from any clear transcendent moral explanation of the sort that might guide human interactions with nature. In America, at the time of White's writing, authority respecting these interactions came from diffuse remnants of romanticism and the frontier ethos, progressivist resource management, and the outdoor recreation community.² No distinct institution sanctioned systematic personal inquiry into human accountability for (and equally to) nature. Elsewhere, the authority came from other cultural resources, but the result was much the same.

My depiction of a division, of course, assumes a prior unity. If so, it was hardly an uncomplicated one. First, in the Abrahamic religions, the legacy of the Creation as a designed entity to and for which both God and humans are accountable is complicated by a series of subsequent events: by the Fall, by the drowning of the world and the resulting new covenant, by the giving of laws, and ultimately by the Christian dispensation.³ Of these, the Fall has been the most important touchstone in thinking about accountability from and to nature. Not only has the Augustinian sense of living in a fallen world created ambivalence toward the world we experience, it also has raised the cognitive problem of distinguishing the created from the fallen, a matter Peter Harrison has extensively explored.⁴

Beyond this quasi-paleontological problem of tying particular aspects of the world we experience to particular layers of Biblical history lies the broader problem of how God governs. Only when we know that can we know what "nature" is or whether there is even need at all for that ambiguous term (or for that other ambiguous, "God"). Some have regarded God as immediately and entirely responsible in the creation and sustaining of the cosmos, and thus in everything that has ever taken place. Others held that nature, while created (at least in part), was effectively self-acting. Hence, most of what has occurred in the cosmos was the determined result of interacting material entities whose properties God was in some sense responsible for, but over which He no longer exercised direct supervision. That such different positions could be included under one roof is extraordinary, given their contrasting implications with regard to accountability. In the former position, known in various contexts as "voluntarism" or "occasionalism," there is effectively no nature. In the latter "intellectualist" or

² Stephen Fox, *The American Conservation Movement: John Muir and His Legacy* (Madison: University of Wisconsin Press, 1981).

³ My focus is on the history of Western Christianity. Other Abrahamic heritages—represented in Judaism, orthodox Christianity, and Islam—are sufficiently distinct that it is impossible to explore them here.

⁴ Peter Harrison, *The Fall of Man and the Foundations of Science* (Cambridge: Cambridge University Press, 2007).

“Platonist” position (though these terms are admittedly problematic), nature’s doings do not necessarily have anything to do with any human’s relation with the divine.⁵ Usually, quiet compromises have been the rule. One is that God governs actively, but usually lawfully, with occasional suspensions of laws recognizable as miracles. Another has been to represent the Creation more as arranging than creating per se. But any simple dichotomy between primary and secondary causation is likely to miss much, and consistency is rare. More common are dual creation models, where later and more specific aspects of creation are fit into earlier more general aspects. The Hexamaeral homilies of the physics-minded St. Basil of Caesarea offer a good example, and Kant develops the problem more generally in the *Critique on Judgment*.⁶

Much of this compromising reflects the work of the post-Nicene fathers, most strikingly Arnobius, the Cappadocians, Lactantius, and, later, Augustine, who were concerned with the problem of how to respond to a pantheistic pagan religion and philosophy in which divine accountability was a prominent concern.⁷ Their results were generally successful. For much of the time, religious writers and thinkers, and presumably the laity who looked to them for authoritative answers, could effectively take the world for granted: either all was God’s direct will in which case there was no basis for quibbling, or it reflected a domain in which God chose not to be (or even could not be) actively engaged.⁸ Questions arose only when the world seemed particularly unsatisfactory, as in the arrival of a pestilence or in the trials of a Job.⁹

By the early modern period, the well-known argument from design (what may be called empirical or *aposteriori* natural theology) provided systemic reassurance that, whatever the actual mechanics of divine management might be, nature was the main showpiece of God’s work—and, accordingly, a test case for discussions of divine accountability.

Usually, design arguments are seen as attempts to prove God’s existence. Philosophers have found them wanting. Hume critiqued their circularity, noting that they cannot function as proofs until there is already agreement on what sort of God is to be proved, while Kant noted the limitations of humankind’s understanding of the infinite and ushered in an era of transcendent theology, which largely bypassed the details of human experience of nature.¹⁰ But many theologians needed no convincing.

⁵ Antony Flew, *God and Philosophy* (New York: Harcourt, Brace, and Co., 1966); Eugene Klaaren, *Religious Origins of Modern Science: Belief in Creation in Seventeenth Century Thought* (Grand Rapids: Eerdmans, 1977).

⁶ Saint Basil, *Exegetic Homilies*, trans. Sr. Agnes Clare Way (Washington, DC: Catholic University Press, 1963); Immanuel Kant, *Critique of Judgement*, trans. J.H. Bernard (New York: Hafner, 1951).

⁷ Jaroslav Pelikan, *Christianity and Classical Culture: The Metamorphosis of Natural Theology in the Christian Encounter with Hellenism* (New Haven: Yale University Press, 1993); Clarence Glacken, *Traces on the Rhodian Shore: Nature and Culture in Western Thought from Ancient Times to the End of the Eighteenth Century* (Berkeley: University of California Press, 1969).

⁸ One should not overstate. Such matters were delicate and often a source of heresy over concerns about undue dualism. See John Hick, *Evil and the God of Love* (San Francisco: Harper and Row, [1966] 1978).

⁹ Mark Larrimore, *The Book of Job: A Biography* (Princeton: Princeton University Press, 2013).

¹⁰ Flew, *God and Philosophy*; David Hume, *An Inquiry Concerning Human Understanding*, (ed.) Charles Hendel (Indianapolis: Bobbs-Merrill, 1955); David O’Connor, *Hume on Religion* (London: Routledge, 2001); Kant, *Critique of Judgement*.

For a wide range of reasons—triviality, inadequacy, impiety, and distraction from the more immediate matters of salvation—orthodox theologians were often dismissive. Recent theologians and historians have largely concurred. Karl Barth, representing the reformed tradition, is often singled out as the most vehement critic—the design arguments of puny humans pretending to reason for God reeked of arrogance.¹¹ Within a Catholic framework, the historian Michael Buckley arrived at a complementary view, noting the lack of Christology in natural theology and its seamless relation to Enlightenment rationalism.¹² In similar fashion, the literary historian Colin Jager saw this form of natural theology as the leading edge of a secularization that fragmented human experience into the disciplines that characterize modernity.¹³

Indeed, by the end of the nineteenth century, theology had itself become a discipline, just like the discipline-bound sciences of nature. But the emerging distribution of inquiries to disciplines left untenanted a large domain of seminal, if perhaps unanswerable, questions, those “why” questions regarding the incomprehensible ways of the world whose tentative answers affect our engagement with it: what we perceive as normal or as pathological, what we admire or revile, and equally how we practice responsible living in a “common home.”

That vacant domain is evident in the curious bifurcation of “cosmology” in the modern Western world. As used by anthropologists, the term refers to the ethnographic (descriptive) study of what is largely a normative domain—how humans of some other culture (i.e., one that does not train anthropologists) think the cosmos works and how they should fit into it. Applied to our culture, the term refers to the descriptive and analytical study of a domain of astrophysics.¹⁴ (Theologians, notes one of our editors, hope to bridge this gap, studying their own cosmologies from within.)

Or consider the fate of “theodicy,” a term coined by Leibniz in 1710 to refer to the problem of justification, applied particularly to the question of how an omniscient, omnipotent, and benevolent god could allow evil. Then and now human-nature interactions were central parts of such inquiries—we ask “why” of great storms, droughts, epidemics, and pestilences, or scarcities and maldistributions of needed resources. Or more specifically, “Would the good God allow humans to overrun the world and dangerously destabilize the world’s climate?” Yet in a 1791 essay “On the Failure of All Attempted [and, by insinuation, all future] Philosophical Theodicies,” Kant advised his fellow philosophers to give up the project.¹⁵ He saw no way to justify

¹¹ John Dillenberger, *Protestant Thought and Natural Science: A Historical Interpretation* (Notre Dame, IN: University of Notre Dame Press, 1988). There have been recent protests that Barth’s hostility does not adequately represent the reformed tradition. See Susan Schreiner, *Theater of His Glory: Nature and Natural Order in the Thought of John Calvin* (Durham, NC: Labyrinth, 1991); Michael Sudduth, *The Reformed Objection to Natural Theology* (Burlington, VT: Ashgate, 2009).

¹² Michael Buckley, *At the Origins of Modern Atheism* (New Haven: Yale University Press, 1987).

¹³ Colin Jager, *The Book of God: Secularization and Design in the Romantic Era* (Philadelphia: University of Pennsylvania Press, 2007).

¹⁴ Stephen Toulmin, *The Return to Cosmology: Postmodern Science and the Theology of Nature* (Berkeley: University of California Press, 1982).

¹⁵ Immanuel Kant, “On the Failure of All Attempted Philosophical Theodicies,” in *Kant on History and Religion*, (ed.) Michel Despland (Montreal: McGill-Queen’s University Press, 1973), 283–97.

the justifications. Two centuries later, theodicy has largely been banished from the academy, existing only as an outlier of the philosophy of religion, and even there sometimes despised as an insult to the human experience of suffering.¹⁶ Yet, however easily they may be dismissed as “adolescent,” these “why” questions are still asked, and some philosophers are beginning to recognize that they have been more central than conventional accounts of the history of philosophy acknowledge.¹⁷ The asking and answering occurs either as a private matter or one on which self-appointed authorities pontificate. The insoluble problem of natural evil lives on in pastoral settings too. A pastor in a hospital setting, for example, will often hear an appeal for cosmic explanation. Even though there may be no convincing answer, simply to acknowledge the validity of the question will itself be important. Such unaccredited answering matters: not only is it an important part of moral identity—thus guilt about personal carbon budgets may be among our private responses to the problem of theodicy—but it also carries enormous political power, far more perhaps than accredited answering.

The hope that science, more broadly diffused, can (and should) displace demands that the cosmos be meaningful is both naive and counterproductive in addressing “common home” issues. It relies on a category error—the assertion that nonnormative forms of inquiry, concerned with objectively delineating the workings of the world, will be applicable to the normative and subjective problem of determining the meaning of each person’s own situatedness. It fails to acknowledge that it is the quest for meanings—these private (and communal) reconciliations with reality—that animate those “home”-making actions that comprise the public’s response to environmental conditions. And it is counterproductive, too, in its arrogance: my own experience, echoed by other teachers of environmental matters, is that however great their shock value, the facts-first approaches of “inconvenient truths” often engender bewilderment and despair (or denial and distrust), largely because they are insufficiently person-centered, existential.

Here, however, my concern is with an empirical error: the belief that no critical, non-facile body of discussion exists that unites these public and private, objective and subjective, descriptive and normative, phenomenal and noumenal (or numinous) domains of inquiry. For some time, historians of science have denied any inherent opposition between science and religion. Plainly false for most of history, such a claim emerges only in the late nineteenth-century university politics.¹⁸ But, particularly for recent science, we have rarely gone further to explore how far theodicy- or cosmology-based inquiries underpin inquiries into the world’s workings. The environmental sciences, comprehensive in scope and often linked to public sensibility and public action, are an ideal case.

¹⁶ Terrence Tilley, *The Evils of Theodicy* (Washington, DC: Georgetown University Press, 1991).

¹⁷ Susan Neiman, *Evil in Modern Thought: An Alternative History of Philosophy* (Princeton: Princeton University Press, 2002). See also “Holiday in Hellmouth,” *The New Yorker*, June 9, 2008. Online: <http://www.newyorker.com/magazine/2008/06/09/holiday-in-hellmouth> (accessed September 20, 2016).

¹⁸ Ronald Numbers, *Galileo Goes to Jail and Other Myths about Science and Religion* (Cambridge, MA: Harvard University Press, 2009).

A literature search not tied to recent terms—“environment” and “ecology”—reveals the deep roots of “common home” issues in natural theology.¹⁹ These have been neglected, partly because the arguments of natural theology have been mischaracterized as having to do with God’s existence rather than with the divine attributes evident in the biogeochemical functioning of the cosmos (the issues of cosmology and theodicy); and partly because of the entanglement of natural theology in the legacy of Charles Darwin. There it is often depicted not as one of several frameworks that organized his inquiries but as the “theory” he refuted in positing evolution by natural selection.²⁰ Since Darwin is also often credited with a foundational role in the emergence of ecology,²¹ this exclusion of natural theology from his achievement has further alienated it from narratives of scientific progress. Mistakenly conflated with “Creationism,” it is taken as the antithesis of any rigorous environmental science, a denial of natural dynamism, and naive wishful thinking.

In the remainder of this chapter, I highlight a few “common home” themes taken from eighteenth- and nineteenth-century Protestant natural theology in the works of three authors. One, William Paley (1743–1805), is the common target in the Darwin literature. Often his *Natural Theology* (1802) is made to stand in for natural theology in general (which was in fact a diverse literary enterprise and not properly a theory at all). Darwin, however, credited the work in helping frame his enquiries into the origin of species.²² The others are more obscure. Christoph Christian Sturm’s (1740–1786) 1772 devotional almanac, *Betrachtungen über die Werke Gottes im Reiche der Natur und der Vorsehung auf alle Tage des Jahres* (or *Reflections on the Works of God in Nature for Each Day of the Year*), was a digest of Lutheran natural theology but a best seller in many languages and across many confessions in the first third of the nineteenth century. Now forgotten, Sturm was at least as popular as Paley. Last is John MacCulloch (1773–1835), an iconoclastic physician-geologist, author of a three-volume 1800-page

¹⁹ Here I follow Udo Krolzik, who notes five anticipations of ecology in natural theology: a concern with research into detail, a concern with large-scale connections, the displacement of deductive approaches by experiment and observation, the emphasis on the unity of nature among all its variety, and the emphasis on harmony and balance in nature. Udo Krolzik, “Das Physikotheologische Naturverständnis und Sein Einfluß Auf Das Naturwissenschaftliche Denken Im 18. Jahrhundert,” *Medizinhistorisches Journal* 15.1/2 (1980): 90–102; Krolzik, *Säkularisierung der Natur: Providentia-Dei-Lehre und Naturverständnis der Frühaufklärung* (Neukirchen-Vluyn: Neukirchener Verlag des Erziehungsvereins, 1988).

²⁰ Compare Philip Kitcher, *Living with Darwin: Evolution, Design, and the Future of Faith* (Oxford: Oxford University Press, 2007), 8–9; and Francisco Ayala, *Darwin’s Gift to Science and Religion* (Washington, DC: Joseph Henry Press, 2007) with work by many Darwin scholars: James Moore, “Darwin of Down: The Evolutionist as Squarson-Naturalist,” in *The Darwinian Heritage*, (ed.) David Kohn (Princeton: Princeton University Press, 1985), 435–81; Moore, “Darwin’s Ambiguity: The Secularization of Biological Meaning,” *British Journal for the History of Science* 22 (1989): 215–39.

²¹ With the exception of Frank Egerton, many historians have been uneasy with recognizing precedents before Spencer and Darwin. Thus, compare Joel Hagen, *The Entangled Bank: The Origins of Ecosystem Ecology* (New Brunswick, NJ: Rutgers University Press, 1992) with Frank Egerton, “Changing Concepts of the Balance of Nature,” *Quarterly Review of Biology* 48 (1973): 277–350; Mark Stoll, “Creating Ecology: Protestants and the Moral Community of Creation,” in *Religion and the New Ecology: Environmental Responsibility in a World of Flux*, (eds.) David Lodge and Christopher Hamlin (Notre Dame, IN: University of Notre Dame Press, 2006), 53–72.

²² Charles Darwin, *Autobiography*, (ed.) Nora Barlow, vol. 29 of *The Works of Charles Darwin* (London: William Pickering, 1989), 101; see also 120.

Proofs and Illustrations of the Attributes of God, from the Facts and Laws of the Physical Universe, complete by 1830. It is by far the most sophisticated work of general natural theology in the decade before Charles Darwin began his serious theorizing. Darwin was one of his few readers—but only, evidently, of parts of volume one.²³

None of these authors was a lightweight. Sturm ended his career as high pastor in Hamburg, Paley has been called the most important English philosopher of his era, and the polymath MacCulloch produced the first geological map of Scotland and is known as the founder of malariology.²⁴ While each writes “natural theology,” their works differ significantly. Sturm’s is pastoral, existential, and often doxological. Paley is argumentative, anticipating criticisms to natural theology, suggesting responses to them. MacCulloch is inductive. His “God” is an under-defined entity whose attributes are to be inferred from a critical review of contemporary science. As to relations among these authors, Sturm was among Paley’s many sources; MacCulloch is critical of Paley-style natural theology.

Before examining them, one more issue needs addressing: natural theology’s alleged anthropocentrism, which led White to blame the Judeo-Christian heritage for the “ecologic crisis.” If indeed natural theology can be seen merely as an ideological exercise to find cosmic vindication for whatever ethnic, national, gender, class, or religious identity a writer represents, we need not take it seriously. It can be. One need only point to the early parts of Genesis. One could pluck passages from each of these authors that would support such a view. Yet they would be atypical. And we need to read them in terms of the world these writers (and their presumed readers) understood and experienced, one of plagues, pestilences, floods, and storms, and in which the Fall was a far more immediate touchstone than the heady optimism of Genesis 1. Allusions to a world created for humans are often less commands to world-making than efforts to include some partial goods among plentiful evils. For usually, the writer’s main concern is simply to assure the reader that world is being looked after, no matter what is happening in it. Often, and particularly in Germany, the Book of Job (particularly its penultimate chapters) was more immediate than the Creation. There, speaking from the whirlwind, Jehovah taxes Job with a series of rhetorical questions whose collective implication is biocentric; the world evidently does not exist to meet Job’s needs.²⁵ Natural theologians must accept such challenges: their chief antithesis is a devil-may-care apathy; a view that one need not act and there is nothing to invest hope in because there is no meaning and nothing matters. This for them is the essence of irreligion.²⁶

²³ Charles Darwin, “Notes on MacCulloch,” *Darwin Online* (1838). Online: <http://darwin-online.org.uk/content/frameset?pageseq=4&itemID=CUL-DAR205.5.28-29&viewtype=side> (accessed January 27, 2017).

²⁴ Jacob Friedrich Feddersen, *Christoph Christian Sturms. Leben und Charakter* (Hamburg: J.H. Herold, 1786); D. LeMahieu, *The Mind of William Paley: A Philosopher and His Age* (Lincoln: University of Nebraska Press, 1976); L.J. Bruce-Chwatt, “John MacCulloch, M.D., F.R.S. (1773–1835) (The Precursor of the Discipline of Malariology),” *Medical History* 21.2 (1977): 156–65.

²⁵ Larrimore, *The Book of Job*; Susan Schreiner, *Where Shall Wisdom Be Found?: Calvin’s Exegesis of Job from Medieval and Modern Perspectives* (Chicago: University of Chicago Press, 1994); Jonathan Sheehan, *The Enlightenment Bible: Translation, Scholarship, Culture* (Princeton: Princeton University Press, 2007).

²⁶ Peter Harrison, *The Territories of Science and Religion* (Chicago: University of Chicago Press, 2015).

I shall touch on four issues in this essay, all anticipations of later public issues of ecotheological importance: biodiversity, human population limits, cyclicity, and anthropogenic destabilization.

Biodiversity

Why do species exist? Generally, existence (Creation) is reason enough. Questions arise not only with regard to species that hamper human endeavors but also about those that seem to duplicate some function or niche unnecessarily.

In his entry for May 27, Sturm asks his reader: “Does anyone think that no rapacious animals should exist upon the earth?” He answers by invoking the balance of nature:

Let such people reflect that, by the beasts of prey, the number of animals which would be troublesome to us is diminished. ... The animals thus devoured are replaced by others, and the population is regulated by the means of subsistence; hence flies and many insects would perish from want, if the animals which feed upon them did not thin their numbers.²⁷

Sturm here mixes an anthropocentric reference point with broader conceptions of ecosystem services.

Later, addressing complaints about agricultural pests—“the insatiable sparrow and the greedy raven!”—he challenges the very need to defend existence from those “who seem to imagine that certain animals only exist to torment mankind.” To be sure, we may be “pleased to see the animals which are mischievous to us destroy one another,” yet such a view displays anthropocentric arrogance: “We think we may without injustice deprive animals of life, either of our food or any other purpose; but we cannot bear that they should take any thing from us. But have we more right to take away the life of a gnat, than it has to take a drop of our blood?” Then he returns to ecosystem services: “Besides, in complaining of the voracity of animals, we do not consider that this arrangement of nature is not so disadvantageous [Considering] the animal kingdom from an enlarged point of view ... [w]e ... find, that many species of animals, birds, or insects, apparently hurtful, are on the contrary of great utility.” Referencing an attempt by American colonies to destroy jays, he notes that “the number of jays was scarcely diminished, when immense numbers of worms, caterpillars, etc. ravaged their cornfields. They immediately stopped the persecution of the jays; whose numbers again increasing, soon put an end to the plague.” Returning to an ethical vein, he questions humans’ unwillingness to share: “Why should we be so selfish as to wish to deprive animals of the provisions necessary for their subsistence?” After all, we can’t eat everything: “And do we find any deficiency in our sustenance or our pleasures, because birds, insects, and a few animals, partake with us of the blessing which God has so bountifully bestowed?” His conclusion: “Every thing is connected in the vast

²⁷ Christoph Christian Sturm, *Sturm’s Reflections on the Works of God, and His Providence Throughout All Nature* (Philadelphia: Woodward, 1832), 185–6.

kingdom of nature; no creature is useless, or is placed there without an end, though we are ignorant of the destination of many animals.”²⁸

William Paley challenges a similar presumption. Some, he notes, complain that the oceans are too big. He describes his predecessors’ utilitarian responses (which are indeed remarkable as instances in which natural theology invited fruitful hypothesizing), involving the interrelation of heat, winds, and evaporation in which large oceans were deemed essential to God’s presumed goal of making continental interiors habitable. Paley, however, rejects their premise, partly on grounds of biodiversity. “I know not why the sea may not have as good a right to its place as the land. It may proportionably support as many inhabitants; minister to as large an aggregate of enjoyment. The land only affords a habitable surface; the sea is habitable to a great depth.”²⁹

Paley is here employing a plentitude argument: life is good, more life is better, it matters little what type of life it is. Elsewhere he does so more explicitly. Thus, he ascribes the “insatiable variety” of insects to the variety of habitats (niches), anticipating Gause’s competitive exclusion principle: “Did all animals covet the same element, retreat, or food, it is evident how much fewer could be supplied and accommodated, ... What one nature rejects, another delights in. ... Carrion is a treat to dogs, ravens, vultures, fish. ... Maggots revel in putrefaction.”³⁰ Plentitude arguments, deriving from Plato, had been applied to theodicy chiefly by Archbishop William King, in his 1701 *Essay on the Origin of Evil*.³¹ Anticipating modern concepts of ecosystemic health, King and Paley hold that diversity allows more life to exist. Since each existence is a quantum of good, diversity maximizes the good of the universe.

In a reverie on the animate life within a few square miles of Lapland, MacCulloch, following Linnaeus, similarly asserts plentitude. That space

will contain, in one day, more lives of this kind (gnats) than all the great terrestrial races united. ... The mind becomes confused in [contemplating] ... such crowds of beings; ... each ... a distinct consciousness, with all the self-will, the desires, and the happiness, permitted to its kind; constituting an individuality of mind, and a conviction of existence, of liberty, of space, and time, and, power, and enjoyment, and choice, as perfect as that of man himself: a thinking being, because it is a living one.³²

Biodiversity here is predicated on consciousness, but many natural theologians would extend this gift widely, delighting in plant trophisms, which they treated as a kind of consciousness.³³

²⁸ Ibid., 288–9.

²⁹ William Paley, *Natural Theology in The Works of William Paley, D.D., New Edition in One Volume* (Philadelphia: Crissy and Markley, n.d.), 456.

³⁰ Ibid., 450.

³¹ William King, *Essay on the Origin of Evil* (London: Thurlbourn, 1731), 86–93; Arthur Lovejoy, *The Great Chain of Being* (New York: Harper & Row, 1960).

³² John MacCulloch, *Proofs and Illustrations of the Attributes of God, from the Facts and Laws of the Physical Universe: Being the Foundation of Natural and Revealed Religion* (London: James Duncan, 1837), 3, 75–6.

³³ E.g., *ibid.*, 1.462.

Overpopulation

Predator–prey balance fascinated many natural theologians. But where did humans fit in? Though they differ as to how crowded they perceived the world to be, both pre- and post-Malthusian natural theologians did recognize the destabilizing potential of human overpopulation. Drawing on the contemporary demographer (and fellow Lutheran pastor) Johann Peter Sussmilch (1707–1767), whose *Die göttliche Ordnung in den Veränderungen des menschlichen Geschlechts, aus der Geburt, dem Tode und der Fortpflanzung desselben* (i.e., *The Divine Rule of the Variation of Human Generation, in Terms of Birth, Death, and Reproduction*) suggests its natural theological character by its title alone, Sturm noted the gradual increase of population, coupled with the stable proportion of births to deaths over time, as a sign of God’s “most tender solicitude for the life of man.” Among those wise provisions, however, was the symmetry of the mortality curve: high in infancy, then low throughout adolescence and middle age, then high again in old age. And also the occasional intervention of natural disasters: “Pestilence and famine sweep off a number of wicked people from the earth; and the extraordinary mortality which sometimes prevails ... is a very wise means to ... prevent their population being too great.” Not all victims are so wicked, Sturm must admit.³⁴

The arch-Malthusian MacCulloch held similar views. He noted, as would Darwin, the tendency of animal species to overpopulate: “The fecundity of man errs in practice, as does that of all other animals; ... whence there arise, at certain periods and ... places, excesses of population, because the adaptations and corrections are not perfect or efficient.” These, he argued, were anticipated parts of the created order, “Since He [God] has made provision to meet them by ordaining mortal and extensive diseases, and [does so] ... wherever mankind becomes condensed.”³⁵ It is easy to forget that these thinkers were living in an age powerless to stop many forms of high mortality episodes; that these, whether famines or epidemics, were often tied to scarcity; and that there was little prospect of new technologies to increase subsistence.

Paley approaches human expansion in terms of species’ rights to habitat. He complains of value-laden terms that pervert biological facts: so-called blights were “often times, legions of animated beings, claiming their portion of the bounty of nature.” Each species had its legitimate territory, and if our invasion of those territories caused us problems—from “bites and stings” or ravenous beasts—that was our fault; these arose from misguided efforts, usually arising from “folly and wickedness,” to occupy “situations upon the earth, which do not belong to [us].” Better to let these “wild beasts and venomous reptiles ... enjoy their existence; ... have their country. Surface enough will be left to man, though his numbers were increased a hundred-fold.”³⁶

³⁴ Sturm, *Sturm’s Reflections on the Works of God*, 379–82.

³⁵ MacCulloch, *Proofs and Illustrations of the Attributes of God*, 1.418–19.

³⁶ Paley, *Natural Theology in The Works of William Paley*, 474.

Cyclicality

For contemporary environmentalists, recycling is mainly practical: a matter of avoiding reliance on nonrenewable resources, ensuring renewable ones are renewed, and diminishing the massive waste stream. Only occasionally is it sacramental or symbolic. To the natural theologians, living in a presterile world, evidences of nature's "mutabilite" were omnipresent existential truths. The most profound recycling was of one's physical body, which provided occasion for peculiarly Christian reflection on the gulf between spirit and decomposable flesh. Often natural theologians drew on Biblical treatments—"all flesh is grass" (Isa. 40:6)—expanding these into artistic and literary tropes. As it is in *Hamlet*, that reflection was not merely ambivalent, but multivalent.³⁷

Natural theologians often gazed admiringly at matter's motility. Sturm writes of the fall of leaves: "Nothing perishes, nothing is useless in the world, consequently the leaves which fall from trees and plants are of some use; they grow putrid, and become manure for the earth; snow and rain separate the saline particles from them, and convey them to the roots of trees."³⁸ Predation itself was the most remarkable mode of recycling, he notes, reminding readers of their place in the ascending and descending food chain:

The earth supplies the plant with its nutriment, the plant the insect, the insect the bird, the bird the wild beasts; and in their turn the wild beasts become food for the vulture, the vulture to the insect, the insect nourishes the plant, and the plant the earth. Man himself ... often in turn becomes their prey. Such is the circle in which every created thing revolves.³⁹

Paley, writing in the midst of the chemical revolution, celebrates the cycling of gases between animals and plants, with each supplying the other's needs. Although he will not yet name the elemental cycles, he is recognizing vegetation as a carbon sink, though the context is respirability and not greenhouse gases. Many processes vitiated air; were there "no restoring causes," it would eventually "be deprived of its necessary degree of purity." Predecessors, including Sturm, had highlighted physical purification via winds. Paley here was enlisting the latest research, which had "opened to us a beautiful and a wonderful economy ... [the] constant circulation of benefits maintained between the two great provinces of organized nature. The plant supplies, what the animal has poisoned; in return, the contaminated air is more than ordinarily nutritious to the plant."⁴⁰

MacCulloch amplifies Sturm's representation of predation as the great connector. He confronted the most general issue of theodicy: justifying death. On the fact of it, that "sentient beings furnished with the means of enjoyment" should die, often suffering in the process, was "an evil thing." He rejected both theological and material

³⁷ Christopher Hamlin, "Good and Intimate Filth," in *Filth: Dirt, Disgust, and Modern Life*, (eds.) William Cohen and Ryan Johnson (Minneapolis: University of Minnesota Press, 2004), 3–29.

³⁸ Sturm, *Sturm's Reflections on the Works of God*, 370.

³⁹ *Ibid.*, 420.

⁴⁰ Paley, *Natural Theology in The Works of William Paley*, 455.

reasons for the “termination of organizations.” This was no “accident” of vital chemistry, as Archbishop King (anticipating discoveries of shortening telomeres), had held but essential to what he saw as the main end of the Creation, consumption. “For this alone ... does all else exist; every thing that is, is but a preparation ... Materials, elements, chemistry, light, heat, mechanism, multiplicity of organic forms, the earth itself, the very sun, are, that animals may eat.” In brief, we did not eat to live, but lived to eat, and died to be eaten. The themes are from the 104th psalm and the closing chapters of Job—Jehovah’s lecture on the perfect “commissariat” of “the great army of animals.”⁴¹

Destabilizing humans

Thus far I have highlighted examples of various forms of biogeochemical dynamism. But do these authors worry that humans may seriously, even irreparably, disrupt these complex interactions? As with their concerns about pest eradication efforts, and more broadly in their anxiety about population stability, they are aware of potential problems. The former will yield to wiser agriculture, while the latter must rely on natural checks—MacCulloch, however, posits that the elevation of coral islands may be God’s way of creating new land for a growing human population.⁴² The general tone, however, is of stability and sustainability. They write to reassure: the world was well arranged and properly functioning. In the seventeenth century, natural theology (at least in England) had been an antidote to the antinomians’ efforts to claim millenarian narratives—whether of a wearing out of the world or of its progressive evolution toward a glorious end. Their emphasis on stability is part of what diverts the natural theologians from evolution: for Paley, the checks and balances to populations were precisely what prevented extinction.

MacCulloch, however, both geologist and social critic, did see irreversible environmental change (and a record of extinctions) as features of the Earth’s history. He writes of deforestation:

Man commences by occupying the lower and more convenient lands, and, blinded by his ignorance or his avarice, destroys what he scarcely knows how to renew, while it is indispensable to his existence. The utter and merciless destruction of the forests is his first movement; and had it not been for the mountain, sometimes also for the marsh, defying his endeavours, or refusing him an adequate return of wealth for his labours, not only would many parts of the world have been utterly denuded of wood, but we might also imagine a time when his increasing numbers would almost exterminate the forests of the earth. Has not the mountain, the parent of the water, the source of the soil, been also appointed as the nurse and the guardian of wood?⁴³

⁴¹ MacCulloch, *Proofs and Illustrations of the Attributes of God*, 1.405–8, 3.45.

⁴² *Ibid.*, 1.499.

⁴³ *Ibid.*, 1.163.

MacCulloch understood this as a tragic outcome of human free will: the God who “permits man to range widely through the great field of wickedness, folly, and self-destruction” also decreed “Thus far shall thou go and no further, lest he destroy the very system on which his existence and destinies depend, ... [and] defeat the purposes of his Creator.”⁴⁴

Conclusion

I have suggested that common home matters do have deep cultural roots in natural theology, a body of reflection about how to contemplate worldly existence and in doing so seek responsible personhood. I have suggested too that we should look to it in seeking the prehistory of both the environmental sciences and environmental consciousness: that is where these things lived before they gained their modern identities.

But do, or could, those roots yield contemporary fruits?

As well as giving some sense of the substance of pre-Darwinian natural theology, I have hoped to convey something of its several flavors, of the relation of author to reader. This varies. MacCulloch is analytical, but Paley and particularly Sturm are conversational and sometimes reflective: they want to talk about what they think may be bothering us.

Let me contrast their approach with what I take to be the prevailing contemporary disciplinary approach to addressing “common home” issues. In the latter, the domain of “nature” unproblematically belongs to the natural sciences; one goes to the science faculty to study it. But within the fragmented university, knowing is separate from valuing and from acting. When it comes to killing or destroying things, one might need to cross the campus to find some appropriate domain of applied ethics. But even were it not the case that ethicists differ, one’s actual acting in the world would be a matter of one’s freely chosen identity, or whatever it is that occupies the interstices not covered by scientist or ethicist.

Compare that with the approach of these natural theologians. Sturm, Paley, and MacCulloch are hardly uninterested or dismissive of science (all, for example, considered the new knowledge of plant–animal gas exchanges). At issue is not acceptance but interpretation. The natural theologians are disrespectful of any narrowly disciplinary limits of knowledge, however. The foundation of their interpretation is integrative—not merely of the scientific domains integrated in ecology (or better, a comprehensive biogeochemical science)—but the integration of these with other forms of human sciences, which include theological inquiry. They inherit that premise from the monism of monotheism: an assumption that all comes from and makes sense in terms of one God warrants the expectation that everything does relate to everything else. They share this presumption with more naturalistic forms of monism, including those underlying comprehensive environmental sciences. The stakes differ, however. For the scientist, explanation will be primary; for the natural theologian, defending God’s competence was key. Their antithesis was an “all is random and meaningless” view that led, they thought, to amorality and apathy.

⁴⁴ Ibid.

That integration privileges the standpoint of the inquiring, world-altering, and meaning-seeking human whose business will be creating some “common home,” however well or poorly the knowledge-transmitting institutions of the day may support that quest. That person’s immediate concern is not so much “what is,” but “what shall I do on the basis of what I think about what is.” It will involve a squaring of science and of ethics with experience, situation, and the manifold aspects of identity and obligation.⁴⁵

That cosmological project of juggling self, good, and the world until they fall into line is not in fact so radical or foreign an undertaking. In many ways it mirrors the actual concerns of environmental sciences and environmental movements. Thus, however often professional ecologists defend their discipline as just another basic science, normative issues of how the world should be pervade its history and usually underwrite its labors. Notions of better or worse states of nature are hard to escape; terms like “biodiversity” function equally as descriptors and commandments.⁴⁶ What differs from the heyday of the natural theologians is the disintegration of disciplinization. The contest for authority among disciplines has left little authority to the persons who will be the authors of the “common home.”

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⁴⁵ For these themes with regard to Paley, see Niall O’Flaherty, “The Rhetorical Strategy of William Paley’s Natural Theology (1802): Part 2, William Paley’s Natural Theology and the Challenge of Atheism,” *Studies in History and Philosophy of Science Part A* 41.2 (2010): 128–37.

⁴⁶ On biographical and sociological links, see Stoll, “Creating Ecology,” in *Faith in Nature: Environmentalism as Religious Quest*, (ed.) Thomas Dunlap (Seattle: University of Washington Press, 2005).

Thoreau's Woodchopper, Wordsworth's Leech-gatherer, and the Representation of "Humble and Rustic Life"

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Humility is still a human virtue.

— Henry David Thoreau¹

Romanticism glorified—we now say “romanticized”—the lives of so-called “common men” close to nature. Wordsworth wrote in the “Preface” to *Lyrical Ballads* that the subjects of his poems were “incidents and situations from common life” and that he wanted to “describe them ... as far as was possible in a selection of language really used by men.” In this, he sought to give voice to common people, in the belief that those in “humble and rustic life” express the virtue that exists in plain language, simple feeling, rural occupations, and natural forms.² But there is a paradox at the center of representing the virtues of simplicity in this way. In identifying their subjects as simple and virtuous, pastoral authors implicitly contrast them with their more complex, vicious counterparts.³ Descriptions of country people as “simple” and “plain” are meant

¹ Henry David Thoreau, *The Writings of Henry David Thoreau: Journal, Volume 2: 1842–1848*, (ed.) Robert Sattelmeyer (Princeton: Princeton University Press, 1984), 350.

² I quote from the edition Thoreau is likely to have read: William Wordsworth, *The Complete Poetical Works of William Wordsworth: Together with a Description of the Country of the Lakes in the North of England, Now First Published with His Works*, (ed.) Henry Reed (Philadelphia: James Kay, Jun. & Brother, 1837), 497.

Humble and rustic life was generally chosen, because, in that condition, the essential passions of the heart find a better soil in which they can attain their maturity, are less under restraint, and speak a plainer and more emphatic language; because in that condition of life our elementary feelings coexist in a state of greater simplicity, and, consequently, may be more accurately contemplated, and more forcibly communicated; because the manners of rural life germinate from those elementary feelings, and, from the necessary character of rural occupations, are more easily comprehended, and are more durable; and, lastly, because in that condition the passions of men are incorporated with the beautiful and permanent forms of nature.

³ One important exposition of this dynamic between “country” and “city” in pastoral literature is Raymond Williams, *The Country and the City* (New York: Oxford University Press, 1975). A classic work on the power of the pastoral ideal in the American context is Leo Marx, *Machine in the Garden: Technology and the Pastoral Ideal in America* (New York: Oxford University Press, 1964).

as praise in pastoral literature and often intended to undermine the common valuation of urban over rural culture.⁴ However, the romantic trope risks affirming a mere caricature of the people it describes with admiration, and thereby undermining the author's own aim of truly representing those people and their honest virtues. Pastoral authors may be particularly tempted, out of a perverted piety toward country people or "common men," to subsume the subjects they describe into a monolithic type, to turn everyone they meet—in the fields, on the moor, or in the woods—into a sage.

I investigate the danger of caricature in pastoral literature by comparing two literary portraits of men living "humble and rustic" lives: the "Leech-gatherer" in Wordsworth's poem "Resolution and Independence" and the woodchopper in Thoreau's *Walden*. The subjects of these portraits share a lot in common. Despite tenuous economic circumstances—in particular dependence on a feature of the natural world (leeches and wood) whose abundance is dwindling—the subjects of these writings maintain an uncommon capacity for delight. In this, they offer much-needed balm to the poet and in some ways function as his teachers. Both Wordsworth and Thoreau struggled with feelings of what they called "dejection," and both found that their subjects were surprisingly good at avoiding it. In this sense, the woodchopper and the Leech-gatherer are rendered by these authors as sages.

But despite their commonalities, I argue that Thoreau's representation of the woodchopper offers a critical response to Wordsworth's representation of the Leech-gatherer. Whereas Wordsworth's Leech-gatherer serves as an easy moral to a story about poetic dejection, Thoreau signals complicated aspects of the woodchopper's character. Whereas Wordsworth's Leech-gatherer speaks only once in the poem, Thoreau represents the speech of the woodchopper many times. Whereas Wordsworth's judgments of the Leech-gatherer's character remain implicit in the poem, Thoreau makes his judgments of the woodchopper explicit and therefore subject to our criticism, and to his. And, crucially, whereas Wordsworth's representation of the Leech-gatherer never doubts itself, Thoreau insists on his own unknowing with respect to the woodchopper. I suggest that though Thoreau may look condescending (for instance in his portrayal of the woodchopper as intellectually and spiritually deficient), these features are a part of his critical response to Wordsworth's caricatured praise of the Leech-gatherer. In the context of the tradition to which Thoreau is heir, he offers a more nuanced representation of "humble and rustic life."

This comparison shows that while the pastoral tradition risks caricaturing the subjects it describes, there is controversy within the tradition over how to represent

⁴ In general, I use "romanticism" to indicate the particularities of the late eighteenth- and nineteenth-century literary movement in England. I use "pastoral" as a broader category to include both romantic authors and other literature (including the heirs of romanticism in the United States) that takes nature and the people who live and work there as its subject. This broad use of the term "pastoral" is controversial in literary studies, where at least one important critic has written that such use is an "irritant": see Paul Alpers, *What Is Pastoral?* (Chicago: University of Chicago Press, 1997), ix. Furthermore, in the North American ecological context, there were no pastoral shepherds in either Native North America or early English colonies. Gordon Sayre has argued that in North America the genre is therefore inevitably caught up in the colonization of Native American landscapes and people: see Gordon Sayre, "The Oxymoron of American Pastoralism," *Arizona Quarterly* 69.4 (2013): 1–23.

the rural other. In conclusion, I suggest that this nineteenth-century controversy offers insight for the present day. The stories of people who live close to nature can enrich scholarship on religion and ecology, but attempts to give voice to other people risk flattening them in the process. Such a risk should not mean we give up on telling their stories, however. Thoreau offers a compelling example: rather than presenting a tidy fantasy of rustic virtue, his description of the woodchopper aims to show us a whole man. Like him, we will not always get representation right. The controversy in which he was participating will continue. But we should nonetheless tell the stories of those who rely on the land, while remaining ever alert for ways in which our representations can do more justice.

Wordsworth's Leech-gatherer

In "Resolution and Independence," Wordsworth struggled with and found a balm for the problem of poetic dejection in a now famous figure, the Leech-gatherer.⁵ The poem begins with the speaker alone on a walk, in high spirits, "happy as a Boy" (18). But his mood soon collapses:

As high as we have mounted in delight
 In our dejection do we sink as low,
 To me that morning did it happen so;
 And fears, and fancies, thick upon me came;
 Dim sadness, and blind thought I knew not nor could name. (24–8)

This unnamable dejection is a particular burden of poets, according to the speaker of the poem, who suggests that the "up and down" of his "fancy" on that day was an epitome of the life of the poet as a whole (53). "We Poets in our youth begin in gladness; / But thereof comes in the end despondency and madness" (48–9). Yet, on the day depicted in the poem, the day of the speaker's rollercoaster of "delight" and "dejection," there appeared to him "a Man from some far region sent; / To give me human strength, and strong admonishment" (118–19).

Wordsworth describes the "Old Man," "[c]lose by a Pond," his body "bent double" in "pain" or "sickness," "[p]ropped upon a long grey Staff of shaven wood," "[m]otionless as a Cloud."⁶ Then, as the Old Man looks fixedly "[u]pon the muddy water" of the pond "[a]s if he had been reading in a book" and stirs it with his staff (85–8), the speaker initiates a conversation: "'This morning gives us promise of a glorious day'" (91). The Old Man's response is not quoted but rather summarized by the speaker. "A gentle answer did the Old Man make, / in courteous speech which forth he slowly drew" (92–3). Thus begins a pattern with which the poet goes on to recount most of the conversation between the speaker and the Old Man: the speaker's words are directly

⁵ Parenthetical citations refer to line numbers in William Wordsworth, "Resolution and Independence," in *Selected Poems*, (ed.) Stephen Gill (London, New York: Penguin Classics, 2005), 137–42.

⁶ Lines 59, 73, 75, 76, 78, 79, 82.

quoted, four times, and the speaker summarizes the responses of the Old Man without quoting his words.⁷

His words came feebly, from a feeble chest,
 Yet each in solemn order followed each,
 With something of a lofty utterance drest;
 Choice word, and measured phrase; above the reach
 Of ordinary men; a stately speech! (99–103)

As the Old Man's "stately speech" goes on, however, the speaker's mind wanders: "His voice to me was like a stream / Scarce heard" (114–15). The dejection of the earlier stanzas, "the fear that kills," returns for a stanza; the mind of the speaker is distracted by his own thoughts until, "not knowing what the Old Man had said," the speaker repeats the question he had already asked the Old Man.

In the penultimate stanza, the speaker says that while the Old Man was talking, repeating his answer the second time, the speaker was "troubled" by thoughts about the Old Man "[w]andering about alone and silently" (138). Then, in the last stanza, the speaker notices (suddenly tuning in to what the man is actually saying) that while he has been troubled to think of the Old Man wandering and alone, in fact the man though "decrepit" was "firm of mind," cheerful even.

And soon he this with other matter blended,
 Cheerfully uttered, with demeanour kind,
 But stately in the main; and, when he ended,
 I could have laughed myself to scorn, to find
 In that decrepit Man so firm a mind.
 "God," said I, "be my help and stay secure;
 I'll think of the Leech-gatherer on the lonely moor." (141–7)

Thus, the poem ends. This last stanza implies (abruptly, to my mind) that thinking "of the Leech-gatherer on the lonely moor" somehow treats the problem of poetic dejection. The Leech-gatherer shows the speaker that firmness of mind is possible in any state—even decrepit and alone on the moor, looking for rare leeches. If this is so, then the poet has reason to think his own up and down from delight to dejection is unnecessary; the example of the Leech-gatherer shows someone who, though in a situation that might understandably cause dejection, nonetheless maintains "so firm a mind." The Leech-gatherer is able to avoid the up and down experienced, and regretted, by the speaker.

As he wrote in the "Preface" to *Lyrical Ballads*, Wordsworth valued "language really used by men," and he took his own poetry to be exceptional in the extent to which it incorporated everyday speech patterns and diction. The "Preface" even worried that

⁷ Elfenbein notes that the poem quotes the Old Man's "lofty utterance" directly in only three lines. Andrew Elfenbein, *Romanticism and the Rise of English* (Stanford: Stanford University Press, 2008), 45–6.

the poems were so different from what readers would expect that some might not call it poetry. "They will look round for poetry, and will be induced to inquire by what species of courtesy these attempts can be permitted to assume that title."⁸ To the extent that Wordsworth included and valued the language of the rustic figures he represented, he took himself to be engaged in a massive literary innovation.

But consider the structure of speaking and listening in "Resolution and Independence," which was composed around the same time as the "Preface." Wordsworth's Old Man is quoted once; the speaker mostly summarizes his speech. Readers might reasonably wonder whether Wordsworth's views on "humble and rustic life," combined with his admiration for the Old Man—his romantic piety—might have tempted him to oversimplify his representation of the Leech-gatherer, to reduce the Old Man from a particular, complicated man to a type: the simple sage who teaches how to overcome poetic dejection. The only names the poem ever gives the man are "Old Man" and "Leech-gatherer." The fact that the poem quotes his words only once, briefly, plus the wandering mind of the speaker during conversation with the Old Man, plus the easy resolution that the image of "the Leech-gatherer on the lonely moor" offers the speaker's "troubles"—all point to a distracted idealization of the Old Man on Wordsworth's part. What is important, in the poem, is the poet; the Old Man is a prop. Such a reduction, though motivated by admiration, would be objectionable because it would erase the human complexity of the Old Man and would subsume him into a type: the Wordsworthian sage.

That suspicion is complicated by three things. First, Wordsworth's representation of the speaker's wandering mind suggests that Wordsworth himself may be playing with the risk of caricature native to the tradition. Because the speaker becomes distracted from the speech of the Old Man twice in quick succession, that distraction reads like a mistake, a sort of hiccup, or a misstep in the movement of the poem. The representation of the inattention of the speaker is purposeful; it may refer to the way dejection can lead to selfishness, and part of the poem's purpose may be to represent the problem of solipsism. This complicates the straightforward view that the inattention of the speaker demonstrates a failure of the author to fairly represent his subject. Perhaps one of the things the poem is *about* is how easy it is for authors to ignore their subjects and turn them into symbols.

Second, what the Old Man says has deep significance in the context of the poem. In response to the speaker's asking, for the second time, "What is it you do?" the Old Man replies, and part of his response is quoted as three key lines of the poem. The choice to include only one direct quotation may stress the importance of what the Old Man says.

He with a smile did then his words repeat;
 And said, that, gathering Leeches, far and wide
 He travelled; stirring thus about his feet
 The waters of the Ponds where they abide.
 "Once I could meet with them on every side;
 But they have dwindled long by slow decay;
 Yet still I persevere, and find them where I may." (127–33)

⁸ Wordsworth, *Complete Poetical Works of William Wordsworth*, 497.

In the context of the poem, the lines Wordsworth quotes refer to at least two things. They refer, first, to the occupation in which the Old Man labors, gathering leeches for sale in medical use. They refer, second, to the subject of the poem—the up and down of dejection and delight in the life of the poet. Wordsworth worried that his own once ecstatic youth had transformed into a disenchanting adulthood: “We Poets in our youth begin in gladness; / But thereof comes in the end despondency and madness” (48–9). Whereas vision and delight used to be, as leeches used to be, findable on every side, now they are scarce. Nonetheless, like the Leech-gatherer, the poet may “persevere, and find them where I may.” This puts the easy moral suggested by the ending of the poem in a different, darker light. The poet’s recovery from dejection does not lead him back to his ecstatic youth but analogizes his situation to what is in fact not an easy occupation. Leech-gatherers, after all, stand in ponds waiting for leeches to suck their blood.

Third, the speaker himself suggests in the last stanza that his expectations about the Old Man had rendered it difficult for him to see the man truly. Thus, “I could have laughed myself to scorn.” The laughter is inspired by the speaker’s realization that he had let his expectations about the Old Man determine what he saw—perhaps the body bent double in pain or sickness—rather than seeing the Old Man as he was: decrepit, yet nonetheless firm of mind. This feature of the poem thematizes the problem with which I am occupied, when romantic idealizations fail to do justice to their subjects. This shows how the literary tradition itself may be read as a struggle with one of its greatest temptations, which is to flatten the subject it admires.

Thoreau’s woodchopper

Like Wordsworth, Thoreau thought there were important lessons to be learned from nature and from people who lived close to nature and worked in rural occupations. For the most part, Thoreau’s project in *Walden* was, in contrast to Wordsworth’s, to create a world in which Thoreau was himself the country worker, rather than—as Wordsworth’s poems usually did—watching and describing those who worked in rural occupations.⁹ Thoreau aimed to become one of those whom Wordsworth might have represented.

This effort to join rural labor may have led Thoreau to a subtler treatment of other inhabitants of the woods. Unlike Wordsworth’s account of the Old Man, in which the man provides a relatively tidy moral for the poet, Thoreau insisted on ambivalence in his portrait of the Canadian woodchopper. I read this portrait as a critical response to Wordsworth’s representation of the Leech-gatherer. Thoreau wrote in his journal in 1859, “There are poets of all kinds and degrees, little known to each other. The Lake School is not the only or the principal one.”¹⁰ Thoreau both admired the achievements

⁹ Robert Weisbuch puts the point succinctly—“Thoreau enacts what Wordsworth contemplates,” in *Atlantic Double-Cross: American Literature and British Influence in the Age of Emerson* (Chicago: University of Chicago Press, 1986), 146.

¹⁰ Henry David Thoreau, *Journal: July 2, 1858–February 28, 1859*, vol. 17 of *The Writings of Henry David Thoreau*, (ed.) Bradford Torrey (Boston: Houghton Mifflin, 1906), 423. The lines that follow the quote are: “They love various things. Some love beauty, and some love rum. Some go to Rome, and some go a-fishing, and are sent to the house of correction once a month. They keep up their fires by means unknown to me. I know not their comings and goings.” “I know not” is an important marker of Thoreau’s insistence on his own unknowing.

of the Lake District poets and ambitiously aimed to supersede them. Wordsworth's fascination with common speech and ordinary life enabled Thoreau to work with even more complex images, images that aimed at an even more faithful representation of "humble and rustic life."

Whereas the caricature of Thoreau has him insistently avoiding social contact, especially in the years recounted in *Walden*, he recorded interactions with many visitors while living in the woods. The woodchopper was a new friend Thoreau made, just a little more than a week after moving to the woods. They read Homer together, with Thoreau translating.¹¹

The portrait of the woodchopper occupies the center of "Visitors," the sixth chapter of *Walden*. It begins by describing a man "who should come to my lodge this morning," "a Canadian, a woodchopper and post-maker, who can hole fifty posts in a day, who made his last supper on a woodchuck which his dog caught."¹² Beginning with this allusion to the Last Supper, which analogizes the woodchopper to Christ, but in a very strange way, Thoreau's description of the woodchopper proceeds through another eight paragraphs. From the first sentence until its conclusion, the portrait of the Canadian woodchopper takes up nearly half of the chapter in which it appears. It is the longest description of any single person besides Thoreau himself in *Walden*.

The title of the chapter in which the woodchopper appears enacts the switch in subject position that Thoreau made with respect to Wordsworth. Thoreau received visitors in the woods, rather than visiting those who lived there. In "Resolution and Independence," Wordsworth comes upon the man on the moor and then returns home with a lesson in delight. In "Visitors," Thoreau is the one living outside of town, receiving visitors who come and go. Thoreau had written, in the paragraph before the woodchopper appears, "I had more visitors while I lived in the woods than at any other period of my life; I mean that I had some. I met several there under more favorable circumstances than I could any where else. But fewer came to see me upon trivial business."¹³ In the woods, Thoreau had more visitors than ever. The phrase, "I mean that I had some," suggests that by "more visitors," Thoreau means not necessarily that he had more visitors in number, but instead that he had more true visitors in some implicit sense. Perhaps he had more visitors who came for a real visit, rather than to transact "trivial business." His circumstances in the woods were more conducive to true visiting. Ironically perhaps, these conditions—a mile from town—"no gate—no front-yard,—and no path to the civilized world!"—make social life better.¹⁴

¹¹ Thoreau leaves the woodchopper purposefully unnamed in *Walden*, writing, "He had so suitable and poetic a name that I am sorry I cannot print it here." Readers of the journal can recognize most of the material as having evolved from descriptions of Thoreau's relationship with Alek Therien. But many recent interpreters are not very careful about maintaining the distance between the woodchopper of *Walden* and Alek Therien of Walden Pond. I purposefully maintain this distance out of respect for the mythological form Thoreau chose in the writing of *Walden*. Two examples of interpreters who call the woodchopper of *Walden* "Alek Therien" are Philip Cafaro, *Thoreau's Living Ethics: Walden and the Pursuit of Virtue* (Athens, GA: University of Georgia Press, 2004) and Alan Hodder, *Thoreau's Ecstatic Witness* (New Haven: Yale University Press, 2001).

¹² Henry David Thoreau, *Walden, Civil Disobedience, and Other Writings*, (ed.) William Rossi, 3rd edn. (New York: Norton, 2008), 100.

¹³ *Ibid.*

¹⁴ *Ibid.*, 90.

Thoreau describes the woodchopper as having extraordinary skills. He once knew how to read the Greek of the New Testament, and he speaks both English and “Canadian French.” He is also an accomplished laborer—he “can hole fifty posts in a day”—and he is artful when he chops wood, for he “indulged in some flourishes and ornaments in his art.” He also made the stumps he left behind level to the ground so that they would not impede sleds. He lives well in the woods, on woodchuck, pigeon, rabbits, and partridges. These are skills Thoreau admired. On top of all these skills, despite them, the woodchopper was “simply and naturally humble.”¹⁵

The woodchopper’s humility may be related to his position as a visitor. The woodchopper’s appearance in the chapter on “Visitors” suggests his arrival is a visitation. The visit called by Christians “The Visitation” also recalls simple humility. In Lk. 1:39–56, Mary goes to visit Elizabeth. The speeches made in this visit have become two prominent Christian prayers. Elizabeth’s greeting is quoted in the Hail Mary. Mary’s response to Elizabeth has come down as the Magnificat, recited regularly in the daily patterns of monastic prayer: “And Mary said, My soul doth magnify the Lord ... He hath put down the mighty from their seats, and exalted them of low degree.” In this part of the Magnificat, Mary—symbol of humility in the Christian world—echoes one of the themes of the Hebrew prophets in which present hierarchies are turned on their heads. The high are made low, and the lowly are exalted.

Thoreau takes up this prophetic theme in which the high are made low and the low are made high in “Visitors” more than once. “Half-witted men from the almshouse and elsewhere came to see me ... I found some of them to be wiser than the so called overseers of the poor and selectmen of the town, and thought it was time that the tables were turned.”¹⁶ There was one “simple-minded pauper” in particular who Thoreau thought achieved exaltation through humility. In their conversation, the pauper tells Thoreau that he is “deficient in intellect.” Thoreau has those words in quotation marks, spoken by the pauper. The pauper impresses Thoreau in his capacity for truth telling: “It was so simple and sincere and so true all that he said. And, true enough, in proportion as he appeared to humble himself he was exalted.”¹⁷ The humility of the characters in “Visitors” contributes to their capacity for truth.

Perhaps because of his humility, then, the woodchopper is a fine philosopher and an excellent interpreter of contemporary politics. Thoreau describes conversations he and the woodchopper had about “the various reforms of the day.”¹⁸ These are topics that recur throughout *Walden*, as Thoreau’s concerns about contemporary economy are combined with his dislike for the way many reformers approached the subject. The woodchopper was a common-sense reformer in the same mode as Thoreau.

He never failed to look at [the various reforms of the day] in the most simple and practical light. He had never heard of such things before. Could he do without factories? I asked. He had worn the home-made Vermont gray, he said, and that was good. Could he dispense with tea and coffee? Did this country afford any

¹⁵ *Ibid.*, 102.

¹⁶ *Ibid.*, 104.

¹⁷ *Ibid.*, 105.

¹⁸ *Ibid.*, 103.

beverage beside water? He had soaked hemlock leaves in water and drank it, and thought that was better than water in warm weather.¹⁹

Thoreau himself was concerned with the conditions of the factories, and in the beginning of *Walden*, suggests that one reason to wear simple clothes and avoid buying new ones is because the conditions of the workers in the factories are bad. Similarly, it was common among abolitionists to abstain from tea and coffee, since they were associated with slave labor. The woodchopper here provides positive reasons for abstentions Thoreau endorsed: the gray fabric produced in homes in Vermont is *good*—no need for factories. Hemlock in water is *better* than plain—why import other beverages?

This is the shape of reasoning that Thoreau employs in *Walden*: while following many reformist lines, he seeks to reason to them differently than reformers usually did. Centrally, Thoreau insisted there was positive value—true good—in what could look like merely negative renunciation. Thoreau sought not merely to reject the evils other reformers did but also to embrace the goods such renunciation allowed. In this way, the woodchopper reflects Thoreau's own aims—to do philosophy that was attached to the world and the things in it, and especially that emphasized the good philosophy pursued. The woodchopper, Thoreau writes, "could defend many institutions better than any philosopher, because, in describing them as they concerned him, he gave the true reason for their prevalence, and speculation had not suggested to him any other."²⁰ Because of his humility and simplicity, the woodchopper avoids the temptation to speculation. This means he has virtues some so-called philosophers lack, virtues that enable his capacity for truth.

The woodchopper is also good at being happy, which made Thoreau admire him. Thoreau had announced his purpose for *Walden* even before its first chapter began in an epigraph that he authored: "I do not propose to write an ode to dejection, but to brag as lustily as chanticleer in the morning, standing on his roost, if only to wake my neighbors up." In the literary history to which Thoreau was heir, the line was purposefully contrary. It set itself against Coleridge's famous "Dejection: An Ode," which had been—in turn—a response to Wordsworth's "Resolution and Independence." Both poems depicted poetic dejection, a feeling of despair that made the enjoyment of life and nature extremely difficult. They saw it as deeply related to the life of poetry and, in many cases, a problem brought on by distance in time from ecstatic experience. Thoreau's purpose as set out in the epigraph, to brag lustily rather than hymn dejection, is partly inspired by what he—like Wordsworth and Coleridge—took to be the difficulty of the effort to brag lustily, both for Thoreau himself and for the audience he imagines for the book. While interpreters have often taken Thoreau to be self-obsessed, the epigraph suggests that the bragging did not come naturally to Thoreau but was an effort to keep dejection at bay.

The woodchopper is particularly inspiring to Thoreau in the ease and purity with which he seemed to achieve happiness. As the Leech-gatherer had helped

¹⁹ Ibid.

²⁰ Ibid.

Wordsworth overcome dejection, the woodchopper helps Thoreau: he provides an example of one who lives, for the most part, happily. “He interested me because he was so quiet and solitary and so happy withal; a well of good humor and contentment which overflowed at his eyes. His mirth was without alloy.”²¹ To the extent that the woodchopper offers a window into another mode of life, one less burdened by the imprisonment of self-regarding opinion and its accompanying dejection, the woodchopper plays a role for Thoreau somewhat similar to Wordsworth’s Leech-gatherer. But unlike Wordsworth’s Old Man—and many of Wordsworth’s other sages—Thoreau’s description of the woodchopper is multivalent. Thoreau does not see only an inspiring image in the woodchopper; he is admirable, but he is no sage. In fact, Thoreau’s portrait of him is deeply ambivalent and in this sense human. Thoreau described him in ways that seem to reflect Thoreau’s admiration for him. But Thoreau sees flaws in him, too.

Thoreau writes that while the woodchopper was well developed as an animal man, “the intellectual and what is called spiritual man in him were slumbering as an infant.”²² He was educated “in that innocent and ineffectual way in which the Catholic priests teach the aborigines,” educated to remain as a child—to revere “wiser men”: writers and preachers. “He was so genuine and unsophisticated that no introduction would serve to introduce him, more than if you introduced a woodchuck to your neighbor.”²³ Here, Thoreau’s insistence on the woodchopper’s animal nature shades into ambivalence and could even be read as denigration. True, Thoreau admired children and animals, the two images for the woodchopper most often used in this paragraph. (And he also introduced his neighbors to woodchucks.) But for Thoreau, true philosophy and poetry require engagement with spiritual and intellectual life. “Yet I never, by any manœuvring, could get him to take the spiritual view of things; the highest that he appeared to conceive of was a simple expediency, such as you might expect an animal to appreciate.”²⁴ The woodchopper is not “spiritual.”

While these features of the portrait of the woodchopper might seem to condescend, because they suggest Thoreau is above the woodchopper intellectually and spiritually, I think these features respond to the sense that Wordsworth’s poetry falls short of treating its subjects as whole persons, a sense Thoreau may have had that Wordsworth’s sages represent a condescending idealization of country people. I have been suggesting that certain risks are native to pastoral literature. In his portrait of the woodchopper, Thoreau demonstrates his concern with just these risks, especially the risk that this form of literature may flatten the very people it admires. Thoreau’s mixed descriptions of the woodchopper aim to show him honestly, to avoid papering over his life for the sake of a tidy moral.

²¹ *Ibid.*, 101.

²² *Ibid.*, 102.

²³ *Ibid.*

²⁴ *Ibid.*, 104. And yet, look at the key word “maneuvering.” The term is ambivalent in the larger context of Thoreau’s writings. Maneuvering suggests manipulation, and Emerson had been disdainful of “manipular attempts to realize the world of thought” in “Experience.” Ralph Waldo Emerson, *Ralph Waldo Emerson: Essays & Poems*, (ed.) Joel Porte, Harold Bloom, and Paul Kane (New York: Library of America, 1996), 492. Thoreau’s description of his attempts to maneuver the woodchopper should make us wonder whether such maneuvering is itself unspiritual.

I have described what Thoreau saw as the woodchopper's virtues and his shortcomings, but the ambivalence in the portrait of the woodchopper exists not only at the level of his individual character traits. The ambivalence Thoreau tries to evoke runs also into the terms he uses to describe the woodchopper. Many of the woodchopper's traits are neither virtues nor vices. Most dramatically, Thoreau insists on his own unknowing about the woodchopper's character.

With respect to Thoreau's terminological ambivalence, the last sentence of the paragraph before the introduction of the woodchopper includes a key term of ambivalence for Thoreau: *cultivation*.

I had more visitors while I lived in the woods than at any other period of my life; I mean that I had some. I met several there under more favorable circumstances than I could anywhere else. But fewer came to see me upon trivial business. In this respect, my company was winnowed by my mere distance from town. I had withdrawn so far within the great ocean of solitude, into which the rivers of society empty, that for the most part, so far as my needs were concerned, only the finest sediment was deposited around me. Beside, there were wafted to me evidences of unexplored and uncultivated continents on the other side.²⁵

One of the benefits Thoreau found in withdrawing into "the great ocean of solitude" was that there he found evidence of uncultivated continents on the other side. But for Thoreau, cultivation—like civilization—is a polyvalent term.

Cultivation is always a double entendre; it refers both to what humans do to soil and what they do to their own selves. This was a double entendre that Thoreau likely adopted from agricultural reform movements of the period.²⁶ This double meaning is at play throughout three different moods in which Thoreau uses "cultivation" and its related terms.

First, "cultivation" sometimes expresses the ancient sense in which the nurturing required for healthy agriculture is a metaphor for that required for virtue. We cultivate ourselves as we do the soil to make ourselves better, our souls more conducive to good growth. The end of *Walden* recommends: "Cultivate poverty like a garden herb, like sage. Do not trouble yourself much to get new things, whether clothes or friends. Turn the old; return to them." In this, the cultivation of herbs is a metaphor for the cultivation of poverty; cultivating poverty by not getting new things will yield sage, as cultivating a kitchen herb garden also does.

Second, in contrast to the first mood in which cultivation yields good, Thoreau is also concerned that what we sometimes call cultivation and civilization is actually working against our better natures. Of the native "ground-nut," "the potato of the aborigines, a sort of fabulous fruit," Thoreau wrote: "Cultivation has well-nigh exterminated it."²⁷

²⁵ Ibid., 100.

²⁶ *The Cultivator*, a widely circulated agricultural periodical published out of Albany, NY, was an outlet for Jesse Buel's ideas about agricultural reform. Publishers put out compilations in collected volumes. One such compilation published in 1842 stated on the title page that it was "designed to improve the soil and the mind, and to elevate the character and standing of the cultivators of the American soil."

²⁷ Thoreau, *Walden, Civil Disobedience*, 161.

What is called cultivation can work against native virtues. In this sense, Thoreau sometimes uses cultivation pejoratively, as that which people aim at while they are mistaken about what true goods are. Cultivation in this sense undermines another of Thoreau's central values: wildness.

Third, Thoreau writes, we are too inclined to forget that the cultivated and the uncultivated are not categorically different from one another. Both cultivated and wild belong to the same world and in this sense have more in common than we often notice. "We are wont to forget that the sun looks on our cultivated fields and on the prairies and forests without distinction. They all reflect and absorb his rays alike."²⁸ This third sense seeks to reconcile the first two; Thoreau aimed to get the best out of both cultivation and wildness, while remembering that the distinction between them was never ultimate. Thoreau's introduction of the woodchopper as "evidence of" "uncultivated continents" therefore further complicates the portrait because what the reader should take as the meaning of "uncultivated" is not transparent.

In addition to the use of terminological ambivalence, for example, the use of the term "uncultivated" in the polyvalent sense I have described, Thoreau makes the woodchopper's portrait even more complex as it goes along, by explicitly denying the reader a final explanation of the woodchopper's meaning. The portrait ends by invoking the image of muddy water as a metaphor for men "in the lowest grades of life." The image echoes the mud in which Wordsworth came upon the Leech-gatherer, but gives the metaphor a new meaning, not as the difficult place the poet searches for delight but as the elusive aspect of human character: "[The woodchopper] suggested that there might be men of genius in the lowest grades of life, however permanently humble and illiterate, who take their own view always, or do not pretend to see at all; who are as bottomless even as Walden Pond was thought to be, though they may be dark and muddy."²⁹ Once again, this image partakes in the positional imagery of the prophetic theme in the chapter by suggesting that those in the "lowest grades of life" may be "men of genius." In addition, those who are "dark and muddy" might be thought to be that because of their social standing or any number of other reasons, but the image of a bottomless muddy pond also suggests that knowledge about the character of "men" is elusive; we cannot see their bottoms. This, in turn, may be further effort on Thoreau's part to avoid reducing the woodchopper to a type.

The woodchopper is not any one thing, not even any one contrast. He is a true philosopher, but he is not spiritual. He lives wild, but he re-originates many of the institutions of society. He is a person with contradictions, neither idealized nor reviled. In the passage I take to be a key to the portrait, Thoreau suggests that, given the woodchopper's complexity, Thoreau did not know what to make of him. In this, Thoreau exhibits the humility he admired in the woodchopper.

To a stranger he appeared to know nothing of things in general; yet I sometimes saw in him a man whom I had not seen before, and I did not know whether he was

²⁸ *Ibid.*, 114. This is likely an allusion to Matthew 5:45: "He maketh his sun to rise on the evil and on the good, and sendeth rain on the just and on the unjust."

²⁹ *Ibid.*, 104.

as wise as Shakspeare or as simply ignorant as a child, whether to suspect him of a fine poetic consciousness or of stupidity.³⁰

The line, "I did not know," is the key to Thoreau's ambivalent portrait. He had written in his journal in April 1852, after reading about a painter who depicted all four sides of a figure in one painting by surrounding it with reflections, "So I would fain represent some truths as roundly and solidly ... so that you may see round them."³¹ Thoreau's habit was to aim in his writing to show all the parts, not to resolve them into a single image.³²

Conclusion

One important part of contemporary scholarship on religion and ecology brings the stories of nature and people who live close to it to the halls of power. I myself have undertaken ethnographic work that examined ecological harms faced by rural people; I admire all who do such work. But one problem with this project, insofar as it consists in giving voice to others, is that we may flatten those others and their voices, precisely in our effort to speak for them and of their world. Troublingly, and as the romantics show, this may be especially true in our representations of others we most admire. When our representations flatten that which they describe it constitutes a double erasure. To take one example, the United States systematically stole land from and perpetrated mass murder of Native American communities. And yet now, all too often the complex histories of the native societies of the Americas are flattened in naive appeals to their more ecological ways of living. First, there was colonization and annihilation. Now there is also erasure through tidy piety.

In this context, the tradition of struggle with this problem that I have uncovered in these two examples from Wordsworth and Thoreau can inform our thinking about how to carry on representing others in spite of the dangers associated with the project. In my view, Thoreau does better than Wordsworth had in representing "humble and rustic life." First, he makes his judgments about the woodchopper explicit rather than leaving them implicit. This makes them subject to our criticism (and his own) in a way Wordsworth's implicit assumptions about the Leech-gatherer are not. Second, though Thoreau articulates his judgments and offers justifications for them, in many cases, the very terms used in his descriptions of the woodchopper express ambivalence. Third, Thoreau explicitly acknowledges a final ambivalence in his judgments. While Romantic authors often look like they are paternalistically speaking for their subjects, it may make more sense of the tradition as a whole to see them in an ongoing argument about how, when, and what it means to represent a relation to another.

³⁰ Thoreau, *Walden, Civil Disobedience*, 103. Spellings are original.

³¹ Quoted in William Howarth, *The Book of Concord: Thoreau's Life as a Writer* (New York: Viking Press, 1982), 76.

³² Some interpreters argue for this reason that Thoreau's journal is his masterwork and the form of literary production that he preferred. In a journal, thoughts keep moving, changing. In a published work, they are fixed. Thoreau always had an ambivalent relationship to publication.

My sense is that the problems associated with the representation of “humble and rustic life” are not avoidable, though we must try to minimize them; they are part of what it means to be us. We are the kind of beings who love, and whose love will sometimes make us blind, even—perhaps especially—to the things we love. Our awareness of these temptations, our willingness to see those who came before us as also subject to these temptations, to see the ways they acknowledged and fought and failed to overcome but nonetheless did good in the face of these temptations, will enable our own pursuits to do justice for all.

Though as writers we always risk getting it wrong—doing our subjects injustice in the stories we tell about them—we must continue to write. To let this problem silence us would be a dereliction of our obligation to advocate as we can on behalf of those who face the most dire outcomes of industrialization’s overreach. We just have to do the best we can.

You will recall that Thoreau wrote of the woodchopper, “He was so genuine and unsophisticated that no introduction would serve to introduce him, more than if you introduced a woodchuck to your neighbor.” Then he went on, “He had got to find him out as you did. He would not play any part.”³³ The woodchopper, Thoreau meant, would not be reduced to a player in a drama. He would not be the moral of a romantic story. “He would not play any part.” To bring our subjects to life, to let them live rather than play a part, is what our writing about a suffering world can do. Writing all of the complexities may be impossible, I suppose we will always fall short, but getting life onto the page can be our aim. The tradition of pastoral literature gives us most when it does this, when it shows us the living, growing, dying, loving, suffering world.

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³³ Thoreau, *Walden, Civil Disobedience*, 102.

How Ecology Can Save the Life of Theology: A Philosophical Contribution to the Engagement of Ecology and Theology

David G. Kirchhoffer

In 1982, philosopher Stephen Toulmin published an important article entitled “How Medicine Saved the Life of Ethics.”¹ In it, Toulmin argued that, in the first half of the twentieth century, moral philosophy had become bogged down in metaethical questions about the nature of morality and consequently was unable to make any meaningful contribution to the ethical debates taking place in the world. These debates were characterized by moral dogmatists on one side (often operating from religious perspectives) and relativists and subjectivists on the other (influenced by the developments in psychology and anthropology of the time); as the former shouted louder, the latter just shrugged their shoulders and walked away. When either side turned to academic moral philosophy for answers, it got only analytical classifications about morality rather than any real normative conclusions. Toulmin claimed that medicine and the applied bioethical questions that arose after the Second World War saved moral philosophy from its isolation by forcing moral philosophy to deal with concrete, practical realities.

In this chapter, I apply an analysis similar to Toulmin’s to the contemporary relationship between theology and ecology. Whereas Toulmin argues that moral philosophy in the university had become stuck in metaethics, it would seem that theology in many universities, in a variety of contexts, has become increasingly framed as religious studies, characterized by speculative philosophy of religion on the one hand, and sociology and history of religion and religious texts on the other.² Like

¹ Stephen Toulmin, “How Medicine Saved the Life of Ethics,” *Perspectives in Biology and Medicine* 25.4 (1982): 736–50.

² In the 2010 ranking of academic journals produced by the Australian Research Council, the list of the fourteen top-ranked journals in the field of religion and religious studies is illuminating: only three can be described as theology journals, the others dealing with various aspects of church history or biblical studies. See also Linell Cady and Delwin Brown (eds.), *Religious Studies, Theology, and the University: Conflicting Maps, Changing Terrain* (Albany: State University of New York Press, 2002); Gavin D’Costa, *Theology in the Public Square: Church, Academy, and Nation* (Malden, MA: Wiley-Blackwell, 2005); James Cox and Steven Sutcliffe, “Religious Studies in Scotland: A Persistent Tension with Divinity,” *Religion* 36.1 (2006); Gavin D’Costa, “Windows into Faith: Theology and Religious Studies at the University,” in *Communicating Faith*, (ed.) John Sullivan (Washington, DC:

metaethics in Toulmin's analysis, in an effort to appear impartial and rigorous, much academic "theology" seems increasingly unable to make a meaningful theological contribution to the religious debates taking place in the world.

The "real-world" religious debates, like the moral ones in Toulmin's article, are characterized by two poles: clericalist, fundamentalist, or confessional dogmatism on the one hand, and pluralist and relativist positions on the other. The dogmatists (who largely identify with a religion, though some atheists and secularists might also be categorized this way) see their religion as a set of absolute truths and feel that these truths are being ignored or denied in today's societies. The pluralists and relativists (again under the influence of streams in anthropology and psychology, but also of a new awareness of historicity and the limits of certainty typical of much post-modern philosophy) reject such absolutist claims, arguing for tolerance and religious freedom, or the removal of any public role for religion.³ Largely matching Toulmin's steps, the analysis in this chapter reveals four ways in which the attention that theology began to pay to ecology from about the 1960s⁴ could help the discipline of theology make meaningful contributions to these debates.

Toulmin identifies four ways in which moral philosophy has benefitted from its engagement with medicine. First, there was a renewed focus on objective criteria, on needs and harms rather than feelings and wishes. Second, there was a renewed interest in concrete cases rather than universal principles. Third, there was a renewed appreciation for the ethical obligations that arise from the social role that individual actors have as part of a community of practice, rather than trying to frame everything in terms of a theoretical, ideal human individual. Fourth, there was renewed attention to relationships as definitive aspects of circumstances, and hence a move away from a focus on the morality of particular acts, together with a reappropriation of the concept of treating people equitably rather than merely equally. In the sections that follow, each of these four topics is dealt with in turn but now mapped onto the interaction between ecology and theology.

The objectivity of needs and harms

Ecology as a discipline can help to renew theology's focus on objective needs and harms that characterize the interactions among organisms and their environments

Catholic University of America Press, 2011); Clemens Cavallin, "After the State Church: A Reflection on the Relation between Theology and Religious Studies in Contemporary Sweden," *Journal for the Study of Religions and Ideologies* 10.29 (2011): 43–63.

³ Illustrative of this tension is Cardinal Joseph Ratzinger's 2005 speech on the "dictatorship of relativism," "Pro Eligendo Romano Pontifice," Homily of his eminence Card. Joseph Ratzinger, Dean of the College of Cardinals, Vatican Basilica, April 18, 2005. Online: http://www.vatican.va/gpII/documents/homily-pro-eligendo-pontifice_20050418_en.html (accessed January 18, 2012). Also see the reply by Gianni Vattimo, "A 'Dictatorship of Relativism'?" *Common Knowledge* 13.2/3 (2007). Note that Ratzinger as Pope Benedict XVI nonetheless strongly supports religious freedom, although this is to counter relativism and indifferentism rather than accept it.

⁴ While important groundwork was laid in the work of scientist-theologians like Pierre Teilhard de Chardin, the interaction of theology with ecology begins with Joseph Sittler, "A Theology for the Earth," *The Christian Scholar* 37.3 (1954): 367–74. The real turn, especially in Protestant theology, to addressing ecological issues, however, is probably initiated as a response to the critical article by Lynn White, Jr., "The Historical Roots of Our Ecological Crisis," *Science* 155.3767 (1967): 1203–7.

in a generalizable way. This will help to avoid the tendency in theology toward anthropocentric egoism and the creation of God in our own image. Moreover, the focus on the objective realities of how our “home” really works forces theology to dismiss medieval cosmologies and biologies that have led to oppression and other injustices.⁵

Both theology and religious studies, in universities and in the world, are prone to the same problem. Consider an anthropologist of religion studying the religious practices of a newly discovered tribe.⁶ The anthropologist is not interested in whether the religious practices of that tribe could be generalized to include all human beings. Rather, the anthropologist is interested in the internal coherency of the religious practices and beliefs as a way of explaining that tribe’s experience of their world, suffering, social order, and so on. The same can be said for the systematic theologian. The difference is that while the anthropologist might claim to be an objective observer, the theologian is an involved participant within a particular system of religious thought. The task of the systematic theologian is to develop precisely the internal coherency that the anthropologist is interested in. The problem in both cases is that this can open the way to relativism or indifferentism on the one hand (anything is okay as long as it is internally coherent) and dogmatism on the other (we alone have a truly internally coherent system of thought and hence the monopoly on religious truth).

Ecology, broadly understood, is a multidisciplinary area of scientific inquiry that focuses on the relationships and interactions between organisms and their environments.⁷ To do this, it relies on data, analysis, and theory from a variety of scientific domains: biology, physiology, biochemistry, animal behavior, geography, meteorology, and so on. At the core of it all is objective analysis of the needs of individual organisms, since it is these needs that determine survival, and consequently it is upon these needs that evolutionary pressure is exerted in dynamic systems.⁸ This

⁵ For example, understandings of sexual reproduction that reduced the role of the female to that of a passive recipient of the active male seed were used to support misogynistic views of women. See Lucinda Peach, “From Spiritual Descriptions to Legal Prescriptions: Religious Imagery of Woman as ‘Fetal Container’ in the Law,” *Journal of Law and Religion* 10.1 (1993): 77. As a second example, the belief in the superiority of human beings, and their role as having dominion over nature, may have contributed to damaging environmental practices that have had negative consequences not only for the environment but for other human beings; see White, “Historical Roots.” Cf. Willis Jenkins, “After Lynn White: Religious Ethics and Environmental Problems,” *Journal of Religious Ethics* 37.2 (2009): 223–45.

⁶ I have adapted this from Toulmin, who uses a similar example to explain the difference between ethnography and comparative medicine.

⁷ “Ecology, n.” *OED Online* (June 2017), Oxford University Press. Online: <http://www.oed.com/view/Entry/59380?redirectedFrom=ecology> (accessed October 4, 2017).

⁸ John Krebs and Nicholas Davies, “The Evolution of Behavioural Ecology,” in *Behavioural Ecology: An Evolutionary Approach*, (eds.) John Krebs and Nicholas Davies (Oxford: Blackwell, 1997), 3–12. This is a methodological claim. It is not to say that ecology does not also rely on cultural narratives of what nature is or how it ought to function (see later regarding the shift in thinking regarding the balance of nature). In other words, the objective analysis of needs provides data about functioning, but the questions asked and the conclusions drawn, especially where they concern questions about “what is better” or “what is flourishing,” as in conservation biology and restoration ecology, are themselves always also colored by appeals to value systems; see David Robertson and R. Bruce Hull, “Beyond Biology: Toward a More Public Ecology for Conservation,” *Conservation Biology* 15.4 (2001): 970–9.

focus on interactions, grounded in empirical observation of needs and harms, gives ecology remarkable descriptive and explanatory power.

Among the most important lessons we have learned from this descriptive power of ecology is that everything is interconnected. Moreover, it has become increasingly clear that these interconnections are dynamic, not static. Earlier hypotheses of a “balance of nature” have given way to highly complex systems and process thinking that aim to explain not only how things are but also how they change and are changing.⁹ Evolution has developed from being an explanation for the way things are, to being something that is also being studied in action, and even something that ecologists are now seeking to be able to predict.¹⁰

Associated with this development is the realization that human beings can no longer be seen as somehow separate from these dynamic ecological systems or processes. We are not external observers or even rational internal controllers of systems. Rather we are increasingly aware of our own place as part of these evolving interactions, changing and being changed by them.¹¹

Two well-known examples serve to illustrate this point. The first is Rachel Carson’s 1962 book, *Silent Spring*, which presented evidence of the harm caused by bioaccumulation of toxins in the environment from the use of pesticides.¹² Carson argued not only that human activity was harming the environment, but that this activity was ultimately futile and potentially more detrimental to humans because the pests being targeted were evolving to build a resistance to the pesticides. The second example is the work of the Intergovernmental Panel on Climate Change (IPCC), which collates published scientific studies from diverse fields of study to monitor not only climate change but the various factors that contribute to it. The IPCC’s 2014 report has shown that anthropogenic drivers are “extremely likely to have been the dominant cause of the observed warming since the mid-20th century.”¹³

Returning now to the comparison of the anthropologist and the theologian, we can observe that ecology helps us to see that neither of these approaches is adequate on its own. While internal coherency is a necessary and worthy goal of any religion, where such a coherency is not in accord with what we know about the interconnectedness of the world and the role of humans in it, the religion’s truth claims can be called into question—especially where these claims may be contributing to harms of human beings, other organisms, and the environment. No matter how coherent a religious belief system may be, strongly egoistic-anthropocentric conceptions of existence are radically challenged by what we know from ecology, especially the understanding of

⁹ Daniel Simberloff, “The ‘Balance of Nature’—Evolution of a Panchreston,” *PLoS Biol* 12.10 (2014): e1001963.

¹⁰ R.J. Hobbs and S.R. Morton, “Moving from Descriptive to Predictive Ecology,” *Agroforestry Systems* 45.1 (1999): 43–55; Jérôme Chave, “The Problem of Pattern and Scale in Ecology: What Have We Learned in 20 Years?” *Ecology Letters* 16 (2013): 4–16.

¹¹ Steward Pickett, “The Flux of Nature: Changing Worldviews and Inclusive Concepts,” in *Linking Ecology and Ethics for a Changing World: Values, Philosophy, and Action*, (eds.) Ricardo Rozzi et al. (Dordrecht: Springer Netherlands, 2013), 265–79.

¹² Rachel Carson, *Silent Spring* (Boston: Houghton Mifflin, 1962).

¹³ R.K. Pachauri and L.A. Meyer (eds.), *Climate Change 2014: Synthesis Report* (Geneva: IPCC, 2014), 4.

existence as dynamic interconnections of which humans are an integral part, neither external nor in control.

In light of this, the task of theology must be to incorporate this knowledge into religious doctrine in a way that acknowledges not only the needs of human beings (the idea that the natural world is created by God *for* humans, or as the stage for the drama of human spiritual salvation) but also the needs of all of Creation as an interdependent and dynamic process. Since religions claim to explain the world, theology should no longer accept outdated and inaccurate biologies and “ecologies” that have perpetuated the hegemony of egoistic anthropocentrism over other human beings and the natural world. If theology does not do this, then theology is in danger of perpetuating the kind of thinking that has caused the harms highlighted by Carson and the IPCC, which are harms for everything and everyone, and therefore must be counter to any religion that claims that the universe is created by a God who wills the good for that creation. An ecologically attuned theology can address real-world issues in a way that is humble and sincere.

Context and praxis

Ecology can help to renew theology’s focus on context and praxis. The workings of the IPCC show how, methodologically, we need to start with the “case history.” Gathering the relevant facts means that it is far easier to obtain consensus, even if the reasons for why we agree may differ in the end. Theology, too, needs to focus on the context of particular people, particular Christians, this particular history, this particular Earth.

Toulmin considers how medicine forces ethics to refocus on particular cases because

we can understand fully what is at stake in any human situation and how it creates moral problems for the agents involved in it only if we know the precise circumstances “both of the agent and of the act”: if we lack that knowledge, we are in no position to say anything of substance about the situation, and all our appeals to general rules and principles will be mere hot air.¹⁴

Theology, because it necessarily deals with concepts of divine revelation, inspired sacred scriptures, and the authority of certain people or groups as interpreters of that revelation naturally tends toward the formulation of general rules and principles, in matters both of faith and of morals. Consider the various creeds that have been formulated in the Christian traditions. Creeds function as general principles or rules of faith and life that control who is in and who is out of a particular religion or denomination. These general principles necessarily tend to rely on abstract conceptions of humanity and creation. In the Roman Catholic tradition, for example, there is an emphasis on a generalizable and essential human nature. Because God is a rational creator, there is a tendency to see the universe as a statically ordered set of relationships. In other traditions, the

¹⁴ Toulmin, “How Medicine Saved,” 740.

emphasis can be more on God's revelation through scripture: things are true or good simply because God says so.

While it is true that ecology also aims to make generalizable claims, its methodology is typically more inductive than the deductive approaches characteristic of much traditional theology. The implications are significant. The inductive approach of ecology means that generalizable claims must always be grounded in the evidence of particular cases or studies. Moreover, a dialectic exists between what we learn from specific studies and the generalizable claims, such that the generalizable claims can and should be modified in light of new data from particular contexts. Furthermore, ecology, as a discipline grounded in the description of particular interactions, is also aware of the value of the specific and particular in its own right. It is important to study this particular moth, this particular ecosystem. Ecology knows that there is often a price to pay in the quest for a generalizable claim, and that is precisely a consequence of the necessary loss of focus on the details. Put simply, the complexity of ecological interactions is such that as one moves to make more generalizable claims, one simply cannot continue to take account of all of the details at the particular level. It is too complex.¹⁵

The work of the IPCC is again a good example of this methodology of focusing on the particular. As a large-scale intergovernmental body, there can be little doubt that many different general principles and rules could be at play in the governments of the 195 countries that are members. There would almost certainly be some who would wish to deny either climate change or that human activity is a contributing factor. At the other end of the spectrum, there would be those who start from biocentric or environmentalist perspectives insisting on immediate and radical action. Any agreement at the level of the principles (not to mention the level of political and economic ideologies) would be nigh on impossible. However, by seeking "to assess on a comprehensive, objective, open and transparent basis the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts and options for adaptation and mitigation,"¹⁶ the IPCC has been able to reach substantial agreement on climate change and its causes. In other words, a focus on "cases," that is, the objective observations of specific ecological phenomena, has meant that consensus (which is one of the principles governing the IPCC) has been largely possible despite the conflicts that might exist at the level of different ideological principles. Moreover, the focus on particulars has helped the IPCC to carefully highlight those areas where there are still uncertainties, thereby stimulating research to address these.

Theology would, and has, benefitted greatly from this focus on particulars and what in theological terms is called context and praxis.¹⁷ Each person is unique and finds himself or herself in a unique set of life-shaping relationships. While it is possible to make generalizable claims about human nature, this can distract theology from the unique histories and contexts of individual believers and nonbelievers, and their

¹⁵ Matthew Evans, Ken Norris, and Tim Benton, "Predictive Ecology: Systems Approaches," *Philosophical Transactions of the Royal Society B: Biological Sciences* 367.1586 (2012): 163–9.

¹⁶ IPCC, "Principles Governing IPCC Work." Online: <http://www.ipcc.ch/pdf/ipcc-principles/ipcc-principles.pdf> (accessed September 30, 2016).

¹⁷ See Sigurd Bergmann, *God in Context: A Survey of Contextual Theology* (London: Ashgate, 2003).

struggles to come to terms with the meaning and purpose of life, suffering, injustice, and the pursuit of truth, goodness, and beauty. Attending to these things is not to fall into relativism. Like the relationship between particular cases and generalizable principles in ecology, there is a dialectic between praxis and theory, between the particular and the universal, that tries to take both seriously. This approach also accepts that, while consensus may be possible at a generalizable level, consensus should not do so in a way that rides roughshod over the realities and uncertainties that arise from the complexities of particular cases and circumstances.

Roles and their functions

Third, ecology sheds new light on theology and ecclesiology's understandings of roles and their functions in the church and in society. In an effort to stave off the challenges of relativism, theology has often turned to universalizable conceptions of the human person, grounded in essentialist understandings of human nature, to underpin not only moral obligations to others but also the appropriate social structures of society.¹⁸ This turn is not in itself inappropriate, since it is an effective means to ground universal rights and, more importantly, obligations: something that true relativists would deny. It is a double-edged sword, however, because this turn can tend also to a conflation of the functions necessary to the successful operation of the church with the "nature" of the people who perform them.

Consider Aristotle's conception of human nature, which has cast a long shadow over Western civilization. For Aristotle, personhood, that is, one's moral status as a bearer of rights and obligations, was closely tied to one's human nature. Human nature is a rational nature.¹⁹ Those who are rational are citizens and consequently bearers of rights and duties in society. Aristotle, however, did not include all human beings. He claimed that some human beings had imperfect (women) or developing (children) rationality, and therefore they were not of the same political status—nor were tradesmen, slaves, or foreigners.²⁰ For Aristotle, this was essentially so, part of human nature and therefore an immutable reality.

Contemporary political thought, including theological discourse, has expanded the status of personhood, and with it the notion of human dignity, to include all human beings as essentially rational, and it is on this basis that most religions now support something like the United Nations 1948 Universal Declaration of Human Rights.²¹ Nonetheless, the essentialist thinking continues to be used to make distinctions

¹⁸ See, for example, Leo XIII, *Libertas Praestantissimum*, June 20, 1888: Acts of Leo XIII 8 (1888), 237–8; John XXIII, *Pacem in Terris*, April 11, 1963: AAS 55 (1963), 260–1. Note the shift in how essentialism is used to justify the structures of society, from one that still supports traditional hierarchies and the role of the Catholic Church as the state religion to one that endorses universal human rights including a right to religious freedom.

¹⁹ Aristotle, *Nicomachean Ethics*, trans. J.A.K. Thompson. (Harmondsworth: Penguin, 1976), 1098a, 3–7; 1102b.

²⁰ Aristotle, *Aristotle's Politics*, trans. B. Jowett. (New York: Modern Library, 1943), 1260a, 11–14.

²¹ Robert Traer, *Faith in Human Rights: Support in Religious Traditions for a Global Struggle* (Washington, DC: Georgetown University Press, 1991).

between different kinds of human beings and, with it, the functions that they are allowed to serve in society and in religion.²²

Ecology can help theology take cognizance of the difference between the essential nature of a creature and the function it serves in a particular system. Two developments in ecology are useful here. First, the interaction between individuals within a species, between populations of different species, and between species—as individuals and as populations—and their environment has led to philosophical debates about the very concept of a species. Historically, the notion of species was linked to the ways in which ancient Greek philosophy, Aristotle in particular, created hierarchical taxonomies based on shared essential properties.²³ In the eighteenth century, Carl Linnaeus devised a system for the classification of biological organisms using a similar logic. An individual belongs to a species because it shares the same essential properties with other individuals in the group, a species belongs to a genus for the same reasons, and so on up the hierarchy until we reach the relevant kingdom.²⁴ This conception of species has been challenged in light of Darwinian evolution. The very idea of evolution seems contrary to the essentialist notions of species. Consequently, it has been largely replaced by a conception of species as being constituted by historical relationships and by a spatiotemporally continuous lineage.²⁵

Second, while evidence seems to suggest that biodiversity remains important in the stability of ecosystems, the focus has shifted from a simple diversity of species to a diversity of traits and functions in complex systems. In other words, it is not the fact that a particular species is in a system that is important, but rather the function or role that it plays within the system.²⁶ Consequently, a system can be relatively resilient to environmental changes, even if the densities of particular species change or even if new species evolve in response to other environmental pressures.²⁷

These two developments in ecology—namely, that species are defined historically and that functions are important in understanding the resilience of ecosystems—might go some way to explaining, for example, why the saber-toothed cat evolved twice, once from marsupial mammals and once from placental mammals.

If we accept the premise that theology is always situated in a historical community, then ecology can help to temper the negative consequences (such as sexism or moralistic

²² The theology of Hans Urs Von Balthasar is illustrative here in that he considers males to be essentially active and females to be essentially receptive, with the former necessarily prior to the latter, even though he still wants to claim a fundamental equality grounded in creation in the image of God. See, for example, Michelle Gonzalez, “Hans Urs Von Balthasar and Contemporary Feminist Theology,” *Theological Studies* 65.3 (2004): 566–95.

²³ Elliot Sober, “Evolution, Population Thinking, and Essentialism,” in *The Units of Evolution: Essays on the Nature of Species*, (ed.) Marc Ereshefsky (Cambridge, MA: MIT Press, 1992).

²⁴ Peter Takacs and Michael Ruse, “The Current Status of the Philosophy of Biology,” *Science & Education* 22.1 (2013): 5–48.

²⁵ Marc Ereshefsky, “Species, Historicity, and Path Dependency,” *Philosophy of Science* 81.5 (2014): 714–26.

²⁶ Vesna Gagic et al., “Functional Identity and Diversity of Animals Predict Ecosystem Functioning Better than Species-Based Indices,” *Proceedings of the Royal Society B: Biological Sciences* 282.1801 (2015) DOI: <https://doi.org/10.1098/RSPB.2014.2620>.

²⁷ Tom Oliver et al., “Biodiversity and Resilience of Ecosystem Functions,” *Trends in Ecology & Evolution* 30.11 (2015): 673–84.

exclusion) of an exaggerated reliance on essentialism. It is unlikely that essentialist thought can be entirely removed from theology given that the dominant conception of God, at least in the Judeo-Christian traditions, is that God is both transcendent and immanent. This transcendence of God is the basis of various claims about God's essential nature and about the essential nature of human beings created in God's image. Nonetheless, ecology can help theology focus on God's immanence in creation and in history, and particularly the idea that God's relationship with and salvation of human beings takes place in history. Thus, while one might allow for essentialist theological anthropologies (e.g., to stave off moral relativism), one also needs to take into account historical realities, particularly when it comes to ecclesiology.

The church and the societies in which it exists, like natural ecosystems, are all historical realities. Their development and survival may therefore be better understood in terms of necessary functions that might be served by a diversity of kinds of people at different times and places, rather than an insistence that only some essential kinds of people can serve some functions. This can and should be extended beyond the level of different kinds of people—for example, sex, race, mental capacity—to take individual histories into account. Each human being can develop her or his capacities to serve a variety of functions in a given society. Many serve multiple functions, including those that essentialist understandings would say are either impossible or improper: men can be primary carers and women can be university professors, and indeed, both men and women can be both primary carers and university professors at the same time!

While we might legitimately turn to essentialist conceptions of the human person to ground universal rights and obligations, allowing for more historical notions of people and their functions also enables us to take seriously the rights and obligations specific to a given function. These rights and obligations may change during the course of a person's life as her or his functions change. I have different rights and obligations as a father, son, brother, university professor, citizen, and so on. These mostly have little to do with my essential nature as a human male and a lot more to do with the functions that these roles are meant to realize. Lecturing to my children in the way I do to my students as a university professor is probably not the best way to fulfill my role as a father.

Relationships and equity

Finally, ecology renews theology's appreciation of equity, reasonableness, or *epieikeia*,²⁸ in response to the realities of different kinds of relationships and the ways that they change in history. This is particularly relevant to the fields of moral theology and pastoral theology.

In theology, there is a tendency, which is arguably inherent to the discipline, to become very convinced and consequently dogmatic. Recall the examples of the anthropologist and the theologian given earlier. The theologian's need for internal consistency can fuel dogmatism and rigidity. Moreover, theological thought tends

²⁸ Toulmin, "How Medicine Saved."

likewise to be conservative, that is, resistant to change. One explanation for this is that to accept change is to imply the possibility that those who went before—all those venerated as saints—were somehow mistaken and therefore not really saints. If that is so, then the whole system could come crashing down.

This fear of collapse, however, is based on a flawed assumption, namely, that the contexts in which religious truth is played out do not change. If change of context was not a reality, then all Christians would still be living in societies not much different from first-century Israel. Clearly, this is not the case. Truth, while we can affirm it as an objective reality, is nonetheless known and experienced in and through history.

Ecology is aware of this necessary historicity in relation to truth in at least two dimensions: practically and epistemologically. First, at a practical level, ecology is aware of changes in the relationships among species, functions, and the environment over time. These can be slow or rapid and can lead not only to changes in numbers of species or the species that serve particular functions, but to extinctions, evolution of new species, and changes in entire systems. Consequently, what may be a good description of the fauna in the Triassic period would not be a good description of the fauna of the present age. Second, this awareness leads to changes in theories and models to explain and predict phenomena in the world, for example, the shift away from the balance of nature model. At stake is our ability to fully grasp or epistemically capture that any objective truth that may exist in light of all sorts of limitations: our ability to gather data, to calculate the effects of multiple variables in complex systems, the role of different kinds of truth claims, for example, descriptive versus normative, and so on. So, even what we currently consider to be a good description of the fauna of the Triassic period is limited by our access to the fossil record, among other things, and therefore subject to possible revision. Consequently, ecology tends to treat with skepticism any claims to have discovered *the* Truth and instead cautiously affirms what we can know about reality given the limitations of our historicity.

The same practical and epistemological implications of historicity apply to claims about human individuals and human societies. As pointed out already, my roles change over time and consequently so do my relationships and the ways in which I interact with others. What might be fitting behavior at one time and in one kind of relationship might not be at another time. This means that how we grasp truth, and implement it, might be subject to change too or at the very least must be contingent in some meaningful way on concrete historical relationships and our experiences of them.

Moreover, when it comes to normative claims, that is, to what I ought to do in a particular situation, the fittingness will be at least in part determined by the relationships in which I find myself. This includes relationships understood both historically, that is, over time and at that specific moment in time. In other words, the normative claim will not be based solely on some essentialist assertion about my existence, of the kind of being that I am (e.g., free and rational), and of principles deduced from that. The normative claim must also be based on the historical, contingent realities of my past, present, and future functions. Furthermore, these functions may differ dramatically from person to person, even if their present function looks the same. A man who has children from a previous marriage in addition to those from his current marriage has

different duties than a man with no children or only with children from his current marriage, even though in the moment they may both be described as married men.

In response, therefore, to the tendency both within churches and in the public discourse to expect religions to dictate universal, immutable, and binding moral norms for all moral behaviors in order to combat the perceived threat of laxism, indifference, and relativism, the ecological view emphasizes the contingency of these moral norms, in particular, concrete situations. Moreover, the ecological view opens the possibility that different more general norms may develop over time in light of changed roles and relationships.²⁹ Such a view does not deny the reality of objective Truth, nor that there is an objectively true norm or norms for behavior in a given situation. Rather, it highlights how more formal norms, such as *epieikeia*—the norm dictating that one should be just, reasonable, and equitable in one’s dealings with others—must be realized by taking cognizance of the truth of the historical relationships and roles present in each instance. Treating people equitably, then, is not strictly the same as treating people equally. Allowing for this sensitivity in moral theology allows the church to accompany people on their spiritual journey with God and others in less moralistic and less judgmental ways. If it is true that God is love, then this strikes me as an approach eminently preferable to one that forces conformity to concrete norms that do not take into account a person’s own history, current roles, or even the sincerity of her or his search for the Truth in the messy and complex world in which we all live.

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²⁹ An interesting illustration of this is the development of the right to religious freedom in the Catholic Church. See David Schindler, “Freedom, Truth, and Human Dignity: An Interpretation of *Dignitatis Humanae* on the Right to Religious Freedom,” in *Freedom, Truth, and Human Dignity: The Second Vatican Council’s Declaration on Religious Freedom*, (eds.) David Schindler and Nicholas Healy (Grand Rapids: Eerdmans, 2015).

Key Issues in Ecological Theology: Incarnation, Evolution, Communion

Denis Edwards

Global issues such as anthropogenic climate change, loss of biodiversity, and injustice in access to clean water and adequate food are so pressing and of such an all-encompassing nature as to demand a response from the whole academic community, both the sciences and the humanities. Theology, I believe, has its own important but also limited role to play, and the multidisciplinary reflections on ecological theology offered in this volume represent an important step in that direction.

The ecological transformation needed by our world must be informed by the sciences and find expression in culture, politics, economics, and law. But none of this will be achieved unless there is also a transformation of human interiority—human feeling, knowing, and loving—as well as long-term commitments. For those who are Christian believers, this interiority is at least in part shaped by their Christian faith. Ecological theology can function to educate such faith and to call believers to ecological conversion. It can thus provide meaning and motivation for joining with others in ecological commitment and practice. It can help shape an ecological ethos and way of life and provide the foundation for an ecological ethics.

Looking back on what has taken place since the 1970s and reflecting on the work being done more recently lead me to suggest three priorities for today's ecological theology. The first concerns the place of the incarnation in such theology, while the second involves evolution and its costs. The third is an issue that has been central to ecological theology, the theological meaning of the natural world, which I will explore in terms of communion, following the lead of Pope Francis's *Laudato Si'*.

Incarnation

While in the Christian East the threefold interrelationship between God, human beings, and the rest of creation (found in the Scriptures and patristic writers) has

been maintained,¹ in the West, one of these elements—the wider creation—has largely dropped out of view. At least since the Reformation, there has been an almost exclusive focus on humans and God, and on human redemption in Christ, in both Catholic and Protestant preaching and theology. It is understandable, then, that some early studies in ecological theology and spirituality responded to this situation by attending primarily to creation, at times in a blending of creation spirituality and popular science, as in the “new story” of the universe.² These efforts have borne fruit for many people, who have found through them a new vision and deepened commitment to the natural world. However, in some expressions of these approaches—at least at the popular level—there has been such a prioritizing of creation theology over salvation theology that there is little or no place left for Jesus Christ, the incarnation, or salvation in Christ.

From the perspective of the broader Christian tradition, this situation clearly requires further development. A fully Christian approach to the natural world cannot be limited to the theology of creation but must involve both creation and salvation in Christ. If we are to ask about the theological meaning of animals, plants, microbes, and all that makes up the community of life on Earth, as well as of the Milky Way Galaxy and the observable universe, a fully Christian response needs to involve the whole story of God’s self-bestowal to creatures in creation, incarnation, and final transfiguration. The problem with the Western church’s focus on redemption, from an ecological perspective, is not its concern with salvation in Christ, but that it was limited to human salvation, often in a highly individualistic way. What is needed for a rich Christian ecological theology is not a sidelining of salvation in Christ, but an enormous extension of the common view of salvation, so that, faithful to the biblical promise of a new heaven and a new earth, salvation can be seen to involve the whole creation.

Following this line of thought, some ecologically minded theologians have been working toward a theology that seeks to show the profound connection between God’s creative act that enables a universe of creatures to exist and to evolve and God’s saving act in Jesus Christ that promises the fulfillment and transformation of the whole creation. As an important example of this, Ernst Conradie, a Reform theologian at the University of the Southern Cape, led an international, ecumenical group that worked cooperatively on this issue for five years, resulting in a series of publications. Included among these are two edited volumes on the relationship between creation and salvation, the first tracing the issue in the work of classical theologians from Irenaeus to Calvin and the second tracing the relationship in recent movements in Christian theology.³

¹ See, for example, the writings of Ecumenical Patriarch Bartholomew, in *On Earth as in Heaven: Ecological Vision and Initiatives of Ecumenical Patriarch Bartholomew*, (ed.) John Chryssavgis (New York: Fordham University Press, 2012). See also John Chryssavgis and Bruce V. Foltz, *Towards an Ecology of Transfiguration: Orthodox Christian Perspectives on Environment, Nature and Creation* (New York: Fordham University Press, 2013); Elizabeth Theokritoff, *Living in God’s Creation: Orthodox Perspectives on Ecology* (Crestwood, NY: St. Vladimir’s Seminary Press, 2009).

² Thomas Berry, *The Dream of the Earth* (San Francisco: Sierra Club Books, 1988); Brian Swimme and Thomas Berry, *The Universe Story: From the Primordial Flaring Forth to the Ecozoic Age—A Celebration of the Unfolding of the Cosmos* (San Francisco: HarperSanFrancisco, 1984).

³ Ernst Conradie (ed.), *Creation and Salvation*, vol. 1, *A Mosaic of Selected Classic Christian Theologies* (Zurich: LIT, 2012); *Creation and Salvation*, vol. 2, *A Companion on Recent Theological Movements* (Zurich: LIT, 2012).

Another group of theologians has been seeking to show the radical meaning of the incarnation for the whole of creaturely reality through the concept of “deep incarnation.” This idea was introduced by Danish theologian Niels Gregersen, who speaks of it in this way: “The incarnation of God in Christ can be understood as a radical or ‘deep’ incarnation, that is, an incarnation into the very tissue of biological existence, and system of nature.”⁴ Gregersen understands the cross as God’s identification with creation in its evolutionary emergence and as a microcosm of God’s redemptive presence to all creatures in their suffering and death. The concept of deep incarnation has since been taken up by other ecological theologians, including Elizabeth Johnson and Celia Deane-Drummond, who have made use of it in their own distinctive ways.⁵

In my own work on this theme, I found myself going back to Athanasius and finding there a robust theology of incarnation, where the Word in whom all things are created is also the Word of the incarnation, the Word on the Cross.⁶ The concept of deep incarnation can reflect not only the profound insights into the incarnation that Athanasius’s theology represents but also the new insights that come to us today from the sciences, particularly cosmology and evolutionary biology. In this way, we can now see that Jesus of Nazareth was completely dependent upon the evolution of life from its microbial origins 3.7 billion years ago. In him God was made one with all the fruits of evolution by means of natural selection. In light of recent science, we can know that the body of Jesus was made up of atoms produced in the nuclear furnaces of stars so that, like us, Jesus was, and in his resurrected state still is, made from stardust. In light of today’s science, we can know that the body of Jesus depended on the cooperation of the billions of microbes that inhabited it and that it existed only in interdependence with other organisms and with the various systems that sustain life on Earth. In a biological view, it makes no sense to think of one person’s human flesh as an isolated reality.

Reflecting on the incarnation in light of our evolutionary heritage, and the crisis of life on our planet, we are led to a deeper appropriation of the meaning of *God-with-us* in Christ, as a theology of *God-with-all-living-things*. In the Word made flesh, God embraces the whole of finite creaturely existence from within. The incarnation is *God-with-us* in the “very tissue of biological existence” and in the systems of the natural world.

One of the startling implications of the Christian view of the depths of the incarnation is that it is a claim about a God who eternally binds God’s self to flesh and

⁴ Niels Henrik Gregersen, “The Cross of Christ in an Evolutionary World,” *Dialog: A Journal of Theology* 40 (2001): 205. See also Gregersen, “Deep Incarnation: Why Evolutionary Continuity Matters in Christology,” *Toronto Theological Journal* 26.2 (2010): 173–88; Gregersen (ed.), *Incarnation: On the Scope and Depth of Christology* (Minneapolis, MN: Fortress Press, 2015).

⁵ Elizabeth Johnson, “An Earthy Christology: ‘For God so Loved the Cosmos,’” *America* 200.12 (2009): 27–30; Johnson, *Ask the Beasts: Darwin and the God of Love* (London: Bloomsbury, 2014), 191–210; Celia Deane-Drummond, *Christ and Evolution: Wonder and Wisdom* (Minneapolis, MN: Fortress Press, 2009), 128–55; Deane-Drummond, “Where on Earth Is Jesus Christ? Plumbing the Depths of Deep Incarnation,” in *Christian Faith and the Earth*, (eds) Ernst Conradie, Sigurd Bergmann, Celia Deane-Drummond, and Denis Edwards (London: Bloomsbury T&T Clark, 2014) 31–50. See also Denis Edwards, *Ecology at the Heart of Faith* (Maryknoll, NY: Orbis, 2006), 52–64; *Partaking of God: Trinity, Evolution and Ecology* (Collegeville, MN: Liturgical Press, 2014), 54–67.

⁶ Edwards, *Partaking of God*, 11–67.

to matter. In a thoroughly incarnational theology, God is understood as becoming *forever* a God of matter and flesh. This is the implication of the Christian doctrines of the resurrection and the ascension. The Word is made flesh, and matter and flesh are irrevocably taken to God and embedded forever in the life of the divine Trinity. The incarnation and its culmination in the resurrection and ascension of the crucified Jesus mean that the Word of God is forever matter, forever flesh, forever a creature, forever part of a universe of creatures, but is a part of all of this that is now radically transfigured. As the firstborn of the new creation, the risen Christ is the beginning of the deifying transformation of the whole universe of creatures in God. Karl Rahner has said of the risen Christ:

No, he is risen in his body. That means: He has begun to transfigure this world into himself; he has accepted this world forever; he has been born anew as a child of this earth, but of an earth that is transfigured, freed, unlimited, an earth that in him will last forever and is delivered from death and impermanence for good.⁷

The Word is made flesh, and matter and flesh are taken to God irrevocably. God is forever part of evolutionary history on this planet and forever part of a universe of creatures.

Thomas Torrance says that the incarnation means “God has decisively bound himself to the created universe and the created universe to himself, with such an unbreakable bond that the Christian hope of redemption and recreation extends not just to human beings but to the universe as a whole.”⁸ Aspects of this view of the incarnation can be found in the recent teachings of Pope John Paul II and Pope Francis. In his encyclical on the Holy Spirit, John Paul II writes: “The incarnation of God the Son signifies the taking up into unity with God not only of human nature, but in this human nature, in a sense, of everything that is ‘flesh’: the whole of humanity, the entire visible and material world. The incarnation, then, also has a cosmic significance, a cosmic dimension.”⁹

In *Laudato Si'*, Pope Francis speaks of the Word of God who “entered into the created cosmos, throwing in his lot with it, even to the cross” (§99).¹⁰ Several times he focuses on the risen Christ at work in the whole creation. In one example, after referring to Col. 1:19–20 and 1 Cor. 15:28, he writes:

Thus the creatures of this world no longer appear to us under merely natural guise because the risen One is mysteriously holding them to himself and directing them towards fullness as their end. The very flowers of the field and the birds which his

⁷ Karl Rahner, “A Faith That Loves the Earth,” in *The Mystical Way in Everyday Life: Sermons, Essays and Prayers*, (eds.) Annemarie Kidder (Maryknoll, NY: Orbis, 2010), 55. See also Rahner, “The Specific Character of the Christian Concept of God,” in *Theological Investigations*, 21 (New York: Crossroad, 1988), 191.

⁸ Thomas Torrance, *The Christian Doctrine of God: One Being Three Persons* (Edinburgh: T&T Clark, 1996), 244.

⁹ John Paul II, *On the Holy Spirit in the Life of the Church and the World: Dominum et Vivificantem* (Boston: Pauline Books and Media, 1986), \$50, \$86.

¹⁰ All parenthetical references from Pope Francis, *Laudato Si': On Care for Our Common Home* (Strathfield: St. Paul's Publications, 2015).

human eyes contemplated and admired are now imbued with his radiant presence (§100).

Later, discussing the sacraments, he writes: “For Christians, all the creatures of the material universe find their true meaning in the incarnate Word, for the Son of God has incorporated in his person part of the material world, planting in it a seed of definitive transformation” (§235). At another point, he offers a picture of this transformed existence: “Eternal life will be a shared experience of awe, in which each creature, resplendently transfigured, will take its rightful place and will have something to give those poor men and women who will have been liberated once and for all” (§243).

Evolution

A second priority in the recent work of ecological theologians has been the attempt to deal responsibly with evolutionary science.¹¹ How are we to think about God’s creative and saving action in the processes of the emergence of the universe over the last 13.7 billion years and the evolution of life on Earth over the last 3.7 billion years? If God acts through the Word and in the Holy Spirit, how might we think about this action in an evolving world? In seeking to develop a Christian theology of the natural world in light of evolution, I find it meaningful to think of the Spirit as the Energy of Love at work in the process of the emergence of the universe and the evolution of life on Earth; likewise, we might understand the Word of God as both the Attractor of evolutionary emergence and also as the Word incarnate who, crucified and risen, draws all things to their transfigured eschatological fulfillment.¹² In such a theology, the Creator Spirit can be seen as immanently present to all the entities of our universe, enabling creatures to exist, interact, and evolve by means of the laws of nature and the processes discussed in the natural sciences. The capacity for emergence, for increase in complexity through self-organizational processes, and for the evolution of life by means of natural selection is interior to creaturely reality. It belongs to the natural world. The capacity for emergence comes from within. At the empirical level of science, the emergence of the new is completely open to explanation at the scientific level. But, theologically, this capacity can be understood as the gift of the Spirit’s empowering, life-giving, and loving presence to creatures, in the relationship of continuous creation.

For biblical faith, the Spirit is the “vivifying and energizing power of God” immanently present to all things.¹³ The life-giving Spirit can be seen as breathing life into the laws of nature and into all the natural processes by which the universe and all

¹¹ A leading figure in this work is John Haught; see, for example, *God after Darwin: A Theology of Evolution* (Boulder, CO: Westview Press, 2000) and *Making Sense of Evolution: Darwin, God and the Drama of Life* (Louisville, KY: Westminster: John Knox Press, 2010). Important recent contributions are Johnson, *Ask the Beasts*, and Celia Deane-Drummond, *The Wisdom of the Liminal: Evolution and Other Animals in Human Becoming* (Grand Rapids: Eerdmans, 2014).

¹² This subject is treated more fully in Edwards, *Partaking of God*, 74–87.

¹³ John McKenzie, “Aspects of Old Testament Thought,” in *The New Jerome Biblical Commentary*, (eds.) Raymond Brown, Joseph Fitzmyer, and Roland Murphy (Boston, MA: Pearson, 1989), 1291.

of life on Earth emerge. For a Christian, this Spirit can be seen as the divine energy of love at work in the origin of the observable universe, in the birth of galaxies and stars, in the development of our solar system around the young Sun, in the origin of the first microbial life on Earth, in the flourishing of life in all its diversity, and in the emergence of humans with their capacity for self-consciousness and interpersonal love.

In suggesting that the Word of God can be seen as the Attractor, I am adopting an image from the philosopher of science and Archbishop of Lublin, Josef Zycinski.¹⁴ He suggests thinking of God as the “Cosmic Attractor” of evolution.¹⁵ He points to the use of the concept of the attractor in the physics of nonlinear systems in which the system is found to be drawn to a particular state: “The essential factor in this process is the dynamic by which the system is directed locally toward a physical state which is as yet unrealized, but nevertheless gives the appearance that it is ‘attracting’ to itself, at the given stage, the evolution of the system to itself.”¹⁶

In a trinitarian theology of creation, I see the eternal Word of God as the divine Attractor in the evolutionary emergence of the universe and its individual entities. The incarnate Word of God, Jesus risen from the dead, is the Attractor not only of evolutionary emergence but also of the final transformation and fulfillment of the universe of creatures. This attraction of the Word is not a physical force and not something that could be discovered empirically. It is God’s creative and saving action that enables a creaturely world to exist and evolve and brings it to its fulfillment.

The Word, then, can be understood as the divine Attractor, drawing into being galaxies, stars, and planets, and then, on Earth, through the evolutionary processes described in the sciences, all the diverse species of microbes, insects, birds, fish, plants, and animals, including human beings. The divine Word draws each species to its own identity and place in evolutionary emergence. Not just each species, but each member of each species, each sparrow, is held in the divine memory and embraced in the divine love, as a word of the Word, an expression of divine Wisdom in our world.

In this view, then, the incarnation of the Word is the incarnation of the Attractor of evolutionary emergence. As John’s Gospel tells us, all things were made through the Word of God (Jn 1:3), and this Word of creation is made flesh in our midst (Jn 1:14). In terms of the proposal being made here, then, this incarnate Word, the crucified and risen Christ, can be understood as the Attractor of the whole creation, not just to its evolutionary existence but to its transfiguration and fulfillment. And the Holy Spirit is the enabling power at work in this whole process—the very attraction, the drawing power of love, the life-giving presence at work in it all.

One of the advantages of the analogy of the Attractor is that it can be understood in a nonanthropomorphic way, pointing to the fulfillment and transfiguration of a cosmic world far beyond the human. But it also has another advantage. The analogy

¹⁴ The concept of God and of Christ as “strange attractor” is used by Ilia Delio, *The Humility of God: A Franciscan Perspective* (Cincinnati: St. Anthony Messenger Press, 2005), 75–85 and *The Emergent Christ: Exploring the Meaning of Catholic in an Evolutionary Universe* (Maryknoll, NY: Orbis, 2010), 142–6.

¹⁵ Józef Zycinski, *God and Evolution: Fundamental Questions of Christian Evolutionism* (Washington, DC: Catholic University of America Press, 2006), 161–4.

¹⁶ *Ibid.*, 162.

of the attractor can also carry a human and personal meaning. The gospels tell of Jesus who attracts great crowds in Galilee, adults and children as well. He draws followers to himself, involving them in a lifelong relationship. In language that echoes the biblical tradition of Wisdom, Jesus draws to himself all those who struggle in life with weariness, pain, and grief: “Come to me, all you that are weary and are carrying heavy burdens, and I will give you rest. Take my yoke upon you, and learn from me; for I am gentle and humble in heart, and you will find rest for your souls. For my yoke is easy, and my burden is light” (Mt. 11:28–30). A profound theology of Jesus as the divine Attractor is found in John’s Gospel, particularly in the image of Jesus lifted up and attracting all to himself as the crucified and risen one: “And I, when I am lifted up from the earth, will draw all to myself” (Jn 12:32).

An evolutionary theology of creation, then, can be developed as a trinitarian theology of God creating through the Spirit as the Energy of Love and the Word of God as the Attractor in both creation and new creation. But theology in dialogue must also attempt to deal with the costs built into the process of evolution: the loss, the pain, the predation, the deaths, and the extinctions of most species that ever lived over the 3.8-billion-year history of life.¹⁷ If modern humans emerged only in the last 200,000 years, then all of these costs cannot be reasonably attributed to human sin, as many Christians have done in the past. It seems the responsibility for the costs of evolution rests with the Creator—at least for those who believe in God. An evolutionary view of the world thus intensifies the age-old theological problem of evil because of the sheer scale of the suffering because it seems intrinsic to the process and because it seems the Creator is responsible. Why does God create in a way that is so devastatingly costly for so many creatures? Perhaps part of the answer is that this is who we are. Could we be who we are in some other kind of creation?

In my view, we have no adequate intellectual answer to the problem of the suffering that is built into the natural world. But an evolutionary theology of God must address the issue as best it can. It needs to be able to speak of the God of boundless compassion revealed in Jesus, and in his cross, as also the God of evolutionary emergence. It needs to be able to proclaim that God hears the groaning of creation, embraces the world of creatures in the incarnation and in the cross, and promises creation’s deliverance and fulfillment in the risen Christ. So I think that God’s identification with a suffering world in the cross, and God’s promise of a transfigured world in the resurrection, are fundamental to any Christian discussion of the costs of evolution.

In addition, I think it is essential to be able to say that God cares passionately about creation and suffers with it in its groaning. I believe that the ancient tradition of divine impassibility has an abiding place in theology, but I think we can speak, with Origen, of God’s eternal, constant passion of love for creatures. The eternal Word came to us,

¹⁷ On the costs of evolution, see Nancy Murphy, Robert John Russell, and William Stoeger (eds.), *Physics and Cosmology: Scientific Perspectives on the Problem of Natural Evil* (Vatican City: Vatican Observatory Publications, 2007); Christopher Southgate, *The Groaning of Creation: God, Evolution, and the Problem of Evil* (Louisville, KY: Westminster John Knox, 2008). For examples of recent responses from ecological theologians, see Deane-Drummond, *Christ and Evolution*, 159–93; Denis Edwards, *How God Acts: Creation, Redemption, and Special Divine Action* (Minneapolis, MN: Fortress Press, 2010); Johnson, *Ask the Beasts*, 181–235.

Origen insists, out of the divine “passion of love.” When we pray to the eternal Father, he says, the Father has pity and compassion, and suffers the “passion of love,” and is with us in our need.¹⁸

At the heart of the Christian tradition, there is Jesus’s own image of this divine compassion, or “passion of love,” in his wonderfully vivid picture of the father in the parable of the Prodigal Son: “But while he was still far off, his father saw him and was filled with compassion; he ran and put his arms around him and kissed him” (Lk. 15:20). Not only this text but also all the liberating words and healing actions of Jesus, and above all the culmination of this life lived in love in the cross, witness to this same divine compassion. This same divine attribute was long expressed in the faith of Israel, at times in the idea of God’s womb-like mercy and the image of God as Mother: “As a mother comforts her child, so will I comfort you” (Isa. 66:13).

With Origen, then, I think it is appropriate to speak of God’s passion of love and of God who suffers with creation in the sense that God feels with human beings in their need and for the whole creation in its groaning. The words “suffer with” and “passion of love” are used of God strictly analogically, which means that the infinite difference between human experience and divine love is fully recognized, and these qualities are affirmed of God in a way that transcends all human experience of them. The divine passion of love is infinitely beyond human capacities for empathy with others. The passionate love of God-with-us expressed in the cross of Jesus represents the transcendent God’s presence-in-love with all suffering creatures and promises them their own participation in resurrection life. Such a claim does not offer an intellectual answer. It is more a matter of clinging to the conviction that it is the passion of divine love revealed in Jesus, in his life, death, and resurrection, which is mysteriously at work in the whole process, in spite of our incomprehension. It is only this, I believe, that enables us as Christians to affirm in trust that the evolution of life, in spite of its violence that coexists with its beauty, and in spite of our not being able to explain why things are the way they are, is nevertheless the work of divine love, the work of a God who loves this creaturely world with the divine passion of love.

The communion of creation—a theology of the natural world

The issue I have been discussing—evolution and its costs—is not the focus of Pope Francis’s *Laudato Si’*, but the theological understanding of the natural world is central to the encyclical. It is particularly here, I believe, that the encyclical has a great deal to offer those searching for a contemporary ecological theology. I will point to what I see as three threads of a theology of the natural world that run through *Laudato Si’*: nonhuman creatures (1) have value in themselves, (2) reveal the Creator, and (3) form with us a sublime communion in God.¹⁹

¹⁸ Origen, “Homilies on Ezekiel,” 6.3 in *Homilies 1–14: On Ezekiel*, trans. Thomas Scheck, Ancient Christian Writers 62 (New York: Newman Press, 2010), 92–3.

¹⁹ This is treated more fully in “‘Sublime Communion’: The Theology of the Natural World in *Laudato Si’*,” *Theological Studies* 77 (2016): 377–91.

The value of nonhuman creatures in themselves

A fundamental question for any ecological theology is that of the meaning and value of nonhuman creatures. Do they have value in themselves, or do they simply exist for human use? The Catholic tradition has tended to see animals and plants as ordered to the human and as provided for human use. Taken alone and out of context, of course, this can be a recipe for exploitation. In *Laudato Si'*, Pope Francis addresses this issue head-on and, building on biblical faith and the broad Christian tradition, contributes something new to formal Catholic Church teaching in his unambiguous claim that other creatures have value in themselves (intrinsic value).

This claim that other creatures have meaning and value in themselves appears throughout the encyclical, beginning from its opening chapter where Francis discusses the loss of biodiversity. He points out that the extinction of species will clearly mean the loss of valuable resources for human beings in food and medicines. But it is not enough, he says, to think of animals, plants, reptiles, insects, and microorganisms as resources for human beings “while overlooking the fact that they have value in themselves” (§33). We need to consider that, as a result of human actions, “thousands of species will no longer give glory to God by their very existence, nor convey their message to us” (§33). Later the pope writes: “In our time, the Church does not simply state that other creatures are completely subordinate to the good of human beings as if they had no worth in themselves and can be treated as we wish” (§69). He says of ecosystems as well as individual creatures: “They have an intrinsic value, independent of their usefulness” (§140).

The traditional idea that other creatures can be considered gifts of God for human use is not denied in *Laudato Si'*, but it is embraced within a theology that sees them as having their own God-given meaning and value. An important question arises at this point: What is the theological basis for this concept of intrinsic value? I find three answers offered in *Laudato Si'*. A first is simply the fact that each creature and the whole of nature is the place of God's presence: “The universe unfolds in God, who fills it completely. Hence there is a mystical meaning to be found in a leaf, in a mountain trail, in a dewdrop, in a poor person's face” (§233). A second reason for attributing intrinsic value to other creatures is that God loves each of them. Each is the object of God's tender love: “Every creature is thus the object of the Father's tenderness, who gives it its place in the world. Even the fleeting life of the least of beings is the object of his love, and in its few seconds of existence, God enfolds it with his affection” (§77). A third reason is found in the final fulfillment of these other creatures: they are moving with us and through us “towards a common point of arrival, which is God, in that transcendent fullness where the risen Christ embraces and illumines all things” (§83).

Other creatures reveal God

While this first thread should be seen, in my view, as a development in church teaching, one that is in agreement with a great deal of recent ecological theology, the second thread is not so much a development as a return to a traditional idea: other creatures

can be revelatory of God, constituting a book of creation alongside the book of the Bible. In this second thread, the emphasis is no longer on the meaning of creatures in themselves but on their revelatory meaning for human beings. Francis sees the universe of creatures as speaking words of love to us: “The entire material universe speaks of God’s love, his boundless affection for us. Soil, water, mountains: everything is, as it were, a caress of God” (§84).

Each creature has its word to speak. None is superfluous. Each can become a caress of God for us. Taking up words of John Paul II, Francis writes: “God has written a precious book, ‘whose letters are the multitude of created things present in the universe’” (§85). He turns to the Canadian bishops who, he says, rightly point out that “no creature is excluded from this manifestation of God” (§85). He quotes their words: “From panoramic visions to the tiniest living form, nature is a constant source of wonder and awe. It is also a continuing revelation of the divine” (§85). The contemplation of creation allows us to discover in each thing “a teaching,” which God wishes to give to us. Francis again refers to words of John Paul II: “Alongside revelation properly so-called, contained in Scripture, there is a divine manifestation in the blaze of the sun and the fall of night” (§85). In this context, Francis points to an important text in St. Thomas Aquinas, where he teaches that the multiplicity and variety of creatures springs from the divine intention, since no one creature could adequately represent the divine goodness.²⁰ No doubt Francis agrees with John Paul II, in the quotation earlier, in making a distinction between “revelation properly so-called” and the manifestation of God in the natural world around us, but he nevertheless insists that there is a fundamental revelation of God at work in creation itself.

The teaching of *Laudato Si’* on the book of creation is beautifully summed up by Francis when he writes that “nature is filled with words of love” (§225). But, he goes on to say, in order to hear the words of love addressed to us in birds, trees, flowers, mountains, beaches, and deserts, we will need to cultivate a contemplative stance before God’s creation. How can we listen to the words spoken in the creatures around us if our lives are dominated by “constant noise, interminable and nerve-wracking distractions, and the cult of appearances?” (§225). We need to free ourselves from constant noise and busyness if we are to hear the word of love being spoken to us in the creature before us.

The sublime communion of creation

The third thread for a theology of the natural world is Francis’s integrating concept of the communion of creation. This theme is developed explicitly in chapter two and reappears in various ways throughout the encyclical. Even without the theological language of communion, it appears in the constant emphasis on the threefold interrelationship with human beings, with other creatures, and with God. An example is when Francis says of the biblical creation texts: “They suggest that human life is

²⁰ Thomas Aquinas, *Summa Theologiae* 1 (New York: Benziger, 1947), 47, 1.

grounded in three fundamental and closely intertwined relationships: with God, with our neighbour, and with the earth itself” (§66).

Over and over again in *Laudato Si'*, we are told that everything is connected. Francis locates human beings as part of the natural world: “Nature cannot be regarded as something separate from ourselves or as a mere setting in which we live. We are part of nature, included in it and thus in constant interaction with it” (§139). For our continued existence, we depend not only on the climate, the atmosphere, the seas, the rivers, and the land itself, but also on the plants, the animals, the birds, the bees, the insects, the worms, and the millions of microbes that are at work in each of our bodies. Francis grounds these interconnections in a deeply theological way, pointing out that when we think of nature as God’s creation, we can see it as “a reality illuminated by the love that calls us together into universal communion” (§76).

In theological discussions, the word communion usually points, first, to the divine life of the Trinity and, second, to what the Spirit brings about in the life of the church. Francis extends its use to embrace the whole creation drawn by divine love. The networks of relationships that science discovers at every level, from that of atoms to molecules, cells, organisms, ecosystems, the planetary community, the Milky Way Galaxy, and the observable universe, can then be seen in a new light, as creaturely participation in the divine communion, which is the life of the triune God. So the pope writes: “This is the basis of our conviction that, as part of the universe, called into being by the one Father, all of us are linked by unseen bonds and together form a kind of universal family, a sublime communion which fills us with a sacred, affectionate and humble respect” (§89).

It seems that the pope is taking up Francis of Assisi’s idea of the kinship of creatures with the language of “universal family,” and complementing it with the further theological concept of “sublime communion.” It is worth noting that here, as elsewhere in his writing, Francis gives priority to feelings that are far from common in church teaching. As referenced earlier, the sense that we belong to one universal family, to one sublime communion, he says, fills us with a “sacred, affectionate and humble respect” (§89). He is clearly aware that such feelings can inspire ecological conversion and an ecological lifestyle.

He insists that our sublime communion with the rest of creation also necessarily involves us in feeling with suffering human beings: “A deep communion with the rest of nature cannot be real if our hearts lack tenderness, compassion and concern for our fellow human beings” (§91). As Francis says earlier in *Laudato Si'*, we need to realize that “an ecological approach *always* becomes a social approach” (§49). In words that had been used earlier by Leonardo Boff, Francis insists on the integration of the issues of justice and the environment “so as to hear *both the cry of the earth and the cry of the poor*” (§49).²¹ This integration is a central idea of the encyclical and is taken up explicitly in its fourth chapter on “Integral Ecology.”

When our hearts are open to universal communion, Francis says, the sense of family “excludes nothing and no one” (§92). We “have only one heart” that feels for our fellow human beings and for other creatures who are brother and sister to us:

²¹ Italics in original. See Leonardo Boff, *Cry of the Earth, Cry of the Poor* (Maryknoll, NY: Orbis, 1997).

“Everything is related and we human beings are united as brothers and sisters on a wonderful pilgrimage, woven together by the love God has for each of his creatures and which also unites us in fond affection with brother sun, sister moon, brother river and mother earth” (§92).

The concept of universal communion appears again in the final chapter of *Laudato Si'* when Francis discusses the ecological conversion to which we are called. He sees this conversion as involving a number of attitudes that together foster a “spirit of generous care, full of tenderness” (§220). This conversion involves, he says, “a loving awareness that we are not disconnected from the rest of creatures, but joined in a splendid universal communion” (§220). He calls upon all Christians to make the grace God has given them evident in their relationships with other creatures: “In this way, we will help nurture that sublime fraternity with all creation which Saint Francis of Assisi so radiantly embodied” (§221). It is clear that the “sublime fraternity” of this text echoes and reinforces the “sublime communion” of paragraph 89, referred to earlier.

This vision of the communion of creation, immensely deepened by a theology of incarnation and resurrection, impels us to give ourselves to the care of our common home. God has taken Earth and its creatures to God’s self irrevocably in the incarnation. In words that echo Karl Rahner, Francis writes: “In the heart of this world, the Lord of life who loves us so much, is always present. He does not abandon us, he does not leave us alone, for he has united himself definitively to our earth, and his love constantly impels us to find new ways forward” (§245).²²

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²² Rahner, “A Faith That Loves the Earth,” 55.

Part Two

Social Science

Creation and Creativity

Mark G. Hayes

While recognizing the benefits of economic growth and acknowledging that business enterprise can be a noble vocation, the general tenor of *Laudato Si'* is critical of the performance of market economies and, still more so, of market economics.¹ This calls into question the consistency of Pope Francis's second encyclical: is it possible to enjoy the benefits of advanced technology without the Schumpeterian process of "creative destruction" that economists argue is the mainspring of technological innovation? Can we have the benefits without granting entrepreneurs the freedom to introduce disruptive technologies that undermine their established competitors and destroy traditional livelihoods? How is this consistent with a commitment to protect employment and the stability of income needed for families to flourish? What would be the implications of giving the same priority in economic policy to the dignity, as well as the creativity, of the human person within a framework of the common good? What are the implications for business and economic policy of a personalist approach within an integral ecology?²

This chapter begins by considering the nature of economic growth and its apparent inconsistency with the message of *Laudato Si'*. The matter is more complex than first appears and involves the profound question of human agency: could history have been different, and if so, can the future take a different path?

The following section considers the nature of the modern corporation, arguing that the secular doctrine of the primacy of shareholder value represents the idolatry named by Pope Francis in *Evangelii Gaudium*.³ Catholic Social Thought about the nature of human work helps identify the type of legal reform needed to permit corporations to adopt a wider purpose consistent with an integral ecology. The privilege of incorporation must coincide with a recognition of business as a community of enterprise, including

¹ Pope Francis, *Laudato Si': On Care for Our Common Home* (London: Catholic Truth Society, 2015), §109.

² "Personalist" in the sense of Pope Benedict XVI, *Caritas in Veritate* (London: Catholic Truth Society, 2009), §68, §76. An "integral ecology" is one that includes the human and social dimensions beside the natural, c.f. *Laudato Si'*, §4.

³ Pope Francis, *Evangelii Gaudium* (London: Catholic Truth Society, 2013), §§55–6.

both shareholders and workers, that serves society as a whole through the responsible provision of wholesome goods and services.

The penultimate section turns to the nature of and remedies for the unemployment generated as a necessary by-product of economic growth, first briefly comparing the very different approaches of the UK and Denmark and their foundation in different theories of the economy. This leads on to the practical case of a corporation based explicitly on Catholic Social Thought, the Mondragon Corporation, and its approach to technical progress and technological unemployment. The conclusion is that the path of human progress is not determined by iron laws and that we are free to choose another: the problem is the need for an ecological conversion if we are to do so.

The nature of economic growth

It does not require an ideological commitment to Marxism to recognize that in nearly all historical human societies, those with power and ability have organized affairs in such a way as to generate and capture a surplus for themselves. Initially this was by military means alone, as in the cattle raids between the extended families of the Bronze Age. Under the Roman Empire, the source of the surplus was more enduring, based on taxation and slavery. In the Middle Ages, the ownership of land, combined with increasingly productive agriculture, generated rents from a peasant population for the nobility and the church.

Throughout these centuries, the rate of economic growth was very low—economic growth being conventionally measured as the growth of income per head of the population. The main source of economic growth is technical progress or human creativity. Progress there certainly was, but the increased production (still predominantly agricultural) was matched by increases in population so that income per head remained stable for millennia. Thomas Malthus, the first Cambridge economist according to John Maynard Keynes, made his name by identifying the tension between the growth of population and the cultivable land. The “Malthusian trap” appears to describe the experience of the ancient and medieval world: there is progress and total production and income increase, but population keeps pace. Furthermore, as was shown by David Ricardo, Malthus’s friend and interlocutor, diminishing returns to increasingly intensive cultivation lead to both a reduction in the wages of labor and the appropriation of an increasing share of income by landlords.

Around 1500 in England, partly influenced by the Italian Renaissance, things began to change.⁴ A new spirit of competition and individual enterprise began to rise, which ultimately found its voice and moral legitimacy in Adam Smith’s *The Wealth of Nations*. The enclosure of common land undermined the traditional system of agriculture but allowed enterprising landlords to invest their increasing surplus in

⁴ On the possible connection between the origins of capitalism and the civil market economy of the Italian Renaissance, see Stefano Zamagni, “Catholic Social Thought, Civil Economy, and the Spirit of Capitalism,” in *The True Wealth of Nations: Catholic Social Thought and Economic Life*, (ed.) Daniel Finn (Oxford: Oxford University Press, 2010).

improvements that led to further gains in agricultural productivity. For the first time, the surplus was spent not simply on large households, luxurious living, the military, public buildings, and the church, but on investment in physical capital embodying new techniques of production with a view to profit. So was “capitalism” born, alongside the emergence of its mercantile variety across Europe as trade, banking, and industry grew in importance. The rising population, pushed by rural poverty and pulled by new opportunities, began to shift from the country to the cities.

Around 1750, there was a further change of tempo. Although Hero of Alexandria invented the steam engine in the first century AD, it was James Watt’s perfection of the technology in 1769 that symbolized the start of a new era. The new technology allowed the harnessing of nonanimal energy on an unprecedented scale, providing the foundation of our increased income today. We now use about ten times the energy per head that people did 400 years ago. It is no accident that the exponential growth of global income since 1750 matches the growth of CO₂ emissions. Although energy can be generated without emitting CO₂, in practice it was the abundance of coal in Northern England, combined with the acceptance of capitalist institutions and the control of trade routes by the British Navy, that provided the conditions for the Industrial Revolution, which continues to this day. It was fossil fuel energy that allowed the world to break out of the Malthusian trap.

The lives of British working people were transformed. No longer tied to the land or masters as peasants, slaves, or journeymen, labor became free. Free to starve, as Marx pointed out, but also free to move to better-paid employment. Conversely, masters and landlords no longer felt responsible, even in principle, for their people. Under capitalist rules, an entrepreneur has the right to start up a new business in competition with existing producers, even if it puts their competitors out of business and their workers out of jobs. This was precisely what the medieval guild system aimed to prevent. John Stuart Mill argued that competition was always in the best long-term interests of the poor and we hear similar arguments today. Sheila Ogilvie provides a representative modern economist’s view that the guilds allowed privileged producers to capture monopoly rents at the expense of excluded workers and consumers.⁵ Similar arguments are levelled against today’s labor unions and Fair Trade organizations.

Joseph Schumpeter considered the essence of capitalism to be the “gale of creative destruction” by which new entrants continually drive out the incumbents in an industry through competition based on technical innovation. Some 15 percent of jobs are currently destroyed and replaced by new jobs each year.⁶ From handloom weavers and ostlers, through coal miners and typists, to taxi-drivers (Über) and hotelkeepers (AirBnB), the relentless pace of innovation and competition has brought a wider variety of goods and services at lower cost, increasing the income of society as a whole at the cost of insecurity and often great hardship for generations of displaced workers and their families.

⁵ Sheila Ogilvie, “The Economics of Guilds,” *Journal of Economic Perspectives* 28.4 (2014): 169–92.

⁶ John Haltiwanger, Stefano Scarpetta, and Helena Schweiger, *Assessing Job Flows Across Countries: The Role of Industry, Firm Size and Regulations* (Bonn: Institute for the Study of Labor, 2006), 10.

How do *Laudato Si'* and the church's social thought in general square with this brief sketch of economic history? Pope Francis notes that "we are the beneficiaries of two centuries of enormous waves of change ... It is right to rejoice in these advances and to be excited by the immense possibilities which they continue to open up before us, for 'science and technology are wonderful products of a God-given human creativity' ... Technology has remedied countless evils which used to harm and limit human beings."⁷ Yet he deplores the "technocratic paradigm," suggesting that

Men and women have constantly intervened in nature, but for a long time this meant being in tune with and respecting the possibilities offered by the things themselves. It was a matter of receiving what nature itself allowed, as if from its own hand. Now, by contrast, we are the ones to lay our hands on things, attempting to extract everything possible from them while frequently ignoring or forgetting the reality in front of us. Human beings and material objects no longer extend a friendly hand to one another; the relationship has become confrontational. This has made it easy to accept the idea of infinite or unlimited growth, which proves so attractive to economists, financiers and experts in technology.⁸

The technocratic paradigm also tends to dominate economic and political life. The economy accepts every advance in technology with a view to profit, without concern for its potentially negative impact on human beings. Finance overwhelms the real economy.⁹

On the impact on working people, he writes:

It is essential that "we continue to prioritize the goal of access to steady employment for everyone," no matter the limited interests of business and dubious economic reasoning ... yet the orientation of the economy has favoured a kind of technological progress in which the costs of production are reduced by laying off workers and replacing them with machines ... economies of scale, especially in the agricultural sector, end up forcing smallholders to sell their land or to abandon their traditional crops.¹⁰

There appears a certain inconsistency in rejoicing in the fruits of technical progress while deploring the historical process by which it has come about. The reference to an earlier time when men and women worked in harmony with nature suggests nostalgia for an imaginary pre-capitalist medieval tranquility. It was precisely the capitalist entrepreneur who laid his hands on things, seizing "hold of the naked elements of both nature and human nature." The rules of capitalism permit technical innovation for profit without concern for the negative impact on the human beings employed by competitors or made redundant when new technology is introduced. The displacement

⁷ Pope Francis, *Laudato Si'*, §102.

⁸ *Ibid.*, §106.

⁹ *Ibid.*, §109.

¹⁰ *Ibid.*, §127–9.

of small-scale agriculture and the loss of traditional livelihoods were the essence of the first English Agricultural Revolution, and indeed of the process of industrialization and urbanization across the world ever since.

Accordingly, these passages in *Laudato Si'* can be read as a rejection of capitalism itself, not simply of the particular form (dominated by large corporations and financial markets) that it takes at our present time. Was then the Industrial Revolution a mistake? Faith in the God of history seems to preclude this, while acknowledging the reality of evil in all human affairs before and since the Incarnation and indeed the possibility of apocalyptic destruction culminating in the Parousia. Yet there can be no moral culpability for burning coal or oil while the world remained unaware of its invisible effects on the climate; most societies, sooner or later, have addressed the tangible effects of atmospheric pollution, such as smog and acid rain, at least when they became intolerable for the rich. Could the changes from old to new types of work required by technical progress have been made purely by consent without forced unemployment? Is Pope Francis arguing there was another path not taken, a counterfactual that we cannot know?

Michael Novak suggests that we already have a natural experiment in the contrast between the histories of economic development in North and Latin America; in his analysis, the church's greater influence over society in Latin America has not proved beneficial. He writes:

It is a sad commentary ... that so few theologians or religious leaders understand economics ... Many seem trapped in pre-capitalist modes of thought. Few understand the laws of development, growth and production. Many swiftly reduce all morality to the morality of distribution. They demand jobs without comprehending how jobs are created. They demand the distribution of the world's goods without insight into how the store of the world's goods may be expanded. They desire ends without critical knowledge about means. They claim to be leaders without having mastered the techniques of human progress. Their ignorance deprives them of authority.¹¹

More sympathetically, if not explicitly directed at the church, Keynes writes:

[Looking forward] I see us free ... to return to some of the most sure and certain principles of religion and traditional virtue—that avarice is a vice, that the exaction of usury is a misdemeanour, and the love of money is detestable, that those walk most truly in the paths of virtue and sane wisdom who take least thought for the morrow ... But beware! The time for all this is not yet. For at least another hundred years we must pretend to ourselves and to everyone that fair is foul and foul is fair; for foul is useful and fair is not. Avarice and usury and precaution must be our gods for a little longer still. For only they can lead us out of the tunnel of economic necessity into daylight.¹²

¹¹ Michael Novak, *The Spirit of Democratic Capitalism* (London: Institute of Economic Affairs, 1991), 336.

¹² John Maynard Keynes, "Economic Possibilities for Our Grandchildren," in *The Collected Writings of John Maynard Keynes*, vol. 9 (London: Macmillan for the Royal Economic Society, [1931] 1972), 330–1.

The task of transmuting human nature must not be confused with the task of managing it.¹³

Pope Francis does not claim expertise in economics for the church and *Laudato Si'* can be taken simply as a protest against injustice, giving voice to “the cry of the earth and the cry of the poor.” Yet the church’s insight into the human condition is more profound than the economists allow. The particular path the world has taken through history is the result of a myriad of individual decisions for good or ill. These decisions are certainly influenced by the market forces and general tendencies identified by economics, but are not determined by them. History is path-dependent; society is not recreated anew every day; decisions are always made within a context, yet they remain choices by moral agents. There can be no denying that the process of economic growth has brought both blessings and curses; it is a mixture of good and evil, as society itself. Human freedom means that the process could have been otherwise, even if the decisions of those with greater power do have more influence in shaping the future than those of others.

The lives of individuals are full of change and unwelcome necessities that are only partly the result of the wider economic forces at work, while shaped by the larger background. Even the movement of the rural population to the cities is usually a voluntary choice rather than the result of expropriation or eviction. Furthermore, the larger background contains social and political forces that cannot be reduced to the economic, most importantly war, disease, and natural disaster. Thus, it may not be so inconsistent to criticize the particular path that capitalist development has taken while accepting that such development is necessary and in the end desirable for society as a whole. We cannot know the path not taken, yet neither can the church accept that God requires evil to be done that good may come of it.

Looking forward from the present, the analysis of *Laudato Si'* does suggest some concrete principles for the reform of capitalism as it stands today, without which the system may destroy itself long before we “solve the economic problem” as Keynes hoped in his “Economic Possibilities for Our Grandchildren.” The fruitfulness of the document in this fashion suggests that its fundamental analysis of the human condition is sound, even if we cannot now discern how the past might have been different. In the next two sections, we consider two specific examples: how ecological conversion might extend to transnational corporations, and the imperative and implications of accepting that involuntary unemployment is generated by the market system and not by the individual.

Ecological conversion, the technocratic paradigm, and the transnational corporation

Although *Laudato Si'* is, as we have seen, critical of the historical path taken by capitalism, its main target is the technocratic paradigm characteristic of its present

¹³ John Maynard Keynes, “The General Theory of Employment, Interest and Money,” in *The Collected Writings of John Maynard Keynes*, vol. 7 (London: Macmillan for the Royal Economic Society, [1936] 1973), 374.

form. Technocracy manifests itself in both the public and the private sector and particularly with the emergence over the last fifty years of the large corporation as the dominant actor in the process of transnational production and distribution. The major lacuna in the arguments of Novak and his followers, for liberty against the tyranny of the state, is the failure to recognize the tyranny of the corporation and the capital market. There is no prospect of ecological conversion without reform of the purpose and governance of the corporation.

The modern corporation has permitted a new idolatry of money to emerge in the form of the primacy of shareholder value. Directors and shareholders alike believe the corporation exists to maximize the profits of the shareholders, measured not even by the earnings of the business but by the increase in its share price. The corporation has become a thing, a machine for generating shareholder value, that may be passed from hand to hand, if another set of shareholders believe they can run the machine more profitably.

Those employed by such a corporation are indeed treated as mere cogs in the machine. The alienation of workers from their labor has been perfected: the sole end and purpose of their work is shareholder value. Even customer service is purely instrumental; in today's call centers, outsourced workers in windowless offices are paid to process calls so as to maximize revenue under a service contract, monitored relentlessly by computers and instant mechanical customer surveys, and penalized if they spend too much time solving genuine customer problems. Even directors and senior management are caught in the machine and have lost their autonomy, constrained to follow the imperatives of the market for corporate control. Even those who manage the investment institutions that exercise this power over corporations are themselves ranked on quarterly performance against an index. Most of those who benefit from all this, in terms of retirement or superannuation funds, are completely unaware of the source of their retirement incomes.

Romano Guardini captures this helplessness and is under no illusion as to the true name of the idol:

A peculiar vacancy appears in the actor ... [who] no longer seems master of the act; instead the act seems to pass through him ... there is a growing sense of there being no-one at all who acts, only a dumb, intangible, invisible, indefinable something which derides questioning. Its functions seem to be necessary, so the individual submits to them. Seemingly incomprehensible, it is simply accepted as a mystery ... and as such draws to itself those sentiments, in distorted form, which a man is meant to reserve for his fate, not to say, God.¹⁴

It was not always this way, and it need not necessarily be so. The earliest corporations were monasteries and universities created by Papal or royal charter to allow the institutions to continue as their celibate members passed away. Long before the concept of limited liability was admitted for private companies, incorporation "into a body" created a legal person capable of holding property in perpetuity and acting in its

¹⁴ Romano Guardini, *The End of the Modern World* (London: Sheed and Ward, 1957), 125.

own name, distinct from its members. The modern corporation is truly nonhuman, a pure nonmaterial embodiment of power and technology, yet its origins lie in a human association, a community of persons.

This chapter has so far made little reference to nature beyond the role of fossil fuels in climate change. Although individual and institutional consumption decisions are of great importance, the greater impact on the natural environment comes from the processes of production and distribution, which themselves largely determine the forms of consumption. We cannot hope for an ecological conversion in this sphere without addressing the nature of human work and the goals of the enterprises through which work is undertaken.

Pope Francis writes, in the tradition of the church, of the necessity and dignity of human labor and its central part in the concept of an integral ecology. This contrasts with both the ancient association of work with servility and its modern association with disutility. He calls for a renewed understanding of the meaning of work and of the insight of St. Benedict, revolutionary in his time and of perennial value today, that we find in community:

Personal growth and sanctification came to be sought in the interplay of recollection and work. This way of experiencing work makes us more protective and respectful of the environment; it imbues our relationship to the world with a healthy sobriety ... We need to remember that men and women have “the capacity to improve their lot, to further their moral growth and to develop their spiritual endowments.” Work should be the setting for this rich personal growth, where many aspects of life enter into play: creativity, planning for the future, developing our talents, living out our values, relating to others, giving glory to God.¹⁵

Although some enlightened business leaders have attempted to establish such a culture within their enterprise, their experiences suggest that it is not possible for such a vision of work to be sustained without legal reform in the purpose and governance of corporate enterprise to dethrone the cult of shareholder primacy. Conversely, the basis of such reform has to be the recognition (once again) of the corporation as a community of enterprise, a vehicle through which human work is enabled and exercised in the service of the common good:

In fact, the purpose of a business firm is not simply to make a profit, but is to be found in its very existence as a community of persons who in various ways are endeavouring to satisfy their basic needs, and who form a particular group at the service of the whole of society.¹⁶

A business cannot be considered only as a “society of capital goods”; it is also a “society of persons” in which people participate in different ways and with specific responsibilities, whether they supply the necessary capital for the company’s activities or take part in such activities through their labor.¹⁷

¹⁵ Pope Francis, *Laudato Si'*, §126–7.

¹⁶ Pope John Paul II, *Centesimus Annus* (London: Catholic Truth Society, 1991), §35.

¹⁷ *Ibid.*, §43.

Without doubt, one of the greatest risks for businesses is that they are almost exclusively answerable to their investors, thereby limiting their social value ... In recent years a new cosmopolitan class of *managers* has emerged, who are often answerable only to the shareholders generally consisting of anonymous funds which *de facto* determine their remuneration.¹⁸

Many of the unacceptable aspects of corporate behavior are the result of viewing the corporation as a money-making machine rather than a community of human enterprise. Economists use the term “externality” to refer to costs imposed, but not paid for, by a firm. In the pursuit of shareholder value, businesses have externalized as many costs as possible. Some are transferred in the name of “convenience” to the consumer, who wanders around a large warehouse looking for goods before taking them to a robotic checkout. Other costs are transferred to workers through “flexible” contracts; only strictly necessary working time is paid for, with no room for breaks, meals, or even conversation, while workers are expected, on the one hand to be available 24/7, and on the other hand to travel long distances at their own expense to work, sometimes for less than a full day. Secure, defined benefit pension schemes have been closed, and the risk of investment in provision for old age transferred wholly to the worker and the state.

Pope Francis’s main concern in *Laudato Si’* is with the environmental externalities: the “immense pile of filth” arising from our failure to adopt a circular model of production.¹⁹ This is what he means when he writes that “businesses profit by calculating and paying only a fraction of the costs involved”—not that all profit comes at the expense of others. “Only when ‘the economic and social costs of using up shared environmental resources are recognized with transparency and fully borne by those who incur them, not by other peoples or future generations,’ can those actions be considered ethical.”²⁰

Yet “the mindset which leaves no room for sincere concern for the environment is the same mindset which lacks concern for the inclusion of the most vulnerable members of society.”²¹ The pursuit of shareholder value leaves no space, no breathing room, for people to take into account the interests of other people—especially so-called losers—and the planet, unless this can be turned to profit. There is simply no room for gratuitousness.²² This is not to deny that individuals are independently capable of greed and cruelty; it is the institutionalization of those values under other names over a long period that is the issue. People are equally more than capable of responding to a positive business culture that *genuinely* values customers and co-workers, the community and the environment, rather than using transparent rhetoric to harness those impulses instrumentally.

Business leaders have to be set free to pursue “a noble vocation, directed to producing wealth and improving our world,” rather than maximum shareholder

¹⁸ Pope Benedict XVI, *Caritas in Veritate*, §71.

¹⁹ Pope Francis, *Laudato Si’*, §21–2.

²⁰ *Ibid.*, §51.

²¹ *Ibid.*, §196.

²² Pope Benedict XVI, *Caritas in Veritate*, §34.

value.²³ This is not the place to set out in detail the argument for the necessary legal changes. They include as a minimum a clear distinction between the corporation as a legal construct and the one or more enterprises it operates; a recognition of the natural right of membership of workers in the corporation that employs them; a duty of directors to pursue the success of the enterprise for which they are responsible, in the interests of all the members (shareholders *and* workers) and the common good; the prohibition of the hostile takeover and the consent of workers to takeovers recommended by the directors; and parent company liability for subsidiaries to ensure that responsibilities to stakeholders cannot be shirked by hiding behind a corporate veil. Without changes along these lines, there is no prospect of corporations not only adopting—but sometimes happens—but *sustaining* a wider purpose than the pursuit of shareholder value and operating in the interests of the common good.

The nature of unemployment and its remedies

The rules of capitalism limit the obligations of individuals and corporations to each other. Even the most enlightened enterprise is not expected to take into account the adverse effects of its operations on its competitors. Employment is never perfectly secure against competition from new technology, unless indeed such competition is prohibited. Yet without the spur of competition, it is easy for incumbents to stagnate and neglect opportunities for innovation within their existing businesses. Managers may prefer an easy life to the challenges of responding to change in the needs of society; workers may refuse to change their working practices or demand unreasonable compensation for doing so.

One of the most serious deficiencies of mainstream economics is its minimization of the implications of competition for workers and their families. The standard theory presents workers as making a trade-off between leisure and labor, choosing to work for money only if, and to the extent that, the attractions or utility they derive from material goods offsets those from pursuing leisure activities. The implication is that labor is always fully employed; any observed “unemployment” reflects a choice to engage in job-seeking. Modern job search and matching models implicitly assume that “you can always flip burgers”; if people spend time between jobs, it is because they are looking for a better match to their skills and experience and the accordingly higher income than the basic unskilled jobs that are always (it is asserted) immediately available. Workers are assumed to have an “outside option,” supported by past savings, other members of the household or off-market subsistence agriculture, if not unemployment benefit. If this alternative is too generous, unemployment will be higher, hence the prescription of benefit cuts to reduce unemployment.

In this “Classical” model, unemployment is always a matter of the labor market, either of individual preferences as given earlier or of some interference with competition that prevents the market wage settling at a level that matches the demand of employers for workers and the demand of workers for jobs. Such interferences include trade unions,

²³ Pope Francis, *Laudato Si'*, §129.

employment protection laws, and minimum wages. Although often well intentioned, such institutions create unemployment by reducing the incentives to take or offer employment, so it is argued. It was against this model that Keynes wrote:

The characteristics of the special case assumed by the Classical theory happen not to be those of the economic society in which we actually live, with the result that its teaching is misleading and disastrous if we attempt to apply it to the facts of experience.²⁴

In Keynes's theory of the market economy, the level of employment is ultimately determined by spending decisions, of which the most crucial is spending on new physical capital. In Classical theory, as described earlier, the natural state of the economy is full employment and any unemployment is a matter of the preferences or deficiencies of workers or of imperfections in the labor market. In Keynesian theory, there is no natural tendency to full employment and unemployment is, in great part, a symptom of failure at the level of the system as a whole.

Our concern here is not with economic theory, let alone with the continuing dispute within the profession over whether Keynes was scientifically correct. The point is that there is a substantial body of economic thought arguing that unemployment is not usually the fault of the worker, but of the rules of the capitalist system. If we recognize the benefits to society of economic growth through Schumpeterian creative destruction, Keynes's analysis implies that we must also accept responsibility for the consequent unemployment and not simply blame the unemployed; this is broadly also the position of the church.

Since 2010, the UK has experienced an unprecedented assault on the dignity of the unemployed, including both the active job-seekers and the incapacitated. Driven by a political agenda to reduce public spending and taxation, supported by hateful rhetoric of "strivers and skivers," its legitimacy derives from the Classical theory: the experience of unemployment must be made unpleasant and humiliating if people are to take whatever jobs are available. Superficially, the policy can be claimed to have succeeded, since the unemployment rate (5 percent in 2016) has returned to the pre-2008 level, even if this compares unfavorably with the 2 percent of the 1960s and represents 1.6 million individual people unemployed. However, the reduction in the unemployment rate has been associated with a growth in low-skilled employment and low productivity growth. With university graduates working in bars or as care workers, unemployment has been transformed into underemployment, since holding out for a better job leads to withdrawal of benefits.

The UK has increasingly followed the US model of weak employment protection ("labor market flexibility"), low benefits, and little or no help with redeployment. The Scandinavian countries offer a refreshing contrast, combining high flexibility with high benefits (68 percent of average previous income in Denmark—90 percent for those on lower incomes—compared with 28 percent in the UK and United States, providing much greater income security for families) and an active policy of retraining

²⁴ Keynes, "The General Theory of Employment," 3.

or work placements. This “flexicurity” model continues to perform well despite the high unemployment created by the 2008 crash.²⁵

Denmark’s experience confirms that unemployment is mainly not a matter of individual preferences or deficiencies. There is no need to punish the unemployed for their misfortune, but it costs money to help them constructively. This is ultimately an ethical and political choice about the distribution of the surplus generated by economic growth. Denmark operates on a consensus that society as a whole has a responsibility to help the unemployed through the state, while the creation of new jobs is mainly left to capitalist enterprise.

A different, explicitly Catholic, approach internalizes the responsibilities of both job creation and redeployment within the corporation. Sixty years ago, a parish priest encouraged five students at the technical school he had founded to set up a business on the principles of Catholic Social Thought, as a corporation in which the members are the workers and capital is subordinated to labor. The workers are required to invest a substantial capital sum (now about €15,000, paid by instalments) and their wages are considered advances against their share of profits; 60 percent of net profits are placed in a common reserve and 10 percent allocated to the community. Workers receive a maximum return on their capital account of 7.5 percent per annum. There is an elaborate system of industrial democracy, based on one member one vote and a maximum pay differential of 6:1. They created a bank through which the local community financed their industrial investment in the early stages before the businesses became self-financing; a social security, healthcare, and pension fund for their members and families; and a full range of educational and research institutions from primary school to university, open to the community, as well as industrial research centers.

The Mondragon Corporation of the Basque region of Spain now embodies 74,000 people worldwide, including one of Spain’s largest supermarket chains (Eroski), as a confederation of 101 autonomous cooperatives with total sales of €11 billion. Mondragon’s industrial products include machine tools, aerospace and automotive components, construction and elevators, household durables, and medical equipment. One of its key strategic areas for development is “Energy, Sustainability and Smart Cities.” The bank (Laboral Kutxa) remains worker-owned but is now a freestanding financial services business with total assets of €21 billion.

From the outset at Mondragon, there has been a commitment to technological progress and competitiveness in the global market, and to professional management within a structure based on subsidiarity. While the overall objective is to create good employment, this can only be done by providing competitive goods and services and through continuous investment in innovation, to create employment in new sectors as older ones become obsolete. It also requires financial discipline to address loss-making sectors. The hardest test of a cooperative enterprise is its response to economic crisis, whether global or in particular sectors. During the 1970s oil crisis, Mondragon maintained employment by accepting lower incomes in order to maintain competitive

²⁵ Torben Andersen, “A Flexicurity Labor Market in the Great Recession: The Case of Denmark,” *De Economist* 160 (2012): 117–40.

prices and switching workers between businesses. More recently, in 2013 the original 1956 cooperative was closed with the loss of 1,900 jobs and a write-off of €300 million invested by the other cooperatives in an attempt to secure its future. Within a year, 90 percent of workers had been redeployed to other cooperatives or had taken early retirement. The remainder receive unemployment insurance from the social security fund while the group continues to seek a permanent solution for them.

Although the Mondragon cooperative group is generally much admired across the world, there has been little successful emulation so far.²⁶ The importance of its roots in Catholic Social Thought is generally overlooked or downplayed; Mondragon itself prefers to speak publicly of values rather than faith (its strapline is “Humanity at Work”), yet has by no means distanced itself from its roots. Mondragon offers what appears a paradoxical mixture: of solidarity with individual profit and responsibility; of community and competitiveness; of private and common ownership; of the subordination of capital in the service of labor and of the authority of professional management; of commitment to a particular region with worldwide manufacturing and distribution; of traditional values and leading-edge technology.

Mondragon may be considered a (relatively) pure application of Catholic Social Thought to the questions raised by economic growth, particularly the insecurity and unemployment created by the process of creative destruction. Yet it is not a model that can be imposed. The contrast between the UK and Denmark illustrates that larger societies do also have real choices in how they respond to the human costs of economic growth.

Conclusion

For economic growth—the growth of income per head—to take place, society must generate a surplus and invest this in new technology, creating profitable new goods and occupations while others become obsolete. Historically, economic growth has come about through a process of creative destruction, by which enterprising innovators are free to compete without regard to the adverse consequences for established producers. Even if society’s consequent higher income leads to higher total employment, the insecurity and redundancy created by competition create hardship for workers and their families. Furthermore, as the capitalist mindset takes hold, it is often easier to make profit, not through innovation, but at the expense of workers, the community, and the environment, by externalizing part of the true costs of production. An ethical producer, who recognizes these true costs, can easily be undercut by a less scrupulous competitor. Conversely, the consumer cannot usually distinguish whether a product is of better value because of superior technology or because of inferior working conditions and environmental degradation.

Society can and must change, if humanity is to survive climate change, but the necessary change demands a conversion that recognizes the integral ecology we

²⁶ Mondragon is not without critics; see Sharryn Kasmir, *The Myth of Mondragón: Cooperatives, Politics and Working-Class Life in a Basque Town* (Albany: State University of New York Press, 1996).

inhabit. It is possible that the pace of economic growth will slow if its true costs to the Earth and the poor are internalized by business. The external costs of fossil-fuel energy are beginning to be accepted. Some change can be achieved at the social level through legislation: a panoply of environmental regulations and taxes awaits the political will for their implementation; corporations must be reformed to dethrone the idol of shareholder value; the consequences of creative destruction for families can be mitigated by a more enlightened attitude toward unemployment and a more equitable sharing of the costs of economic growth through more generous and constructive forms of unemployment support. A deeper conversion could see more corporations along the lines of Mondragon. The power of that model is the internalization of both technical progress and redeployment of labor from old to new sectors, yet it requires a degree of personal commitment and solidarity rarely encountered.

As Pope Francis writes, once again quoting Guardini: “This task ‘will make such tremendous demands of man that he could never achieve it by individual initiative or even by the united effort of men bred in an individualistic way. The work of dominating the world calls for a union of skills and a unity of achievement that can only grow from quite a different attitude.’”²⁷

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²⁷ Pope Francis, *Laudato Si'*, §219.

“No Compromise in Defense of Mother Earth”: The Religion and Politics of Radical Environmentalism

Kyle William Beam

The very mention of “radical environmentalism” is likely to conjure up images of burning ski resorts and housing developments, clandestine raids on research laboratories, and black-clad saboteurs prowling amid construction equipment by night. However, while this willingness to employ illegal tactics has certainly received the greatest amount of media and scholarly attention,¹ it would be a mistake to conclude that this is the only feature that differentiates radical environmentalism from the mainstream environmental movement. Although radical environmental groups such as Earth First!, the Sea Shepherd Conservation Society, the Earth Liberation Front (ELF), and the Animal Liberation Front (ALF) differ significantly in their priorities and tactics, the basis for their activism ultimately can be reduced to two broad principles: a reverence for the totality and integrity of life on Earth, extending from individual organisms to ecosystems and the natural processes that give them being; and an attendant commitment to defend ecological integrity by any means necessary. This outlook might be most aptly described as “militant ecocentrism.”

While most inquiries into the intellectual sources of radical environmentalism emphasize the scientific or philosophical influences upon their activism, few focus upon its religious dimensions.² This chapter will demonstrate that the movement’s

¹ For a few of the most prominent, see Ron Arnold, *Ecoterror: The Violent Agenda to Save Nature: The World of the Unabomber* (Bellevue, WA: Merrill Press, 1997); Don Liddick, *Eco-Terrorism: Radical Environmental and Animal Liberation Movements* (Westport, CT: Praeger Publishers, 2006); Gary Ackerman, “Beyond Arson? A Threat Assessment of the Earth Liberation Front,” *Terrorism and Political Violence* 15.4 (2003): 143–70; Paul Joosse, “Leaderless Resistance and Ideological Inclusion: The Case of the Earth Liberation Front,” *Terrorism and Political Violence* 19.3 (2007): 351–68; Paul Joosse, “Elves, Environmentalism, and ‘Eco-Terror’: Leaderless Resistance and Media Coverage of the Earth Liberation Front,” *Crime Media Culture* 8.1 (2012): 75–93; Sue-Ming Yang, Yi-Yuan Su, and Jennifer Viarriale Carson, “Eco-Terrorism and the Corresponding Legislative Efforts to Intervene and Prevent Future Attacks,” *Canadian Network for Research on Terrorism, Security, and Society (TSAS) Working Paper Series*, no. 14–04 (May 2004): 6–88.

² The ethnographic fieldwork of Bron Taylor, to whom this study is heavily indebted, is a notable exception. His most important publications include: “Diggers, Wolves, Ents, Elves and Expanding Universes: Global Bricolage and the Question of Violence within the Subcultures of Radical

militant commitment to effective direct action in defense of the Earth is in fact a direct outgrowth of its particularly religious understanding of ecocentrism, which perceives the Earth as sacred and worthy of defense. Moreover, this overtly spiritual orientation can be understood as a late twentieth-century revival of the strongly religious ethos of the nineteenth-century wilderness preservation movement, attracting a new generation of amateur activists in a time when the mainstream environmental movement began to adopt a more professionalized, bureaucratic, and anthropocentric focus.³

The religious foundations of radical environmentalism

The guiding principle of radical environmentalism is *ecocentrism*, which accords value to the totality of the ecosphere, from living organisms to apparently inanimate or abstract entities such as rivers, mountains, forests, ecosystems, and species. According to Robyn Eckersley, the ecocentric outlook differs from the dominant paradigm of modernity in its rejection of anthropocentrism, which ascribes value and meaning to humanity alone and views the natural world in primarily instrumental terms.⁴ In other words, humans are not the crown of creation, the “paragon of animals,” the pinnacle of earthly evolution, or even all that important from an ecological or cosmic perspective. Controversially, for the founders of Earth First! this ecocentrism entailed “a placing of the Earth first in all decisions, even ahead of human welfare if necessary.”⁵ Despite the shifting priorities within radical environmentalism over the years, from wilderness and wildlife preservation to a greater concern for social justice and revolutionary political change, journalist Rik Scarce could still declare in 2006 that “ecocentrism is what this movement is about, not narrow human concerns.”⁶

In attempting to discern the intellectual foundations of these ecocentric attitudes, scholars typically trace them to two main sources: a scientific understanding of interdependence and natural limits derived from ecology and conservation biology, and the principle of “biospheric egalitarianism” and identification with the natural

Environmentalism,” in *The Cultic Milieu: Oppositional Subcultures in an Age of Globalization*, (eds.) Jeffrey Kaplan and Heléne Lööw (Walnut Creek: AltaMira Press, 2002), 26–74; “The Tributaries of Radical Environmentalism,” *Journal for the Study of Radicalism* 2.1 (2008): 27–61; “Religion, Violence and Radical Environmentalism: From Earth First! to the Unabomber to the Earth Liberation Front,” *Terrorism and Political Violence* 10.4 (1998): 1–42; “Earth First!’s Religious Radicalism,” in *Ecological Prospects: Scientific, Religious, and Aesthetic Perspectives*, (ed.) Christopher Key Chapple (SUNY Press: Albany, 1994), 185–210; and “Ecological Resistance Movements; Not Always Deep but if Deep, Religious: Reply to Devall,” *Trumpeter* 13.2 (1996): 98–103.

³ This chapter draws heavily on the author’s unpublished dissertation, *Future Primitive: The Politics of Militant Ecology* (July 2016), which traced the scientific, metaphysical, religious, and anthropological principles informing radical environmental activism and compared them with other schools of contemporary green political thought. This chapter focuses more specifically on the religious dimensions of radical environmental activism, its historical antecedents in the nineteenth-century wilderness preservation movement, and its decisive role in motivating the political militancy of activists.

⁴ Robyn Eckersley, *Environmentalism and Political Theory: Toward an Ecocentric Approach* (Albany: State University of New York Press, 1992), 28.

⁵ Dave Foreman, *Confessions of an Eco-Warrior* (New York: Crown Trade Paperbacks, 1991), 26.

⁶ Rik Scarce, “A Quarter Century of Deviance,” *Earth First! Journal* 26.1 (2006): 50.

world associated with Arne Naess's philosophy of deep ecology.⁷ However, while the influence of deep ecology upon the movement is undeniable, and while the movement is indeed strongly informed by these contemporary scientific currents, these scientific and philosophical influences only constitute one dimension of the radical environmental worldview—and not the most important one. Even when articulating their outlook in terms of specific scientific or philosophical theories, many radical environmentalists insist that the ultimate basis for their activism must be sought in a more transcendent principle. Writing in the *Earth First! Journal*, one activist bemoans the fact that “the wilderness movement has now lost much of its spiritual underpinnings and relies heavily on the data and blessings of certain branches of the scientific community,” which has transformed the environmental debate into a contest between conservation scientists and industry scientists.⁸ The ultimate foundation for ecodefense must therefore be a religious conviction that the Earth and its life are sacred and possess an inherent value, independent of human utility. As Ayalet Hines counsels her fellow Earth First! activists, “If you also feel that the earth is a holy creation and eternally precious, warranting our deference, put aside the technocratic and scientific theories upon which so much of the environmental movement relies, and focus awhile on the spiritual and ethical issues at the root of the crisis at hand.”⁹ If anything, these scientific and philosophical theories have only served as fodder for their fundamentally religious view of the struggle: as Jesse Wolf Hardin explains in the *Earth First! Journal*,

This Earthen spirituality draws from the perspectives and vocabularies of deep ecology and bioregionalism, Sheldrake's new science and morphic resonance, pantheism and neoprimitivism, Taoism and Zen Buddhism, ecofeminism and pan-tribal shamanic practice, European and AmerIndian world-views, and the veneration of the living Earth from the Dark Mother of Africa to the disturbingly conscious Gaia of Lovelock's wildest dreams.¹⁰

Thus, the foundation of ecocentrism among radical environmentalists is an ultimately religious perception of the Earth as sacred and worthy of reverence, and therefore goes far deeper than any science or philosophy possibly can.

In addition, while radical activists draw upon a variety of scientific and philosophical theories, their impetus for activism almost invariably begins with direct spiritual experience of the natural world: as Hardin asserts, “The primary formative influence and motivating force behind Earthen Spirituality remains the personal, subjective experiences of its adherents.”¹¹ The central feature of this earthen spirituality is a direct

⁷ For a representative sample, see Martha Lee, *Earth First!: Environmental Apocalypse* (Syracuse: Syracuse University Press, 1995); Luc Ferry, *The New Ecological Order* (Chicago: University of Chicago Press, 1995); Derek Wall, *Earth First! and the Anti-Roads Movement: Radical Environmentalism and Comparative Social Movements* (New York: Routledge, 2002); Douglas Long, *Ecoterrorism* (New York: Facts on File, 2004); Rik Scarce, *Eco-Warriors: Understanding the Radical Environmental Movement* (Walnut Creek, CA: Left Coast Press, 2006).

⁸ Gene Therapy, “In Defense of Eco-Spirituality,” *Earth First! Journal* 16.3 (1996): 25.

⁹ Ayalet Hines, “Renewing the Soul of the Environment,” *Earth First! Journal* 17.2 (1997): 3.

¹⁰ Jesse Wolf Hardin, “ReWilding: Earth Tribe Religion,” *Earth First! Journal* 15.6 (1995): 25.

¹¹ Hardin, “ReWilding,” 25.

perception of the natural world as sacred, imbued with intrinsic value, and worthy of reverence. As prominent activist Rod Coronado writes, “All life is sacred. Everything on this earth is a creation of god and should be cherished and appreciated ... what I attempt to live is a life where the circle of respect and reverence is extended to all of god’s creation.”¹² Another feature of ecocentric religion is its recognition of the interconnectedness and kinship of all life. This intuition constitutes the foundation for the “Council of All Beings” created by John Seed and Joanna Macy, a popular ritual at Earth First! gatherings that aims to help humans overcome their alienation from the Earth by experiencing their connection with other forms of life.¹³ Altogether, these beliefs serve to encourage humility and a rejection of anthropocentrism, since humans are only one part (and not a particularly important one) of the greater whole. As Earth First! activist Stephanie Mills writes,

Becoming vulnerable to and tender toward the planet’s heartbreaking and beautiful truths of death, transformation, and regeneration; and of evolution’s teaching of the inconsequence of the individual relative to the species, is a soul-cracking experience. Absolute compassion with Mother Earth—suffering her pangs of creation and destruction—demands inordinate strength of spirit, a strength nurtured by a sense of one’s interpenetration with wild nature, a sense most often renewed in the very wilderness whose defense is being mounted.¹⁴

It is only by recognizing nature as a higher spiritual authority and working to shed their anthropocentric attachments that humans can become open to the wisdom of nature and understand their place in the greater whole.

While radical environmentalists embrace a number of religious traditions—the most popular being American Indian spirituality, Taoism, Buddhism, and neo-paganism¹⁵—a spiritual attitude prevails even among activists who reject organized religion. Earth First! cofounder Dave Foreman once described himself as a “howling-at-the-moon pantheist” who held his “personal religious views toward Mother Earth just as strongly and sincerely as any Christian.” As he told Bron Taylor in 1993, “I think that something that we need to work on is a nonsupernatural concept of the sacred. A nontheistic basis of sacred. When I say I’m a nontheistic pantheist, it’s a recognition that what’s really important is the flow of life, the process of life ... And so I guess what is sacred is what’s in harmony with that flow.”¹⁶ Likewise, Sea Shepherd founder Paul Watson, while critical of anthropocentric religious traditions and their “monkey gods,” has advocated a biocentric religion that “incorporates all species and establishes nature as sacred and deserving of respect.”¹⁷ By imbuing nature with spiritual significance,

¹² Quoted in Dean Kuipers, *Operation Bite Back: Rod Coronado’s War to Save American Wilderness* (New York: Bloomsbury, 2009), 255.

¹³ See Pat Fleming and Joanna Macy, “The Council of All Beings,” in *Deep Ecology Movement*, (eds.) Alan Drengson and Yuichi Inoue (Berkeley: North Atlantic Books, 1995), 226–36.

¹⁴ Stephanie Mills, “Thoughts from the Round River Rendezvous,” in *The Earth First! Reader: Ten Years of Radical Environmentalism*, (ed.) John Davis (Layton, UT: Gibbs Smith, 1991), 166.

¹⁵ Taylor, “Diggers, Wolves, Ents, Elves and Expanding Universes,” 48.

¹⁶ Taylor, “The Tributaries of Radical Environmentalism,” 43.

¹⁷ Paul Watson, “Biocentric Religion—A Call For,” in *Encyclopedia of Religion and Nature*, (ed.) Bron Taylor (New York: Continuum, 2005), 176–9.

these beliefs represent a form of religiosity, albeit of a less orthodox kind. As Foreman claimed of his fellow activists, "All of us are religious, even atheists like Howie Wolke who deifies grizzly bears and hopes to become one."¹⁸

Thus, in terms of understanding its historical development and continuing concerns, it is difficult to disagree with Bron Taylor's assessment that "radical environmentalism is best understood as a new religious movement that views environmental degradation as an assault on a sacred, natural world," and that understanding the movement's ethics and politics therefore requires a clear perception of its spiritual underpinnings.¹⁹ Indeed, Taylor claims that, in field research conducted since 1990, he has yet "to find an active participant in Earth First! who is not animated by one form or another, one experience or another, of what can fairly be labelled 'nature mysticism.'"²⁰ However, as the following will demonstrate, the religious underpinnings of this movement may not be so very new at all. They are most accurately understood, in fact, as a revival of the strongly religious ethos of the nineteenth-century wild preservation movement in the late twentieth century, a grassroots response to the increasing moderation and professionalization of mainstream environmentalism.

The militancy of radical environmentalism

These broadly ecocentric attitudes and propensity toward nature mysticism are not, of course, the exclusive domain of radical environmentalists. What most distinguishes radical environmentalism from these other forms of environmental philosophy and activism is its particularly *militant* brand of ecocentrism, its commitment to effective direct action that goes so far as to embrace illegal and possibly violent tactics in pursuit of ecological aims. This union of religious ecocentrism and militancy is succinctly captured by the well-known Earth First! slogan, "No Compromise in Defense of Mother Earth." Given that the cosmos is a living and interconnected whole, that the natural world is sacred and possesses an inherent worth of its own, and that humankind has radically overstepped its bounds in asserting control over the rest of life on Earth, radical environmentalists perceive a responsibility to "show the enemy that we are serious about defending what is sacred," as one early ELF communiqué declares.²¹ Thus, as activist Peggy Sue McRae points out, radical environmentalists are united both by a recognition that "nature is sacred and that we are a part of it" and by a willingness to "take responsibility for defending the biotic community."²²

This militancy therefore flows directly from their religious perception of the natural world, which inspires a commitment to uphold the laws of nature against the merely human laws of the state. Speaking for many radical environmentalists, Sea Shepherd

¹⁸ Dave Foreman, "Around the Campfire," *Earth First! Journal* 2.7 (1982): 21.

¹⁹ Taylor, "Religion, Violence and Radical Environmentalism," 2; Taylor, "Earth First's Religious Radicalism," 185.

²⁰ Taylor, "Ecological Resistance Movements," 102.

²¹ Quoted in Leslie James Pickering, *The Earth Liberation Front 1997–2002* (Portland, OR: Arissa Media Group, 2007), 10.

²² Peggy Sue McRae, "The Pagan Spirit in the Earth First! Movement," *Earth First! Journal* 21.1 (2000): 74.

founder Paul Watson once declared that “it is my duty as a citizen of the Earth to uphold the sacred trust of the Earth and obey her laws ... Natural law is supreme.”²³ Although this “natural law” (or what may be more properly identified as the “law of nature” in order to distinguish it from earlier traditions of natural law theory) consists, in part, of physical and ecological restraints to human activity, for radical environmentalists it goes beyond these purely physical limitations. It also entails a sacred duty to defend the integrity and flourishing of life on Earth by any means necessary, even when doing so might violate the laws of the state: as Rod Coronado writes, “At a time when ecological and cultural destruction is commonplace within the perimeter of the law, it becomes necessary to adhere to the higher laws of nature and morality.”²⁴ Although in an ideal world human laws and the laws of nature would be complementary, Paul Watson admits that such is not the case today, and that conservationists have a duty to obey the latter over the former: “I respect the laws of a nation-state only to the extent that such laws respect the higher order ... Our birthright as natural creatures and as citizens of the Earth gives us that right. It is our right to uphold and to defend the laws of nature.”²⁵ It is clear that many radical environmentalists base their activism upon the recognition of a spiritual higher law in nature, as an object of reverence that demands defense.

This sense of attunement with the natural order does not only impose a moral duty upon activists to obey the law of nature; it also gives them the strength to overcome their fears and take direct action on behalf of the Earth. By shedding their anthropocentric attachments and recognizing nature as a higher authority, by “becoming a part of the wild,” Foreman claims, activists can recover a “courage far greater than ourselves, a union that gives us boldness to stand against hostile humanism, against the machine, against the dollar, against jail, against extinction for what is sacred and right; the Great Dance of Life.”²⁶ A famous example of this self-overcoming is offered by Julia “Butterfly” Hill, who famously lived atop a threatened California Redwood for 738 days between 1998 and 1999. After experiencing a violent storm from atop her 180-foot perch, she realized that “by letting go of all attachments, including my attachment to self, people no longer had any power over me ... I was no longer going to live my life out of fear, the way too many people do, jolted by our disconnected society. I was going to live my life guided from the higher source, the Creation source.”²⁷ It is, indeed, this sense of attunement to the natural order and spiritual commitment to defend the Earth that galvanizes radical environmentalists to action, even when resistance seems hopeless. Jonathan Paul, an activist affiliated with the ELF and ALF, claims that “no matter what the outcome or the reality of what looms ahead, I am grateful and honored to be one who fights against the darkness. Even if I were told we would lose the fight to save this planet, I would not give up.”²⁸ Drawing an explicit connection to

²³ Paul Watson, “On the Precedence of Natural Law,” *Environmental Law and Litigation* 3 (1988): 79.

²⁴ Rod Coronado, “Spread Your Love through Action: An Open Letter from Rod Coronado,” *Earth First! Journal* 15.4 (1995): 8.

²⁵ Watson, “On the Precedence of Natural Law,” 86.

²⁶ Foreman, *Confessions of an Eco-Warrior*, vii, 9.

²⁷ Julia Butterfly Hill, *The Legacy of Luna: The Story of a Tree, a Woman, and the Struggle to Save the Redwoods* (San Francisco: Harper San Francisco, 2000), 114–15.

²⁸ Jonathan Paul, “The Beginning of the End,” in *This Country Must Change: Essays on the Necessity of Revolution in the USA*, (ed.) Craig Rosebraugh (Portland, OR: Arissa Media Group, 2009), 136.

the grim ethos of the ancient Norsemen, Tom Stoddard likewise muses that “the forces for conservation seem analogous to the virtuous gods of the ancient Viking religion who live in Valhalla and fight heroically against the forces of evil, but are ultimately overwhelmed and fall in defeat. I do not see any way conservationists will win; the forces of doom and evil are too powerful. We must continue to fight anyway.”²⁹ Clearly, many radical environmentalists are motivated by an ideal of sacred duty or love for the Earth, rather than the likelihood of success.

It is also this religiously motivated willingness to defend the sacred by any means necessary that drives activists to embrace illegal tactics, ranging from civil disobedience to sabotage to even, in some cases, violence. Given that the core of radical environmentalism is militant ecocentrism, which emphasizes defending the sacred natural world by any means necessary, activists often insist on the importance of “using whatever tools and tactics that are effective in saving natural diversity,”³⁰ arguing that “only the successful weaving of multiple strategies will lead to success.”³¹ Radical environmentalism therefore refuses to categorically disavow any potentially effective tactic, any means that might be necessary in the defense of the sacred Earth.

For this reason, few within the movement express any compunctions about property destruction if the property is being used to harm the biosphere. Paul Watson, while believing that “violence is morally wrong and nonviolence is morally right,” nevertheless admits that “few changes on this planet have taken place solely because of nonviolent action. To remain nonviolent totally is to allow the perpetuation of violence against people, animals, and the environment.”³² Foreman also, though rejecting physical violence against living beings, argued that acts of property destruction are morally justified by a right of “self-defense” (when one fully identifies with the spirit of wild place) as well as a “biophilic” impetus to defend the sacred Earth “against those who would destroy her for their *short-term profit* and *power thrills*.”³³ He concludes that “it boils down to the question of whether private property (and the dollars or jobs the property represents) or natural ecosystems are more valuable ... Life—the biological diversity of this planet—is far more important.”³⁴

The widespread ecocentric belief that all life is sacred, as well as more plainly strategic considerations, has generally worked to discourage violence against humans in the movement. Nevertheless, a recurrent question among scholars and analysts is whether or not this ecocentric ideology might ever condone such violence in pursuit of ecological aims. Bruce Ackerman notes some features common among activists that might lend themselves to an escalation in violent tactics: their tendency to demonize

²⁹ Tom Stoddard, “Islands to Islands to Dust,” *Earth First! Journal* 7.3 (1987): 22.

³⁰ Chim Blea/Dave Foreman, “Cat Tracks: What Are We Fighting For?” *Earth First! Journal* 4.2 (1983): 17.

³¹ Jeff Luers, “Weaving Multiple Strategies for Success,” in *This Country Must Change: Essays on the Necessity of Revolution in the USA*, (ed.) Craig Rosebraugh (Portland, OR: Arissa Media Group, 2009), 52.

³² Paul Watson and Warren Rogers, from “Sea Shepherd, My Fight for the Whales and Seals,” in *Radical Environmentalism: Philosophy and Tactics*, (ed.) Peter List (Belmont, CA: Wadsworth Publishing Co., 1993), 171, 167.

³³ Dave Foreman, “Violence and Earth First!,” *Earth First! Journal* 2.4 (1982): 4.

³⁴ Foreman, *Confessions of an Eco-Warrior*, 139–43, 121.

opponents, their penchant for bellicose statements, their rejection of the legitimacy of the state, the large proportion of young, male members among their ranks, and their perception of the natural world as sacred and imperiled by human greed.³⁵ Given the strongly religious foundations of their ethic, it is not inconceivable that some activists could come to view themselves as holy warriors fighting in defense of the Earth against a sinful or degenerate humankind, and adopt violence as a necessary means to that end. Whether or not it comes to pass, it is clear that even the most violent manifestations of radical environmental activism can be understood as an expression of its fundamentally religious ethos.

Radical environmentalism as religious revival

While the tactics of radical environmentalism are quite unique in the history of ecological activism, its strongly spiritual ethos is not really so new after all. Although often explicitly rejecting Christianity³⁶ and embracing American Indian, Asian, or neo-pagan religious practices, the spirituality of radical environmentalism nevertheless betrays certain parallels to America's old-time Calvinist religion, a feature that it inherited from the nineteenth-century wilderness preservation movement. These parallels include a fixation on the "fall of man" from a state of primordial purity, distrust of modern urban-industrial civilization, condemnation of greed, and an apocalyptic view of environmental catastrophe.³⁷ Indeed, the Transcendentalist nature writing that inspired many in the early wilderness preservation movement has been aptly described as "reminiscent Puritanism" thinly disguised as philosophy.³⁸ This is particularly true of the post-Calvinist nature mysticism of Henry David Thoreau and John Muir, which promoted an esthetic spirituality that inspired its adherents to "see beyond instrumental values, to find beauty in the unaltered Creation, and to identify that beauty with goodness and truth."³⁹ Nor is the line linking radical environmentalism to Calvinism, by way of the early wilderness preservation movement, a purely thematic one. Among the many environmental leaders raised in the Presbyterian afterglows of the Calvinist faith (including John Muir, Rachel Carson, David Brower, and Edward Abbey) can be counted Earth First! cofounder and ecowarrior *par excellence* Dave Foreman.⁴⁰

³⁵ Ackerman, "Beyond Arson?" 145–9.

³⁶ Christianity is one of the least popular forms of religious observance among militant ecologists, with the explicitly anti-Christian sentiments of many activists actually driving away potential members (Taylor, "Earth First!'s Religious Radicalism," 188–93). Specifically, radical environmentalists often regard the Christian religion as hopelessly anthropocentric, life-denying, otherworldly, and chiefly responsible for the present ecological crisis as well as the extirpation of indigenous cultures throughout the Americas.

³⁷ Robert Nelson, *The New Holy Wars: Economic Religion vs. Environmental Religion in Contemporary America* (University Park, PA: Pennsylvania State University Press, 2010), 114, 106.

³⁸ Stephen Fincher, quoted in David Williams, *Wilderness Lost: The Religious Origins of the American Mind* (London: Associated University Press, 1987), 150.

³⁹ Donald Worster, *The Wealth of Nature: Environmental History and the Ecological Imagination* (New York: Oxford University Press, 1993), 199, 201.

⁴⁰ Dave Foreman, *Take Back Conservation* (Durango, CO: Raven's Eye Press, 2012), 304.

These direct links explain a few features of radical environmentalism—particularly its suspicion of progress, dim view of human nature, and overriding emphasis on wilderness preservation—that continue to distinguish it from the mainstream environmental movement. It is notable that the founders of many radical environmental organizations, including Dave Foreman, Howie Wolke, and Bart Koehler of Earth First! as well as Paul Watson of the Sea Shepherd, were themselves exiles from more moderate organizations such as the Wilderness Society, the Sierra Club, and Greenpeace. These early radical environmentalists were driven to extremism out of frustration with the moderation of the mainstream environmental movement, as well as the growing focus on human welfare issues that began creeping into the movement in the 1960s. Indeed, in a time when mainstream environmentalism has become synonymous with social justice, progressivism, and “sustainable development,” radical environmentalism represents a return to the spiritual grassroots of the early wilderness preservation movement.

Despite the progressivist mantle in which contemporary mainstream environmentalism has wrapped itself, the founders of the wilderness preservation movement, such as John Muir, Aldo Leopold, Benton MacKaye, Robert Sterling Yard, and Bob Marshall, were strongly driven by antimodernist concerns.⁴¹ Stephen Fox characterizes the nineteenth- and early twentieth-century American preservation movement as oriented toward rural and wilderness areas, strongly religious, esthetic and spiritual in values, middle- and upper-class in sympathy, and informed by a view of history as decline and regression.⁴² Much of this applies to the radical environmental movement today. Accordingly, the founding principles of Earth First! included “a deep questioning of, and even an antipathy to, ‘progress’ and ‘technology’ ... For every material ‘achievement’ of progress, there are a dozen losses of things of profound and ineffable value.”⁴³ This questioning of progress goes hand in hand with a valorization of primitive human existence. Earth First!’s principles also include an assertion that “life in a hunter-gatherer society was on the whole healthier, happier, and more secure than our lives today as peasants, industrial workers, or business executives.”⁴⁴ Human history is represented as a decline from a primordial state of freedom and authenticity. While the precise nature of this primeval paradise obviously differs from the Judeo-Christian version, in this respect as in many others, radical environmentalism inherited the pessimistic ethos of the early conservation movement, which was itself informed by a post-Calvinist religious concern with moral decadence and original sin.

On the subject of original sin, another respect in which radical environmentalism revived the religious, post-Calvinist spirit of the early conservation movement was its dim view of humankind. Later in his life, Dave Foreman would recall that “Calvinism only strengthened my seeing Man as flawed and sinful at the core.”⁴⁵ This pessimistic

⁴¹ Dave Foreman, *Man Swarm and the Killing of Wildlife* (Durango, CO: Raven’s Eye Press, 2011), 73.

⁴² Stephen Fox, *John Muir and His Legacy: The American Conservation Movement* (Boston: Little, Brown and Company, 1981), 354–5. For a broader discussion of the antimodernist tradition in American thought, see T.J. Jackson Lears, *No Place of Grace: Antimodernism and the Transformation of American Culture, 1880–1920* (New York: Pantheon Books, 1981).

⁴³ Foreman, *Confessions of an Eco-Warrior*, 28.

⁴⁴ *Ibid.*

⁴⁵ Foreman, *Take Back Conservation*, 304.

assessment of human nature, for the early wilderness preservationists, was often prompted by human greed, ignorance, and inability to appreciate or comprehend the beauty of nature. In 1870 John Muir railed against “the blank, fleshly apathy” that characterized the vulgar multitudes befouling his wilderness sanctuary, who looked upon the wonders of the Sierras “with about as much emotion as the horses they ride upon.”⁴⁶ Radical environmentalism also shares many of these sentiments, exacerbated by a more contemporary concern that human overconsumption and overpopulation are leading to ecological catastrophe. This rejection of anthropocentrism can sometimes shade into misanthropy. Notoriously, Pete Dustrud claimed in an early *Earth First! Journal* article that “the heart and soul of EARTH FIRST! philosophy is that the human race resembles a cancer, which is rapidly devastating the Earth and Her community of life, and leading toward a massive ecological breakdown.”⁴⁷ Foreman proclaimed that “in our decimation of biological diversity, in our production of toxins, in our attack on the basic life-support system of Earth, in our explosive population growth, we humans have become a disease—the Humanpox.”⁴⁸ Watson likewise enjoined his readers to “think of our species as the AIDS of the earth,”⁴⁹ elsewhere claiming: “I know who my enemy is. It is me and it is each one of us. It is the human species, this hyper-glorified naked primate.”⁵⁰ Similar pronouncements abound in the literature of radical environmentalism.

However, despite these strongly deflationary claims concerning the human species, it would be a mistake to conclude that radical environmentalism is motivated by a hatred for the human race. Indeed, this apparent misanthropy often conceals a more elevated kind of religious humanism, one that regards the overcoming of anthropocentrism—and belief in a greater sacred whole transcending humankind alone—as necessary to both the preservation of ecological integrity and a fulfilling human life. As one Earth First! activist writes, “My misanthropy ... comes from the fact that I see the interconnectedness between my race and nature and unfortunately, the horrors that excessive humanity has unleashed on it ... I am a misanthrope because I love the Earth and all its inhabitants. I am a misanthrope because I love.”⁵¹ The upshot of this anti-anthropocentrism is a conviction that humanity must become natural again, a “plain member and citizen” of the biotic community, returning to its proper role in the sacred natural order. This belief was shared, to greater or lesser degrees, by early preservationists such as Thoreau, Muir, and Leopold.

Radical environmentalism also revived the early conservation movement’s fundamental concern with wilderness preservation, which is also basically religious in inspiration. Foreman described Earth First! as “a fundamentalist revival within the wilderness/wildlife preservation movement,” a return to the principles of Aldo Leopold, Bob Marshall, John Muir, and Henry David Thoreau.⁵² Among all environmental

⁴⁶ Fox, *John Muir*, 14.

⁴⁷ Pete Dustrud, “Recreating,” *Earth First! Journal* 2.3 (1982): 6.

⁴⁸ Foreman, *Confessions of an Eco-Warrior*, 57.

⁴⁹ Watson, “On the Precedence of Natural Law,” 79–90.

⁵⁰ Lamya Essemlali and Captain Paul Watson, *Interview with a Pirate: Captain Paul Watson* (Buffalo, NY: Firefly Books, 2013), 55.

⁵¹ Speckled Ohm Moonbeam and Phil Werrei, “In Defense of Misanthropy,” *Earth First! Journal* 19.7 (1999): 21.

⁵² Dave Foreman, “Deep Ecology Vision Passion Courage,” *Earth First! Journal* 7.4 (1987): 28.

groups active in the late twentieth century, Earth First! was probably the one most deeply committed to wide-scale wilderness preservation, particularly in the decade following its inception in 1980. For this new school of activists, wilderness was to be the central issue, the “basic unit” of radical environmentalism. Thus, the Earth First! statement of principles reads:

The preservation of wilderness is the fundamental issue. Wilderness does not merely mean backpacking parks or scenery. It is the natural world. The arena for evolution, the caldron from which humans emerged, the home of the others with whom we share this planet. Wilderness is the real world; our cities, our computers, our airplanes, our global business civilization are all but artificial and transient phenomena.⁵³

While the early wilderness movement upheld the spiritual, recreational, and esthetic significance of wilderness, contemporary radical environmentalists believe that wilderness deserves defense because it possesses *inherent value*: it is the arena of evolution, “the real world,” and humanity’s first home on Earth, whose very presence challenges the anthropocentric illusions of human dominance.

However, while radical environmentalism prioritizes the defense of wilderness for its own sake, it also recognizes the spiritual significance of the wilderness experience. As Foreman writes, “Most conservationists and biologists recognize today that the primary value of wilderness is not as a proving ground for young Huck Finns and Annie Oakleys ... Nevertheless, preserving a quality wilderness experience for a human visitor, letting him or her flex Paleolithic muscles or seek visions, remains a tremendously important second purpose.”⁵⁴ In this respect, it is loyal to its roots in the early wilderness preservation movement, which often emphasized the value of wilderness as a bastion of aristocratic values in a mass age—of independence and solitude, discipline and struggle, spiritual elevation and artistic contemplation.⁵⁵

Conclusion

In short, the militancy of radical environmentalism is not based upon a simple acknowledgment of ecological laws nor upon an abstract philosophical acceptance of ecocentric principles, but upon a thoroughgoing sense of attunement to and reverence for the ecological order. This can be understood as a revival of the strongly spiritual ethos of the early wilderness preservation movement, a response to the increasing professionalization, moderation, and human welfare focus of mainstream environmentalism in the latter half of the twentieth century. Unlike its nineteenth-century predecessor, however, radical environmentalism is uniquely concerned with

⁵³ Foreman, *Confessions of an Eco-Warrior*, 27.

⁵⁴ *Ibid.*, 63.

⁵⁵ See Robert Marshall, “The Problem of the Wilderness,” in *The Great New Wilderness Debate*, (eds.) J. Baird Callicott and Michael Nelson (Athens, GA: University of Georgia Press, 1998), 92.

direct action in defense of the Earth—quite simply, because such a militancy was not necessary until recent times.

Certain trends in radical environmentalism since the dawn of the new millennium indicate a steady diminishment in these high religious attitudes. Bron Taylor has noted the decline of overtly religious expressions among the recent generation of activists in favor of cultural and political approaches to ecological resistance.⁵⁶ Some vocal activists have come to reject many of the earlier religious trappings as unnecessary or malign forms of “cultural appropriation,” and argue that an exclusive concern with wilderness has blinded the movement to questions of social justice.⁵⁷ This inclusion of more human-oriented concerns may be commendable, at least from a strategic perspective. However, in abandoning its religious roots radical environmentalism risks losing what makes it so unique—its challenge to the secular, anthropocentric, instrumentalist outlook of modernity—as well as the very thing that provides the strongest justification for militancy in defense of the Earth.

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⁵⁶ Bron Taylor, “Forward: Experimenting with Truth,” in *Igniting a Revolution: Voices in Defense of the Earth*, (eds.) Stephen Best and Anthony Nocela II (Oakland: AK Press, 2006), 2.

⁵⁷ For evidence of these trends, see Shane Jimerfield, “Toward Cross Cultural Organizing,” *Earth First! Journal* 17.4 (1997): 23; People of Color Caucus, “We See Color and It Fucking Matters,” *Earth First! Journal* 28.4 (2008): 11, 24; SibiTaj Mahal, “Fishbowl at Wild Roots, Feral Features,” *Earth First! Journal* 33.1 (2013): 17–20; Molly Jane, “Eco-Liberation: The Renewal of Radical Environmentalism,” *Earth First! Journal* 3.1 (2013): 3, 32, 60.

Strategic Peacebuilding and an “Integral Ecology”

Michael Yankoski

Introduction

Canadian political scientist Thomas Homer-Dixon recently offered a dire summary of the *social and political* implications of the growing body of evidence supporting theories of anthropogenic climate change, arguing “climate stress may well represent a challenge to international security just as dangerous—and more intractable—than the arms race between the United States and the Soviet Union during the cold war or the proliferation of nuclear weapons among rogue states today.”¹ Comparing the threat of ecological destruction to the threat of nuclear winter might seem extreme to some, but the comparison is warranted.

Seeking to address the widespread social, political, and ecological effects of aggregate human activity, Pope Francis released the second encyclical document of his papacy—entitled *Laudato Si’: On Care for Our Common Home*—in June 2015.² The encyclical is addressed to “every person living on the planet” (§3) with the purpose of highlighting the “urgent need for a radical change in the conduct of humanity” (§4). *Laudato Si’* articulates an invitation to “a sustainable and integral development” (§13) that manifests appropriate “concern for nature, justice for the poor, commitment to society, and interior peace” (§10). This encyclical’s clarion call came not a moment too soon, for thoughtless and unrestrained human activity on a global scale is already turning our common home into an “immense pile of filth” (§10), with egregious implications for all of Earth’s inhabitants, human and nonhuman alike.

I would like to thank Celia Deane-Drummond and Rebecca Artinian-Kaiser for their thoughtful suggestions, criticisms, and edits on an earlier version of this chapter.

¹ Thomas Homer-Dixon, “Terror in the Weather Forecast,” *New York Times* (April 24, 2007). Quoted in Gregory White, *Climate Change and Migration: Security and Borders in a Warming World* (Oxford & New York: Oxford University Press, 2011), 3.

² All parenthetical citations are from Pope Francis, *Laudato Si’* (Encyclical “On Care for Our Common Home”), Vatican website, May 24, 2015. Accessed September 27, 2016. http://w2.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_encyclica-laudato-si.html

Human activity affects more than just other members of our own species. Whereas it took an asteroid impact to cause the fifth great extinction event on planet Earth some 65 million years ago, the aggregate³ activity of human beings is now initiating our planet's sixth great extinction.⁴ In an attempt to capture the *geologic* scale of human impact on the planet, in 2002, atmospheric chemist Paul Crutzen began popularizing the term "Anthropocene."⁵ Crutzen argued that "[c]onsidering these and many other major and still growing impacts of human activities on earth and atmosphere, and at all, including global, scales, it thus is more than appropriate to emphasize the central role of mankind [*sic*] in geology and ecology by using the term 'anthropocene' for the current geological epoch."⁶ While the term "Anthropocene" has gained significant cultural currency in recent years, the varied and often contradictory ends toward which the term is employed hinder its analytical precision and salience. As Maria Antonaccio notes, responses to the term "Anthropocene" often "veer wildly between rage at human arrogance, at one extreme, to awe-struck confidence in the human juggernaut, at the other."⁷ Antonaccio argues that before the notion of the "Anthropocene" can be responsibly included in the construction of robust moral arguments, it must first be "de-moralized," by which she means limiting the term to a purely descriptive role and rejecting the flimsy "is-ought" arguments sometimes associated with it. Once employed in this limited descriptive role, the notion of the "Anthropocene" functions as a lens by bringing into focus many of the destructive impacts of aggregate human activity. In addition, the notion's temporal valences accomplish the difficult task of rendering visible the effects of human actions that have occurred over extended periods of time. It is for these two reasons that I use the term "Anthropocene" within this chapter in this restricted, descriptive sense.

³ While the aggregate impact of human activity is destructive on a global scale, this is not to suggest that the responsibility is equally shared or that the implications are equally distributed and felt. Indeed, those whose lifestyles depend more upon fossil-fuel derived energy are far more complicit in a host of environmental consequences—from climate change and all the related ills of fossil-fuel extraction—than those whose lives are less dependent on such energy sources. In addition, those whose lives are more dependent upon local ecosystemic stability—whether in terms of consistent and predictable rainfall patterns or annual animal migrations, etc.—are more likely to feel the immediate implications of destabilized ecosystems more than those whose lives are more disconnected from local ecologies. Put simply, the Global North is more responsible for global ecological destruction than is the Global South, while the effects and consequences of global ecological destruction will impact the lives and livelihoods of the Global South more than the Global North. Despite these inequalities in responsibility and consequence, I argue in this chapter that speaking of the aggregate impact of human activity as a *species* is still warranted so long as these provisions and a certain restriction of terms are kept in mind.

⁴ Edward O. Wilson, *The Creation: An Appeal to Save Life on Earth* (New York: Norton, 2006), 74.

⁵ The term "Anthropocene" was originally coined by ecologist E.F. Stormer to describe humanity's impact on the planet in the early 1980s. See E.F. Stormer, "Confronting the Anthropocene," *New York Times* (May 11, 2015). Online: http://dotearth.blogs.nytimes.com/2011/05/11/confronting-the-anthropocene/?_r=0 (accessed September 27, 2015). Also, concerning capitalization of the term: while Crutzen did not capitalize the term in his essay, standard convention regarding geologic periods includes capitalization, and thus I have chosen to follow this convention in this chapter.

⁶ Paul Crutzen, "The 'Anthropocene,'" *Journal De Physique Iv* 12.PR10 (2002): 1–5.

⁷ Maria Antonaccio, "De-moralizing and Re-moralizing the Anthropocene," in *Religion in the Anthropocene*, (eds.) Celia Deane-Drummond, Sigurd Bergmann, and Markus Vogt (Eugene, OR: Wipf and Stock, 2017).

Within the specific context provided by this restricted utilization of “Anthropocene,” the field of international peace studies has an important role to play in analyzing the social and political implications of widespread environmental destruction, and more pointedly, how widespread environmental destruction may affect human social and political relations. Because human social, political, and cultural institutions emerged amid generally stable environmental and planetary biophysical systems of the Holocene, it is likely that large-scale ecological destruction and destabilization of those same planetary biophysical systems will have an effect on human social, political, and cultural institutions. There is a growing awareness in the peace studies community that these changes are not likely to be positive. Scholars are beginning to explore how environmental destruction might impinge upon notions of basic human rights, the concepts of national and human security, and the ideal of durable, lasting peace. Indeed, a recent UN report argued that “climate change and [human] migration are amongst the greatest challenges to human security in our times.”⁸ This intersection of environmental destruction, the constellation of causes of violent conflict, and the aspiration of peaceful human relationships is the nexus at which the field of international peace studies offers a distinct set of analytical tools and conceptual frameworks that may prove helpful in engaging the enormous task of navigating the perils facing our common home.

In this chapter, I argue that the interdisciplinary field of international peace studies—and particularly the organizing conceptual apparatus of strategic peacebuilding (SPB)—is directly aligned with Pope Francis’s invitation to cultivate an “Integral Ecology” in the face of the many forms of devastation currently facing our common home. I advance this argument in three primary movements. First, I draw from theorists in the field of peace studies to locate our common “ecological catastrophe” within the conceptual framework of direct, structural, and cultural forms of violence, and particularly the interrelated notion of “slow violence.” The second movement explores the conceptual apparatus of SPB. I argue that SPB’s emphasis on systems theory and an inherently hybrid approach to the transformation of systems of violence into systems of peace is helpful when considering ways to effectively cultivate an “Integral Ecology” while resisting hegemony. In the third movement, I examine the recent Syrian civil war and subsequent population displacement as one illustration of the kind of devastating social and political consequences global environmental degradation is helping generate.

After demonstrating the conceptual alignment between the field of international peace studies and *Laudato Si*’s articulation of an “Integral Ecology,” I conclude this chapter by placing the field of international peace studies as a learner “at the feet” of Pope Francis. One of the most significant conceptual limitations in the field of international peace studies is an all too anthropocentric orientation. In this final section, I highlight specific ways that the expansive vision of an “Integral Ecology”

⁸ Timothy Bryar, Valeria Bello, and Cosmin Corendea. “Promoting Human Security and Minimizing Conflict Associated with Forced Migration in the Pacific Region,” United Nations University (2015), 31. Online: <http://gcm.unu.edu/publications/policy-reports/pacific-prejudice-and-conflict-in-forced-migration-issues.html> (accessed September 28, 2016).

offered in *Laudato Si'* provides a helpful corrective to this myopia and thereby expands and deepens peace studies' understanding of what "peace" entails.

Analyzing violence, defining peace

Since its inception, the scholars of international peace studies have engaged in robust discussion and theorization regarding the nature and characteristics of both violence and peace. In 1969, one of the founders of the field of peace studies, Johan Galtung, broadly defined violence as a situation in which "human beings are being influenced so that their actual somatic and mental realizations are below their potential realizations."⁹ Galtung added further conceptual clarity to this basic understanding of violence, suggesting a tripartite framework representing *distinct but interrelated kinds* of violence. Perhaps the most commonly understood form of violence is "direct violence." Direct violence entails a clear and identifiable act in which an actor (or actors) exerts force upon a victim (or victims) in a discrete act (or acts): a punch is thrown, a shot is fired, a bomb is dropped, a war is fought. But beyond this straightforward understanding of the notion of violence, Galtung identified two distinct but related forms of violence beyond direct violence: structural violence and cultural violence.¹⁰ Galtung argues that structural violence is violence that is "built into the structure and shows up as unequal power and consequently as unequal life chances."¹¹ Structural violence is more opaque, less immediately obvious than direct violence. But by pushing one's analysis a bit deeper into underlying social structures and systems, a kind of built-in, systemic violence may become apparent, wherein certain individuals enjoy different chances to flourish than do others and perhaps even at the expense of others. Galtung argued that the phrase "social injustice" is synonymous with the notion of structural violence, particularly when it comes to the power to determine the utilization of resources: "The situation is aggravated further if the persons low on income are also low in education, low on health, and low on power—as is frequently the case because these rank dimensions tend to be heavily correlated due to the way they are tied together in the social structure."¹² Although the kinds of violence experienced amid social injustice are distinct from (though related to) direct violence, the effects are no less egregious: certain individuals find their chances to flourish vastly diminished when compared to others. Galtung suggests that if we but have eyes to see it, it will become apparent that those who are comparatively low on income, low in education, low on health, and low on power are likely suffering under structural forms of violence.

Cultural violence forms the third point on Galtung's "Violence Triangle," existing in dynamic relation with direct and structural violence. Galtung argued that cultural violence is found embedded in "those aspects of culture, the symbolic sphere of our existence—exemplified by religion and ideology, language and art, empirical science

⁹ Johan Galtung, "Violence, Peace, and Peace Research," *Journal of Peace Research* 6.3 (1969): 167–91.

¹⁰ *Ibid.*, 170.

¹¹ *Ibid.*

¹² *Ibid.*, 171.

and formal science (logic, mathematics)—that can be used to justify or legitimize direct or structural violence.”¹³ Cultural violence acts as a legitimator for the other forms of violence: it “makes direct and structural violence look, even feel, right—or at least not wrong.”¹⁴ One evident example of cultural violence (along with interrelated forms of structural and direct violence) is racial segregation in the United States. “On top” of the direct and structural forms of violence, there exists a kind of “legitimation” or “justification” of the structures of segregation and the use of direct violence needed to enforce these structures. Systems of violence that are operative on all three poles of Galtung’s “Violence Triangle” are especially challenging to engage and disarm due to the myriad, complex, and durable ways in which they are manifest through the practices of everyday life within a society.¹⁵ Galtung’s theoretical framework helped to reveal the kinds of interrelationships that exist between these distinct forms of violence and thus identified complex realities that must be targeted if violence is to be adequately understood and addressed in a given context. Thanks to Galtung’s work, many scholars in the field of peace studies today work diligently not only to analyze violence in the simplistic terms of direct violence but also to identify and analyze the larger and interrelated systems of violence that prevent people from flourishing.

More recently, the notion of “slow violence,” or violence that is not immediately evident but that takes time to manifest its destruction, has gained salience. Whereas a bomb or a bullet tends to fit into Galtung’s notion of “direct violence” in an immediate temporal horizon, the notion of “slow violence” helps to bring into focus the reality that some kinds of actions—while seemingly innocuous when viewed in short time frames—in fact have devastating consequences in aggregate over years or generations. Herein the long temporal horizon embedded in the descriptive term “Anthropocene” becomes particularly relevant. Rob Nixon defines slow violence as “a violence that occurs gradually and out of sight, a violence of delayed destruction that is dispersed across time and space, an attritional violence that is typically not viewed as violence at all.”¹⁶ Many kinds of ecological destruction are identifiable through Nixon’s definition of “slow violence,” as when the slow pollution of waterways renders traditional lifeways impossible, or depleted uranium munitions cause birth defects and higher incidents of cancers in generations born long after a ceasefire has been implemented.¹⁷ While I do not here have space to adequately explore the implications, it is worth noting that there is substantial resonance between the theological notions of structural sin and the notion of slow violence, particularly in the sense that individual actions and moral decisions are subsumed within and rendered negligible within larger systemic forces.¹⁸

¹³ Johan Galtung, “Cultural Violence,” *Journal of Peace Research* 27.3 (1990): 291–305.

¹⁴ *Ibid.*, 291.

¹⁵ Indeed, the persistence of racialized violence in the United States demonstrates how tightly interwoven and durable systems of cultural, structural, and direct violence can be. The ongoing police shootings of unarmed black men are but one manifestation of the insidiousness of racialized violence, as is the United States’ “prison industrial complex” so deftly analyzed in Michele Alexander, *The New Jim Crow* (New York: The New Press, 2012).

¹⁶ Rob Nixon, *Slow Violence and the Environmentalism of the Poor* (Cambridge, MA: Harvard University Press, 2011), 2.

¹⁷ *Ibid.*, especially chapters 3 and 7.

¹⁸ See, for example, Cynthia Moe-Lobeda, “Structural Violence as Structural Evil,” in *Resisting Structural Evil: Love as Ecological-Economic Vocation* (Minneapolis: Fortress Press, 2013), 49–80.

Slow violence is often rendered invisible by short attention spans and conceptualizations of violence that are too narrow to sufficiently analyze the multitudinous ways people may be influenced “so that their actual somatic and mental realizations are below their potential realizations.” Proper attention to the severe implications of “slow violence” requires “that we complicate conventional assumptions about violence as a highly visible act that is newsworthy because it is event focused, time bound, and body bound.”¹⁹ The concept of “slow violence” thus expands the conception of what counts as violence and therefore what it means for individuals or communities to be negatively affected by such forms of violence. When the notion of “slow violence” is brought into conversation with Galtung’s distinctions between direct, structural, and cultural violence, the widespread ecological destruction characteristic of the Anthropocene becomes identifiable as a particular sort of violence emerging at the intersection of direct, structural, and cultural violence extended over long temporal horizons.

In addition to the precision and perspicuity gained through the careful elucidation of distinct forms of violence, the field of peace studies has also helped to press the definition of “peace” beyond the simplistic formulation “not war.” Along these lines, Galtung introduced a helpful distinction between “negative peace” and “positive peace.” While “negative peace” is the absence of “direct violence,” Galtung suggests that “positive peace” is best understood as a social system free of structural and cultural forms of violence.²⁰ Galtung was adamant, however, that a notion of “positive peace” be conceived not “as a point but as a region—as the vast region of social orders from which violence is absent.”²¹ Nuanced by Nixon’s notion of slow violence, we must also add that “positive peace” requires the absence of direct, structural, and cultural violence *even over long durations of time*. An environmental context that supports—rather than hinders—human life is necessary in the “vast region” of positive peace, thus excluding any form of slow violence as well. This “vast region” of positive peace is conceptualized as a social system in which the flourishing of each participant and community is not only *not* thwarted, but is positively supported and encouraged, and is supported and encouraged over a time horizon necessary for the potential somatic and mental flourishing of its members to become more fully realized.

While the granularity offered by specific definitions of violence and peace is helpful, scholars in the field of peace studies often orient their work not only toward analysis of violence and theorization about peace but also toward the practice of working to help establish peace. It is to one such method in the field of peace studies that we now turn.

The strategic peacebuilding approach

Many scholars in the field of peace studies hold the classical Latin adage *Si vis pacem, para bellum* (if you want peace, prepare for war) to be misguided. Instead, these

¹⁹ Ibid., 3.

²⁰ Galtung, “Cultural Violence,” 167–91.

²¹ Ibid., 168.

scholars argue that a more helpful dictum would be “*Si vis pacem, pacem faciat*” (if you want peace, build peace). This second adage is all the more crucial, given the scope and severity of the environmental destruction humans are causing and the implications of this destruction on human social and political organization. Nothing short of robust analyses and appropriate, strategic engagement with the causes and implications of the ecological devastation will be sufficient for the realization of positive peace amid such instability in planetary environmental systems. The approach known as SPB provides a framework both for analyzing the causes, vulnerabilities, and multifaceted implications of the Anthropocene and also for generating the kinds of synergistic and multisectoral relationships and processes necessary to help promote systems of durable, positive peace. Two aspects of SPB make it especially well suited for facing the challenges presented in the Anthropocene: its inherent *systems theory* and *multidisciplinary* approach as well as its capacity for *hybridity* in accommodating differing, contextually relevant conceptualizations of peace.

Scott Appleby and John Paul Lederach describe SPB as entailing a “comprehensive perspective that does not restrict the inquiry/practice to the immediate presenting concern but embeds it in a systemic, encompassing analysis.”²² Adequately embedding the inquiry and practice of SPB in a “systemic, encompassing analysis” requires a systems-theory approach grounded in multidisciplinary forms of analysis. Systems-theory approaches posit that social reality is a complex and dynamic whole, constituted by—as Rob Ricigliano points out—“the interaction or relationships among parts, the interconnectedness of parts, feedback and dynamic causality, and patterns.”²³ A systems-theory approach to SPB is also multisectoral, acknowledging that there are different scales of analysis needed and thus different levels of human action and relationships that must be activated and coordinated if systems of violence are to be transformed into systems of positive peace. While an International Relations approach might be necessary to think strategically and constructively about the necessary international accords that will be required to mitigate violence amid mass population displacement in the Anthropocene, a sociological or ethnographic frame of analysis might be more revealing when considering the kinds of social movements or grassroots organizations that can help accomplish successful accommodation and resettlement of climate refugees. Just as no single discipline has a complete set of tools to adequately collect or interpret all of the relevant data, so no single research approach is adequate when faced with a reality as complex as war or the Anthropocene. Thus, the methodological orientation of SPB is inherently multidisciplinary, seeking to empower collaboration across scholarly fields within a systems-theory approach. Only through such an approach will a simultaneously robust and dynamic picture of on-the-ground realities be gained. And only thus might the difficult and lengthy process of transforming systems of violence into systems of durable, positive peace begin.

²² John Paul Lederach and R. Scott Appleby, “Strategic Peacebuilding: An Overview,” in *Strategies of Peace: Transforming Conflict in a Violent World*, (eds.) Daniel Philpott and Gerard Powers (New York: Oxford University Press, 2010), 39.

²³ Rob Ricigliano, *Making Peace Last: A Toolbox for Sustainable Peacebuilding* (Boulder, CO: Paradigm Publishers, 2012), 21–2.

This notion of “transformation” of violent social systems is a distinct evolution from other approaches of “conflict resolution” in the field of peace studies. Whereas the classical notion of “conflict resolution” implied that discrete conflicts may be “resolved” and that violence will therefore “cease,” many scholars of SPB today prefer to utilize the language of “conflict transformation” instead. Because the “conflict resolution” approach tended to orient itself primarily toward ceasefires or treaties, it often failed to adequately address the multifaceted underlying tensions and incompatibilities that gave rise to outbursts of direct violence in the first place. The “conflict transformation” model seeks to attend more holistically to these underlying incompatibilities. The language of “violence episodes” versus “violence epicenters” is helpful here, with classical conflict resolution models focusing on distinct conflict “episodes” of conflict, whereas conflict transformation models focus on underlying conflict “epicenters” that generate distinct conflict “episodes.”²⁴ Scholars committed to SPB insist on a multidisciplinary approach and a systems-theory orientation in the process of “conflict transformation” as a way of insisting that—even if a ceasefire is reached—unless the underlying incompatibilities and tensions are adequately addressed, the ceasefire will likely not do much to cultivate a durable positive peace. Thus, the SPB approach attempts to identify and analyze conflict epicenters while equipping and empowering a multifaceted and multisectoral approach to the transformation of systems of violence into systems of durable, positive peace.

It is precisely here that SPB’s inherently hybrid approach becomes so evidently crucial. Instead of merely imposing external (i.e., “Western”), hegemonic, or totalizing frameworks or “best practices” (approaches that have been criticized as neocolonial),²⁵ SPB emphasizes *hybrid* conceptualizations of peace. The emphasis on hybridity takes into account the fraught relationship between “global” or “international” norms or standards with “localized” ideals of peace and human flourishing. In her article “Can a Critic Be a Caretaker Too?” religious studies scholar Atalia Omer suggests a “hybrid” approach to SPB, which is intended to limit the potentially negative implications of hegemonic impositions of Western legal structures, notions of justice, and definitions of “peace” through careful, intentional partnerships within specific contexts. Such a “hybrid” approach, notes Omer, “does not paternalistically propose telling people how they should think of themselves and their group identity in a way that will be more appealing to a UDHR orientation.”²⁶ Rather, hybridity offers SPB a way “to engage creatively and offer relevant expertise to peacebuilding processes in imagining the transformation of relational patterns.”²⁷ With its inherent hybridity, the SPB approach

²⁴ John Paul Lederach, *The Little Book of Conflict Transformation: Clear Articulation of the Guiding Principles by a Pioneer in the Field* (Intercourse, PA: Good Books, 2003), 34.

²⁵ See, for example, Oliver Richmond, *A Post-Liberal Peace* (New York: Routledge, 2011).

²⁶ Atalia Omer, “Can a Critic Be a Caretaker Too? Religion, Conflict, and Conflict Transformation,” *Journal of the American Academy of Religion* 79.2 (2011): 459–96. Despite the widely acknowledged import of the UDHR (Universal Declaration of Human Rights), the Declaration and the multifaceted governmental apparatuses required to enforce it are critiqued by some as clear examples of paternalistic imposition of Western values into non-Western contexts (see Richmond, *A Post-Liberal Peace*). Hybridity of the sort envisioned by scholars of SPB seeks to mitigate paternalistic impositions while still seeking to incorporate valuable aspects of human rights frameworks.

²⁷ Omer, “Can a Critic Be a Caretaker Too?” 459–96.

empowers stakeholders to collaborate with other relevant actors to define and then coordinate collective approaches to conflict transformation. Thus, the SPB model of conflict transformation is one of synergy, partnership, and cooperation, where need and resources are aligned in processes aimed at transforming systems of complex and multifaceted violence into systems of durable, positive peace.

Given the complexities entailed in the Anthropocene as well as the difficulty of reimagining the local, regional, national, and international relationships that will likely be necessary to accommodate the widespread human population displacements resulting from anthropogenic climate change and other forms of ecological destruction, SPB is distinctly positioned to help humanity navigate this new epoch in search of an “vast realm” of positive peace. Because the conceptual apparatus of the SPB approach can also be deployed in a preventative mode, this apparatus also has the capacity to identify areas of potential vulnerability in order to begin the process of cultivating more robust systems of hybrid peace that will be poised to accommodate the multifaceted challenges caused by widespread environmental destruction. The time is urgently upon us: SPB in a preventative, anticipatory mode is one of the crucial “adaptation” strategies that must be employed as our planet’s sixth extinction event deepens, as climate change becomes more pronounced, and as local ecosystems deteriorate. The consequences of failing to adequately prepare for climate-related conflicts in particular are dire, and it is to one contemporary illustration that I now turn.

A recent illustration: Syria

Thomas Friedman traveled to Syria for a 2013 column in the *New York Times* covering the country’s civil war. When he asked a displaced Syrian farmer whether the war was in some way about the country’s recent and devastating three-year drought, her response was “of course the drought and unemployment were important in pushing people toward revolution.”²⁸ While the causes of the Syrian war with its 4.8 million international refugees²⁹ and more than 7 million internally displaced persons³⁰ are impossible to ascertain in a simplistic and reductionist way, there is a growing consensus that anthropogenic climate change is in part responsible for amplifying the underlying causes of conflict in the Fertile Crescent region. The recent publication of a report in the Proceedings of the National Academy of the Sciences (PNAS) provides a helpful summary of environmental factors in the current Syrian war and refugee crisis.

The Fertile Crescent has endured multiyear (i.e., more than three years) droughts in the past, with such droughts recorded in the 1950s, 1980s, and 1990s. However, the most

²⁸ Thomas Friedman, “Without Water, Revolution,” *The New York Times* (May 18, 2013). Online: <http://www.nytimes.com/2013/05/19/opinion/sunday/friedman-without-water-revolution.html> (accessed September 28, 2016).

²⁹ UNHCR, “Syrian Regional Refugee Response.” Online: <http://data.unhcr.org/syrianrefugees/regional.php> (accessed September 28, 2016).

³⁰ UNHCR, “Syria Crisis: Total Number of Syrian Refugees Exceeds Four Million for First Time.” Online: <http://www.unrefugees.org/2015/07/total-number-of-syrian-refugees-exceeds-four-million-for-first-time/> (accessed September 28, 2016).

recent multiyear drought that began in 2007 is the most substantial drought recorded in the instrumental record.³¹ The effects of this drought were further intensified by the reduction in the level of the groundwater supplies due to the preceding multiyear drought in the 1990s. Given the lack of rainfall and the reduced availability of groundwater, the multiyear drought beginning in 2007 caused the near-total collapse of agriculture in Syria, resulting in total crop failure and the death of nearly all livestock in the country.³² This agricultural collapse generated substantial social upheaval, as grain prices more than doubled in some regions, and farmers who were no longer able to support themselves and their families on the land began a massive migration into the cities. School enrollment in some agricultural areas dropped by 80 percent, even as the country as a whole absorbed an estimated 1.3–1.5 million Iraqi refugees who fled into Syria between 2003 and 2007.³³ By 2010, the estimated total urban population in Syria swelled to 13.8 million from approximately 8.9 million in 2002, representing a growth of over 50 percent in less than a decade.³⁴ Areas affected by mass urbanization were “marked by illegal settlements, overcrowding, poor infrastructure, unemployment, and crime” and “became the heart of the developing unrest” against the Assad regime.³⁵ While the PNAS report does not suggest the drought was the singular cause of the Syrian civil war, it is adamant that any accurate analysis of the situation must include the 2007 multiyear drought as a contributing factor.

Beyond the general demographic data, three things are crucial to note from the PNAS report regarding the Syria situation’s relationship to the notion of the Anthropocene: (1) the severity of the 2007–2010 drought in Syria is difficult to explain without the combined effect of natural variability and an anthropogenic long-term reduction in rainfall; (2) because Syria is a country marked by poor governance and unsustainable agricultural practices, the drought and associated mass urbanization had a “catalytic” effect and “contributed” to political unrest; and (3) state-of-the-art climate models predict that these kinds of severe, multiyear droughts will become more prevalent in the region and that the Fertile Crescent “is likely to disappear by the end of the twenty-first century as a result of anthropogenic climate change.”³⁶ The implications of such a reality in the area’s political relationships are substantial.

The whole of the Fertile Crescent is already an area fraught with intense and long-standing underlying political instabilities, and massive population displacements are prone to affect these instabilities in ways that are difficult to predict. Beyond the immediate geographic region, the Syrian crisis has proven that the implications of mass population displacements are not only restricted to the immediate context. As of early autumn 2015, Germany had declared an “open door” policy for Syrian refugees, a policy that was estimated to result in some 10,000 refugee arrivals per day for a

³¹ C.P. Kelley et al., “Climate Change in the Fertile Crescent and Implications of the Recent Syrian Drought,” *Proceedings of the National Academy of Sciences of the United States of America* 112.11 (2015): 3241–6.

³² *Ibid.*

³³ *Ibid.*

³⁴ *Ibid.*

³⁵ *Ibid.*

³⁶ *Ibid.*

total of 1.5 million refugees by the end of 2015.³⁷ While Germany’s hospitable refugee policy has been lauded by some, others are using it to galvanize a far-right perspective, evidenced by almost daily attacks on refugee centers.³⁸ In the European Union (EU) more generally, a forced majority vote overrode the possibility of a consensus vote regarding the EU’s acceptance of Syrian refugees, an event the *New York Times* described as evidencing “a crumbling of European values.”³⁹ Indeed, Stefano Stefanini, a former senior Italian ambassador, warned that the Syrian refugee crisis “risks bursting the E.U. at its weak seams.”⁴⁰ Beyond the political and social tensions caused in the immediate context, such mass and rapid population displacement like what has been seen in the Syrian refugee crisis has the power to strain international relationships and even threaten conceptualizations of refugee rights amid the high ideals represented in agreements like the Universal Declaration of Human Rights.

While the PNAS report is hesitant to ascribe any sort of direct causal responsibility for the Syrian war to anthropogenic climate change, it does argue that such warming trends have played a “catalytic” role in the current conflict. These particular claims are corroborated by the general warnings in the Working Group II report of the IPCC’s AR5, where it is argued that “increased human insecurity may coincide with a decline in the capacity of states to conduct effective adaptation efforts, thus creating circumstances in which there is greater potential for violent conflict, especially in the absence of means to resolve conflicts effectively.”⁴¹ As illustrated by Syria, fragile states are particularly susceptible to the catalytic effects of anthropogenic climate change that may disrupt weak agricultural sectors, magnify preexisting tensions and conflicts, and drive population displacement across national and even regional boundaries. Put simply, the recent Syrian civil war illustrates the intimate linkage between ecological and climactic stability with political and regional stability. Or, in negative terms, damaged ecosystems and deteriorating local weather patterns and global climate patterns are likely to pose increasing threats to positive peace.

Limning synergy: Strategic peacebuilding and *Laudato Si’*

There are several areas of conceptual linkage and therefore opportunities for synergistic collaboration between *Laudato Si’* and the organizing conceptual apparatus of SPB. While a full exploration of relevant areas of overlap would require a book-length

³⁷ Kate Connolly, “Refugee Crisis: Germany Creaks under Strain of Open Door Policy,” *The Guardian* (October 8, 2015). Online: <http://www.theguardian.com/world/2015/oct/08/refugee-crisis-germany-creaks-under-strain-of-open-door-policy> (accessed September 28, 2016).

³⁸ Ibid.

³⁹ Steven Erlanger and James Kanter, “Plan on Migrants Strains the Limits of Europe’s Unity,” *The New York Times* (September 22, 2015). Online: <http://www.nytimes.com/2015/09/23/world/europe/european-union-ministers-migrants-refugees.html> (accessed September 28, 2016).

⁴⁰ Ibid.

⁴¹ W.N. Adger et al., “Human Security,” in *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel of Climate Change*, (eds.) C.B. Field et al. (Cambridge and New York: Cambridge University Press, 2014), 760.

treatment, I will here limn only two particular areas that are especially salient: (1) SPB's systems-theory approach and *Laudato Si's* evident epistemological humility and (2) SPB's articulation of positive peace and *Laudato Si's* call for an "Integral Ecology."

First, there is strong overlap between the systems-theory approach demanded by SPB and *Laudato Si's* emphasis on epistemological humility and willingness to engage in dialogue with and learn from the hard and social sciences. Recall the aforementioned systems-theory and multidisciplinary approach in SPB. This methodological approach is grounded in complexity theory, namely the assumption that human social interactions are not linear processes at all but rather include complex webs of causality, feedback, and dynamic flows. Approaching complex systems with a single method is foolhardy and reductionist and results in inaccurate understandings and interpretations. At several points, *Laudato Si'* acknowledges the complexity of addressing the damage humans have wrought to "our common home." In one such statement, *Laudato Si'* argues: "Given the complexity of the ecological crisis and its multiple causes, we need to realize that the solutions will not emerge from just one way of interpreting and transforming reality" (§63). *Laudato Si'* also affirms the necessity of integrating scientific approaches with wisdom traditions in order to repair the damage we have done to our common home: "If we are truly concerned to develop an ecology capable of remedying the damage we have done, no branch of the sciences and no form of wisdom can be left out, and that includes religion and the language particular to it" (§63). Both SPB and *Laudato Si'* recognize that what is needed to address the massive problems constitutive of the Anthropocene is a measure of epistemological humility, a willingness to draw from the methods and findings of a variety of sources and approaches. No single methodological or scholarly approach is sufficient to adequately model or analyze the challenges humans are now facing.

Additionally, recall Galtung's articulation of positive peace not as a single, definite point but as a "vast region," that is, a social system free of direct, structural, and cultural forms of violence, which is supportive of each member's "potential mental and somatic realizations."⁴² Positive peace is therefore strongly resonant with the broader framework of "Integral Ecology" expressed in *Laudato Si'* as a vision of a flourishing that does not exclude human beings but that transcends them and integrates the whole of creation in the harmonious relationships intended by God. While the vision of "Integral Ecology" promoted by *Laudato Si'* is rooted in the Catholic Social Tradition's notion of "integral human development," it goes beyond this historically anthropocentric frame to rightly situate human beings within the larger environmental and ecological context. Thus, *Laudato Si'* calls for cultivation of flourishing within multiple relational frames: environmental, economic, social, cultural, and daily (§137ff). Indeed, the final sections of *Laudato Si'* articulate the fulfillment of "Integral Ecology" in the language of spirituality, inviting all people toward the cultivation of a "sober and satisfying life" marked by "inner peace": "Inner peace is closely related to care for ecology and for the common good because, lived out authentically, it is reflected in a balanced lifestyle together with a capacity for wonder which takes us to a deeper understanding of life" (§225). In these and many other ways, the "vast region" of positive peace articulated

⁴² Galtung, "Cultural Violence."

by Galtung nearly half a century before Pope Francis’s papacy began is profoundly resonant with the expansive vision of “Integral Ecology” described in *Laudato Si’*.

While there are many other areas of conceptual overlap and potential for synergistic collaboration between Pope Francis’s invitation to “to all men and women of good will” and those working toward positive peace through the framework provided by SPB, the constraints of this chapter have allowed me to adumbrate only two of the most immediately obvious: (1) SPB’s systems-theory approach and *Laudato Si’*’s evident epistemological humility and dialogue with the social sciences and (2) SPB’s articulation of positive peace and *Laudato Si’*’s call for an “Integral Ecology.” There is much more work to be done to adequately explore these areas of conceptual overlap and to begin developing the kinds of synergistic relationships at all levels of human social organization that will help realize an “Integral Ecology” and positive peace.

Laudato Si’’s invitation to peace studies

I have argued that there is strong and direct alignment between the field of peace studies—and particularly the conceptual apparatus of SPB—and Pope Francis’s invitation in *Laudato Si’* toward an “Integral Ecology.” Beyond these areas of collaboration and synergy, there is also at least one crucial lesson that the field of international peace studies, and even the methodological subset of SPB, needs urgently to learn from *Laudato Si’*. This is an invitation to expand the very conception of “peace” that peace studies works with.

Since its conception, peace studies has been largely concerned with anthropocentric construals of peace. Built into Galtung’s definitions of peace and violence is a fundamental anthropocentrism: “Violence is present when *human beings* are being influenced so that their actual somatic and mental realizations are below their potential realizations.” In contrast, the vision of “Integral Ecology” found in *Laudato Si’* expands beyond *homo sapiens*, suggesting that the conceptual structures relating to violence and peace within the field of peace studies must be expanded as well. *Laudato Si’* speaks of a “relationship of mutual responsibility between human beings and nature” (§67) and holds up St. Francis as an exemplar whose “response to the world around him was so much more than intellectual appreciation or economic calculus, for to him each and every creature was a sister united to him by bonds of affection” (§11). While the ills facing our common home are largely due to the rapaciousness of human beings manifest through global commodity flows, *Laudato Si’* commends the cultivation of a sense of relational unity between humans and the natural world, including other species and creatures, in the hopes that “if we feel intimately united with all that exists, then sobriety and care will well up spontaneously” (§11). Sobriety. Unity. Affection. Care. Not only between humans, but in fact between humans and the larger natural world within which all of human existence is held and by which it is sustained. This is the expansive invitation articulated by *Laudato Si’*, an invitation that the field of peace studies and the method of SPB alike would do well to heed.

Conclusion

In this chapter, I have sought to demonstrate the areas of conceptual overlap and possible synergy between Pope Francis's 2015 encyclical *Laudato Si'* and the work of scholars in the field of international peace studies, including the conceptual and methodological apparatus of SPB. As I submit a final round of edits on this chapter, Donald Trump has just become the 45th president of the United States of America. His inauguration has brought with it an administration that not only seems to prioritize profit over ecological integrity but that also explicitly denies anthropogenic climate change even as it actively seeks to repress the findings of its own scientists. While the United States is by no means the only country whose economic activities are responsible for widespread ecological destruction, the United States' power in the international political and economic realms suggests that much of the crucial work that needs to be done if humans are to transition to less ecologically destructive practices is being actively thwarted. Thus, my motivation for seeking to limn areas of conceptual overlap and possible locations for synergistic collaboration is heightened: there is much urgent work that needs to be done. A willingness to cross disciplinary, traditional, and religious boundaries in order to discover and partner with allies is crucial. The very possibility of flourishing—both human and nonhuman alike—hangs in the balance.

“Encourage us, we pray, in our struggle/for justice, love and peace” (§246).

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Against the “Unity” of Babel: Liberation Theology and the Language of Sustainable Development

Daniel P. Castillo

The imperative to hear and respond to “the cry of the poor” stands at the heart of liberation theology.¹ Along these lines, liberation theology affirms that love of God must be expressed through love of neighbor,² emphasizing that “neighbor” refers especially to “the least of these” (Mt. 25:34–40)—those who are no account to the powers of the world.³ Appropriately, then, Jon Sobrino finds that the central aim of liberation theology is to help Christian communities enter into the work of “taking the crucified peoples down from their crosses.”⁴

Within the contemporary global context, this work has become increasingly complex. Today, for liberation theology to continue to fulfill its aim, it must take into account the pressing realities of the ecological crisis.⁵ This is because it has become clear

¹ Accordingly, Gustavo Gutiérrez defines theology as “critical reflection of Christian praxis in light of the Word of God”; see Gustavo Gutiérrez, *A Theology of Liberation: History, Politics, and Salvation*, 15th anniversary edition (Maryknoll, NY: Orbis, 1988), 11. Not all liberationists approach the discipline in a theocentric manner. Recently, for example, Ivan Petrella follows the work of Jung Mo Sung in arguing for a liberationist method that excises God-talk from its discourse. On this point, see Ivan Petrella, *The Future of Liberation Theology: An Argument and a Manifesto* (Burlington, VT: Ashgate, 2004), 22–45.

² This is a point made by Gutiérrez among others. See Gutiérrez, *A Theology of Liberation*, 114–15.

³ This reflects God’s own preferential option for the poor. On this point, see Gustavo Gutiérrez, “The Option for the Poor Arises from Faith in Christ,” *Theological Studies* 70.2 (2009): 317–26. See also Gutiérrez, “Option for the Poor,” in *Mysterium Liberationis: Fundamental Concepts of Liberation Theology*, (eds) Ignacio Ellacuría and Jon Sobrino (Maryknoll, NY: Orbis, 1993), 235–50. For an explication of the “option” that emphasizes its connection to God’s desire for justice, see José María Vigil, “The Option for the Poor Is an Option for Justice, and Not Preferential: A New Theological-systematic Framework for the Option for the Poor” in *Revista Electrónica Latinoamericana de Teología*. Available online: <http://servicioskoinonia.org/relat/371e.htm> (accessed September 27, 2016).

⁴ Jon Sobrino, “Preface to the English Edition,” in *Mysterium Liberationis: Fundamental Concepts of Liberation Theology*, (eds) Ignacio Ellacuría and Jon Sobrino (Maryknoll, NY: Orbis, 1993), xiii. Sobrino’s striking terminology comes from his mentor, the martyred Jesuit philosopher Ignacio Ellacuría. See especially Ignacio Ellacuría, “The Crucified People: An Essay in Historical Soteriology” in *Ignacio Ellacuría: Essays on History, Liberation, and Salvation*, (ed.) Michael E. Lee (Maryknoll, NY: Orbis, 2013), 195–225.

⁵ This is a point numerous liberationists have recognized. The most notable examples of this recognition are found in the respective works of Leonardo Boff and Ivone Gebara. See Leonardo Boff, *Cry of the Earth, Cry of the Poor* (Maryknoll, NY: Orbis, 1997). See also Ivone Gebara, *Longing for Running Water* (Minneapolis, NY: Fortress, 1999). It should also be noted that the term

that social realities cannot be neatly separated from ecological realities.⁶ Questions of social justice are necessarily intertwined with those of environmental ethics.⁷

With these points in mind, Pope Francis captures well the complexity of the contemporary context in his encyclical *Laudato Si': On Care for Our Common Home*. There Francis writes, "We are faced not with two separate crises, one environmental and the other social, but rather with one complex crisis which is both social and environmental."⁸ Francis continues, asserting, "We have to realize that a true ecological approach ... must integrate questions of justice in debates on the environment, so as to hear *both the cry of the earth and the cry of the poor*."⁹ In the same vein, he maintains, "Strategies for a solution demand an integrated approach to combating poverty, restoring dignity to the excluded, and at the same time protecting nature."¹⁰ Liberation theology, therefore, can take its cue from Francis by working to explore and respond to the complex ways in which the "cries" of Earth and poor are entangled.¹¹

In this chapter, I consider how liberation theology might begin a substantive engagement with both environmental science and environmental ethics. Specifically, I focus on the manner in which liberation theology might help the people of God (and all persons of good will) think critically about the rhetoric and practices of sustainable development as they are commonly presented in public discourse. To this end, the aim of my argument is modest. I do not attempt to posit a fully developed set of principles aimed at guiding policy or norming the social structures of the global political

"ecological crisis" simplifies somewhat the situation that the world now faces. Johan Rockström finds that multiple planetary boundaries are currently being transgressed, each of which can be understood as a crisis unto itself. On the concept of planetary boundaries, see Johan Rockström et al., "A Safe Operating Space for Humanity," *Nature* 461 (2009): 472–5.

⁶ Here the discourse of political ecology is particularly important. Political ecology analyzes the ways in which political power shapes environmental realities throughout the world. For a helpful introduction to this field, see Paul Robbins, *Political Ecology: A Critical Introduction*, 2nd edn. (Hoboken: Wiley-Blackwell, 2011).

⁷ This has long been the argument of environmental justice advocates. For a representative example of this discourse of environmental justice, see Kristin Shrader-Frechette, *Environmental Justice: Creating Equality, Reclaiming Democracy* (New York: Oxford University, 2002).

⁸ Pope Francis, *Laudato Si': On Care for Our Common Home* (Huntington, IN: Our Sunday Visitor), §139.

⁹ *Ibid.*, §49. It must also be noted that for Pope Francis, the cry of the poor also encompasses future generations of human persons who will inherit the legacy of human abuse of the Earth. For example, the pope writes, "That is why the New Zealand bishops asked what the commandment 'Thou shall not kill' means when 'twenty percent of the world's population consumes resources at a rate that robs the poor nations and future generations of what they need to survive'" (*ibid.*, §95).

¹⁰ *Ibid.*, §139.

¹¹ Lisa Sideris observes that theologians engaging with environmental ethics have used the terminology of liberation theology in problematic ways. She notes a tendency on the part of ecotheologians to speak of the "liberation of nature" from suffering and the causes of suffering. However, as Sideris argues, this is an unhelpful formulation of the goal of environmental ethics because predation, competition, and suffering are engrained into the very fiber of biotic life. The liberation of nature, thus understood, would necessarily entail the rejection of nature as well as its complete domination. Lisa Sideris, *Environmental Ethics: Ecological Theology and Natural Selection* (New York: Columbia University, 2003), especially 112–15, 209–12. In this chapter, I do not place liberation theology into dialogue with environmental ethics in this way. Instead, the call for liberation, here, refers to the need to transform the political economic structures of the global system that have thrust the world into its contemporary ecological crisis. In referring to the "cry of the earth," then, I do not refer to the cry that emerges from evolutionary suffering. Instead, I am concerned with the response of the Earth to humanity's unsustainable global political economy.

economy. Instead, in taking a cue from Stephen Gardiner, my primary intention “is to get clearer about the nature of the problem itself, as a preliminary to generating and assessing potential solutions.”¹² For, as Gardiner writes, “Sometimes clearly identifying the problem is a crucial step.”¹³ In taking this step, I begin by examining more fully the distinguishing elements of liberation theology and the historical context out of which Latin American liberation theology emerged.

The “one language” of Babel

In order to elucidate further the distinctive character of liberationist discourse, it is instructive to consider Gustavo Gutiérrez’s commentary on the biblical story of the “tower of Babel” (Gen. 11:1–9). In the Babel narrative, the builders of the city—unified by their one language—endeavor to construct a tower reaching to the heavens. God observes the builders’ attempt at self-deification and responds by undoing their project, scattering the city’s inhabitants throughout the Earth and confusing their tongues so that the inhabitants no longer speak the same language.

As Gutiérrez notes, God’s action in this narrative is commonly interpreted as a punishment, one that is indicative of Divine judgment on the Promethean efforts of humanity.¹⁴ As far as it goes, Gutiérrez affirms this view. “Unquestionably,” he writes, “we have here a rejection of the haughtiness of those building the city and the tower.”¹⁵ Nonetheless, Gutiérrez finds that this interpretation fails to capture adequately the broader meaning of the story.

Asserting that “the text must be read as the fruit of the painful experience of a subjugated people,” Gutiérrez finds it crucial to consider the manner in which the tower is the product of oppression.¹⁶ In view of this, he writes, “More than a Promethean enterprise of rivalry with God, [the project of the builders] is a political attempt, totalitarian in nature, to dominate people.”¹⁷ Gutiérrez’s assertion, here, resonates well with the broader witness of scripture. The author of the Babel narrative, after all, demonstrates elsewhere a keen awareness of the manner in which the world’s imperial projects are predicated upon the violent exploitation of the poor and marginalized.¹⁸

¹² Stephen Gardiner, *A Perfect Moral Storm: The Ethical Tragedy of Climate Change* (New York: Oxford Press, 2011), 4.

¹³ *Ibid.*

¹⁴ Gustavo Gutiérrez, “Theological Language: Fullness of Silence,” in *The Density of the Present: Selected Writings* (Maryknoll, NY: Orbis, 1999), 194.

¹⁵ *Ibid.*, 196.

¹⁶ *Ibid.*

¹⁷ *Ibid.*, 196–7.

¹⁸ Here, one need only to consider the initial words and actions of Pharaoh in dealing with the Hebrews in the book of Exodus: “Come let us deal shrewdly with them,” pharaoh commands. “Accordingly,” as the passage reads, the Egyptians “set supervisors over the Israelites to oppress them with forced labor. Thus they had to build for Pharaoh the garrison cities of Pithom and Raamses. . . . So the Egyptians reduced the Israelites to cruel slavery, making life bitter for them with hard labor, at mortar and brick and all kinds of field work—cruelly oppressed in all their labor” (Exod. 1:10–13). It should be noted that Pharaoh’s initial directive “Come let us. . .” echoes the words of the builders in the story of Babel, whose refrain is identical. This echo establishes an important connection between the two texts and suggests that “the builders” and Pharaoh stand as parallel figures within the stories.

Citing the repressive character of the builders' project, Gutiérrez affirms that their designs are "indeed an offense against God."¹⁹

The dominative quality of the builders' project also illuminates the character of Babel's unity. As Gutiérrez avers, "The single language is not ... the expression of an idyllic unity of humankind, nor must it be an ideal yearned for; instead, it must be seen as the imposition of an empire. Such a language facilitates centralized power and the political yoke."²⁰ In other words, in this narrative, the one voice with which the builders speak is realized through drowning out the "cries of the poor" and all those who would stand against the aims of the builders. The unity of Babel is achieved through the silencing of "the other."

In light of this, Gutiérrez finds that God's dealings with humanity in the Babel narrative should be interpreted as both a curse and a blessing. Certainly, the architects of Babel's unity would have experienced the confusion of languages and the scattering to the people as a punishment. However, the oppressed peoples of Babel, whose voices were rendered mute by the city's regime of power, would have experienced this "curse" as a blessing. As Gutiérrez writes, "the diversity of languages for oppressed peoples, far from being a punishment, helps protect their freedom. It prevents a totalitarian power from imposing itself with no resistance."²¹ Gutiérrez's observations, here, provide key insights into the methodology of liberation theology, particularly its dialogue with the social sciences.

Liberation theology and the "language" of development

"Language," writes Antonio de Nebrija in *Gramática castellana*, commissioned by Queen Isabel at the dawn of colonialism, "has always gone hand in hand with empire."²² Thus, Gutiérrez's account of the one language of Babel elucidates an important historical characteristic of the nature of domination. Dominative power is not simply realized and sustained through the threat or use of violence. The oppressor can dominate simply by controlling the terms of the discourse through which humanity constructs its understanding of reality. Antonio Gramsci alludes to this mechanism of control when he describes hegemony as the moment in which the dominant bloc "also pos[es] the questions around which the struggle rages."²³ Within the hegemonic moment, the language of critique effectively disappears.

It is with Gramsci's concept of hegemony in view that the emergence of liberation theology might best be understood. For, in many ways, liberation theology irrupted into history as a reaction against the hegemonic regime of the twentieth-century "development project" ushered into existence by US President Harry Truman. In order to grasp the significance of this project, it is necessary to consider something of the historical context out of which it emerged.

¹⁹ Gutiérrez, "Theological Language," 197.

²⁰ *Ibid.*

²¹ *Ibid.*, 198.

²² *Ibid.*, 197.

²³ Antonio Gramsci and Nathan Hoare, *Selections from the Prison Notebooks of Antonio Gramsci* (New York: International, 1971), 182.

By the end of the Second World War, it had become apparent that the colonial project, begun by Spain in 1492, could no longer be maintained. A new paradigm was needed. It was Truman, presiding over the ascendancy of US imperialistic power, who inaugurated a plan for reshaping the relationships between the Global North and South in the wake of colonialism's collapse. In his inaugural address in 1949, Truman lays out his vision for US foreign policy.²⁴ There he proclaims, "We must embark on a bold new program for making the benefits of our scientific advances and industrial progress available for the improvement and growth of underdeveloped areas."²⁵ He continues in this vein, asserting,

The United States is pre-eminent among nations in the development of industrial and scientific techniques. The material resources which we can afford to use for assistance of other peoples are limited. But our imponderable resources in technical knowledge are constantly growing and are inexhaustible. I believe that we should make available to peace-loving peoples the benefits of our store of technical knowledge in order to help them realize their aspirations for a better life. And, in cooperation with other nations, we should foster capital investment in areas needing development.²⁶

Truman's charge was soon echoed throughout the nominal First World with the United Nations proclaiming the 1960s "the decade of development."²⁷

Thus, by the 1960s, the "language" of development appeared to unify the world around a political economic paradigm aimed, ostensibly, at correcting the injustices wrought by colonialism. With its programs of modernization, the development project would shepherd the former colonies into a new era of flourishing. Thus, development, as Pope Paul VI observes in his 1967 encyclical *Populorum Progressio*, became the "new name for peace."²⁸

Liberationists, however, found that this construal of peace appeared more in line with an imperialistic *pax Romana* than the peace offered by Christ. For one, the language of development failed to capture the immediacy and decisiveness of the social and cultural transformation required in the regions of the Global South devastated by crushing poverty. Along these lines, Gutiérrez argues, the developmentalist approach was "synonymous with timid measures, really ineffective in the long run and counterproductive to achieving a real transformation."²⁹

²⁴ Harry Truman, "Inaugural Address: January 20, 1949," *The American Presidency Project*. Online: <http://www.presidency.ucsb.edu/ws/?pid=13282> (accessed September 27, 2016).

²⁵ Ibid.

²⁶ Ibid.

²⁷ See UN Intellectual History Project Briefing Note 7, "The UN and Development Policies" (2010). Online: <http://www.unhistory.org/briefing/7UNandDevStrategies.pdf> (accessed September 28, 2016).

²⁸ Paul VI, *Populorum Progressio: Encyclical of Paul VI on the Development of Peoples*, §76. Online: http://w2.vatican.va/content/paul-vi/en/encyclicals/documents/hf_p-vi_enc_26031967_populorum.html (accessed September 27, 2016). Paul, himself, was critical of the manner in which the development project reduced development to economic growth. For a helpful commentary on Paul's views, see Donal Dorr, *Option for the Poor and for the Earth* (Maryknoll, NY: Orbis, 2012), 155–78.

²⁹ Gutiérrez, *Theology of Liberation*, 17.

In truth, according to liberationists like Gutiérrez, who engaged with the relevant critical social theories of their time, the structures and dynamisms of the development project led to the *underdevelopment* of Latin America (and the broader Global South).³⁰ Seen from this perspective, developmentalism appeared as a form of neocolonialism aimed at “maintaining the disparity” between the Global North and South.³¹ Thus, the language of development actually functioned to obfuscate the true nature of the development project. Indeed, in the Marxian sense of the term, the language of development was an ideology that produced an inversion of reality (e.g., development produced underdevelopment; the dissolution of colonialism produced neocolonialism).

For these reasons, liberation theology called for a rejection of the development project. According to Gutiérrez, “only a radical break from the *status quo*,”³² that is, a paradigm shift away from the structures of developmentalism, would bring about the necessary transformation. In Gutiérrez’s view, it was the language of liberation that best captured the urgency and dramatic nature of this break. As he writes, “Liberation in fact expresses the inescapable moment of radical change which is foreign to the ordinary use of the term *development*. Only in the context of such a process can a policy of development be effectively implemented, have any real meaning, and avoid misleading formulations.”³³ Early liberation theology, thus, made use of critical social theory in an effort to challenge the hegemony of developmentalism and proclaim the need (and instantiation) of a new historical project.

In light of the foregoing analysis, the character of liberation theology can now be further clarified. Liberationist discourse, as I noted at the beginning of this essay, affirms that love of God must be expressed especially through love of the poor and oppressed. However, in working to clarify the demands of this love, liberation theology also seeks to elucidate the root causes of poverty and oppression so that the people of God, through the power of the Holy Spirit, might move to confront and transform these realities. In explicating the causes of dehumanizing inequity, liberation theology adopts a critical socio-analytical approach aimed at contesting the hegemony of the dominant powers. This final point is observable in the manner in which (especially early) liberation theology sought to challenge and interrupt the “unifying” language of

³⁰ The most famous of these theories is the long discredited theory of dependency; see André Gunder Frank, “The Development of Underdevelopment,” *Monthly Review*, 18.4 (1966): 17–31. While the theory itself is outmoded, this does not mean that the fact of dependency is false. On this point, see Arthur McGovern, *Liberation Theology and Its Critics: Toward an Assessment* (Maryknoll, NY: Orbis, 1989), especially 164–76.

³¹ This is in reference to the infamous assertion of US Undersecretary of State George Kennan that we have about 50% of the world’s wealth but only 6.3% of its population. This disparity is particularly great as between ourselves and the peoples of Asia. In this situation, we cannot fail to be the object of envy and resentment. *Our real task in the coming period is to devise a pattern of relationships which will permit us to maintain this position of disparity without positive detriment to our national security.... We need not deceive ourselves that we can afford today the luxury of altruism and world-benefaction.* (Emphasis is mine.)

See Section VII in “Review of Current Trends in US Foreign Policy,” in *Foreign Relations of the United States*, vol. 1 (Washington, DC: US Government Printing Office, 1948). Online: <https://history.state.gov/historicaldocuments/frus1948v01p2/d4> (accessed September 28, 2016).

³² Gutiérrez, *Theology of Liberation*, 17.

³³ *Ibid.*

development in the mid-twentieth century. In effect, liberationists worked to construct a new language capable of posing critical questions with regard to the crisis of material poverty and, in so doing, raised the cry of those whose voices the architects of the development project were attempting to absorb. With these points in view, it is now possible to begin to consider the ways in which liberation theology, with its critical methodology and its commitment to working to take the crucified peoples down from their crosses, might begin to approach today's global eco-social crisis.

Globalization and the language of sustainable development

In recent decades, the development project has given way to what Phillip McMichael terms the globalization project. While this transformation has brought with it notable shifts in the structure of the world's political economy, the globalization project exists in fundamental continuity with its forerunner.³⁴ Both can be understood as forms of neocolonialism that perpetuate disparities in wealth and power between the Global North and South. This is evidenced by the continued growth in the global disparity of wealth over the last half of the twentieth century.³⁵

Nonetheless, an important expansion of terms has taken place in the shift from developmentalism to globalization. Today, the ecological crisis has emerged as a "sign of the times" that is as equally pressing as that of material poverty. Moreover, as I noted earlier, these two signs must be understood as interrelated—one cannot separate the cry of the Earth from the cry of the poor. In practical terms, this means that the validity of the globalization project is now predicated upon its ability to respond effectively to the realities of both the ecological crisis and the crisis of material poverty.

Remarkably, the legitimacy of the globalization project is now tied to two concepts that parallel the legitimizing terms of the development project. Whereas the architects of the development project relied on "development" and "modernization" in arguing that it was capable of responding to "the cry of the poor," the architects of the globalization project now employ the concepts of "sustainable development" and "ecological modernization" in seeking to maintain the project's legitimacy. It is here, then, that questions paralleling those of early liberationists can be raised. One obvious question is this: within the globalization project, does the discourse of sustainable development function analogously to the single language of Babel?

Sustainable development: Ambiguity or obfuscation?

The concept of "sustainable development" became popularized by the United Nations' report, *Our Common Future*.³⁶ Also known as the "Brundtland Report" (in reference

³⁴ On this point, see Gilbert Rist, *The History of Development: From Western Origins to Global Faith* (New York: Zed, 2011).

³⁵ Citing UN data, Leslie Sklair notes that global economic disparity has increased from 35 to 1 to 72 to 1 in the last half of the twentieth century. Leslie Sklair, *Globalization: Capitalism and Its Alternatives* (New York: Oxford University, 2002), 48.

³⁶ Gro Harlem Brundtland (ed.), *Our Common Future: The World Commission on Environment and Development*. Online: <http://www.un-documents.net/our-common-future.pdf> (accessed September 27, 2016).

to its primary author Gro Brundtland), the document examines the possible conflicts between policies aimed at ensuring economic development and those intended to sustain the health of the biosphere. Notably, the report affirms that, in working to counter the crises of underdevelopment and ecological degradation, “painful choices have to be made.”³⁷ In acknowledging this, the Brundtland Report calls for a turn toward “sustainable development,” which it defines as a form of development meeting “the needs of the present without compromising the ability of future generations to meet their own needs.”³⁸

The description of “sustainable development” in the Brundtland Report is intentionally ambiguous. As Herman Daly writes, the meaning is left “sufficiently vague to allow for a broad consensus.”³⁹ While this may have been a politically astute move, the underdetermined meaning of the concept leaves it particularly vulnerable to manipulation. This is precisely David Harvey’s concern when he notes that the language of sustainable development “can rather too easily be corrupted into yet another discursive representation of dominant forms of economic power. It can be appropriated by multinational corporations to legitimize a global grab to manage all of the world’s resources.”⁴⁰

In sharing Harvey’s concern, Gilbert Rist comments on the vagueness of the concept of sustainable development in the Brundtland Report. Rist finds that the concept can be validly interpreted in two contradictory manners. On the one hand, sustainable development can be understood as defining “a production level that can be borne by the ecosystem, and can therefore be kept up over the long term; reproduction capacity determines production volume, and ‘sustainability’ means that the process can be maintained only under certain externally given conditions.”⁴¹ On the other hand, the term can refer simply to sustained economic growth.⁴² For his part, Rist believes that it is the latter definition that actually captures the functional meaning of sustainable development within the global system. He writes, “Even if the bait is alluring, there should be no illusion about what is going on. The thing that is meant to be sustained really is ‘development’, not the tolerance capacity of the ecosystem or of human societies.”⁴³

Sustainable development and hegemonic power

Obviously, an in-depth study of the issues surrounding Rist’s position is beyond the scope of my argument here. Nonetheless, it is possible to point to a number of corresponding findings that help to corroborate his claim. Here, I begin by considering the ongoing relationship between the World Bank and the discourse of sustainable development.

³⁷ *Ibid.*, 3.30.

³⁸ *Ibid.*, 3.27.

³⁹ Herman Daly, *Beyond Growth: The Economics of Sustainable Development* (Boston: Beacon, 1996), 2.

⁴⁰ David Harvey, “What’s Green and Makes the Environment Go Round?” in *The Cultures of Globalization*, (eds.) Frederic Jameson and Masao Miyoshi (Durham, NC: Duke University Press, 1998), 343.

⁴¹ Rist, *History of Development*, 192.

⁴² *Ibid.*, 193.

⁴³ *Ibid.*, 194. Left unstated in Rist’s assertion is the fact that this sustained growth continues to be asymmetric in nature.

In his study of the World Bank, Michael Goldman observes that in recent decades, the Bank has become the world's leading producer of environmental knowledge. Thus, the Bank plays a pivotal role in shaping contemporary understandings of the relationship between human economies and the environment. It is of great importance, then, that Goldman finds that the Bank champions a specific view regarding this relationship. One of the Bank's environmental unit economists aptly describes this view in an interview with Goldman, stating, "When authors of *WDR '92* [the highly influential 1992 *World Development Report* that featured the environment] were drafting the report, they called me asking for examples of 'win-win' strategies in my work. What could I say? None exists in that pure form; there are tradeoffs, not 'win-wins.' But they want to see a world of win-wins, based on articles of faith, not fact."⁴⁴

The concept of "win-win strategies" is significant. It suggests that economic growth is, in fact, positively correlated to reducing negative environmental impacts. While there are instances in which this is the case, even these instances, as the economist interviewed by Goldman makes plain, involve trade-offs. More problematically, however, is the manner in which a "win-win ideology" seems to have eclipsed the Brundtland report's acknowledgment that sustainable development would require "painful choices." Instead of painful choices, the Bank champions a concept of sustainable development that suppresses the reality of trade-offs and instead presents economic growth as a universal (and, hence, unifying) good.⁴⁵ Indeed, Goldman's study reveals a number of mechanisms built into the Bank's structure that help to ensure the Bank's employees conform to its ideology. Thus, Goldman concludes, the Bank's production of environmental knowledge "is less a process of discovery, creativity, and refutation than one of *manufacturing consent*."⁴⁶

An experience that Herman Daly recounts from his time working in the Environmental Department of the World Bank serves to illustrate Goldman's findings. In his book *Beyond Growth*, Daly recounts a series of exchanges he had with peers while working on an important publication for the World Bank entitled *Development and the Environment*. As Daly writes: "An early draft contained a diagram entitled 'The Relationship Between the Economy and the Environment.' It consisted of a square labeled 'economy,' with an arrow coming in labeled 'inputs' and an arrow going out labeled 'outputs'—nothing more."⁴⁷ Daly took issue with the diagram, arguing that it failed to properly capture the relationship between the economy and the environment. Instead, Daly suggested that a box should be drawn around the existing diagram and that this box should then be labeled "environment." Daly wanted to emphasize that "the economy is a subsystem of the environment and depends upon the environment both as a source of raw material inputs and as a 'sink' for waste outputs."⁴⁸

⁴⁴ Michael Goldman, *Imperial Nature: The World Bank and the Struggle for Justice in the Age of Globalization* (New Haven: Yale University, 2005), 128.

⁴⁵ Goldman's study goes on to analyze the ways in which various institutional mechanisms and pressures within the Bank function to produce a single voice with regard to sustainable development discourse. See Goldman, *Imperial Nature*, 100–80.

⁴⁶ *Ibid.*, 148–9.

⁴⁷ Daly, *Beyond Growth*, 6.

⁴⁸ *Ibid.*

According to Daly, the next draft did include the box around the initial diagram; however, the box was unlabeled. Daly again protested, arguing that by not labeling the box “environment,” the box appeared to be simply ornamental and failed to accurately convey the relationship between the economy and the environment. “The next draft,” Daly writes, “omitted the diagram altogether.”⁴⁹

As Daly’s narrative makes clear, within the discursive space of the Bank, the prospect of painful choices is quite literally subject to erasure. Instead, the Bank presents a view of sustainable development that aligns with the aphorism “a rising tide lifts all boats.”⁵⁰ In this view, it is not only the poor who are elevated to higher levels of flourishing through continued economic growth but the ecological health of the planet as well. Thus, in championing a win-win ideology, the World Bank impels the global system forward with what Pope Francis rightly describes as a “cheerful recklessness.”⁵¹

Perhaps even more problematic than the manner in which the Bank controls the language of sustainable development within its own institution is the way that this influence extends beyond its walls. According to Goldman, “Besides being the world’s main producer of concepts, data, analytic frameworks, and policies on the environment, the World Bank has also become the world’s most powerful environmentalist, teaming up with prominent NGOs, scientific institutions, borrowing states, and Northern aid agencies.”⁵² These alliances, in which the Bank always occupies the position of power, dampen the possibility of external critique or alternative visions. Goldman argues, “The Bank’s form of environmental knowledge production has rapidly become hegemonic, disarming and absorbing many of its critics, expanding its terrain of influence, and effectively enlarging the scope and power of its neoliberal agenda.”⁵³ On Goldman’s account, then, it appears that the hegemonic moment has arrived; the dominant bloc controls the discourse of sustainability to such a degree that what qualifies as sustainable development goes unquestioned.

This does not suggest, Goldman writes, “that the world is run by the World Bank president, but rather that the global political economy has at its core a set of elite power networks in whose reproduction the World Bank is deeply embedded.”⁵⁴ The Bank is but one node (albeit an important node) within a broader web of power that shapes the discourse of sustainable development in the contemporary world. It is helpful, therefore, to tie Goldman’s investigation of the Bank within a conceptual framework of this global network.

⁴⁹ Similarly, in an interview with Goldman, Daly observes,

Since the Bank pushes the concept that affluence through development is good for the environment, it’s not possible to make a peep about how this might not be true. A few of us tried to get that point across in *World Development Report, 1992* but they would not allow it—not even a couple of pages. We even tried to publish a ‘minority opinion’ as a separate document, with two Nobel prize winners as main contributors, but the Bank’s censors in External Affairs wouldn’t accept it. The Bank is a tough place to discuss different ideas.

See Goldman, *Imperial Nature*, 143.

⁵⁰ See Joerg Rieger, *No Rising Tide: Theology, Economics, and the Future* (Minneapolis: Fortress, 2009).

⁵¹ Pope Francis, *Laudato Si’*, §59.

⁵² Goldman, *Imperial Nature*, 180.

⁵³ *Ibid.*

⁵⁴ *Ibid.*, 12.

In his analysis of the global system, Leslie Sklair finds that the structures and dynamics of the system are ordered by what he terms the transnational capitalist class (TCC)—a class comprised of globalizing corporate elites, elected officials, and bureaucrats.⁵⁵ According to Sklair, the TCC has transformed the concept of sustainable development into “a major industry” while simultaneously distancing this concept from discussions of the common good.⁵⁶ In so doing, the TCC successfully muted environmental movements that called into question the growth imperative of the global economy. Concepts of sustainability that recognized limits to growth gave way to theories that aligned sustainable development with hyper-industrialization.⁵⁷ Thus, Sklair finds that by the 1990s, a form of “‘sustainable’ global consumerist capitalism” came to dominate the discourse.⁵⁸ Its ethos is captured well by an environmental executive of Loblaw, Canada’s largest food distributor, who proclaims, “If we made a lot of money destroying this planet, we sure can make money cleaning it up.”⁵⁹ Thus, the TCC has constructed a conception of sustainable development, wholly in line with the “win-win ideology” that Goldman finds at the heart of the World Bank’s faith. The degree to which the discourse of sustainable development has been coopted by the TCC leaves Sklair suspicious that the “poacher” has become the “gamekeeper.”⁶⁰

Liberation theology and the environmental sciences: The task ahead

The language of sustainable development is a particularly effective discursive tool. Its effectiveness derives from its inherent ability to allay the fears of persons aware of the crises of material poverty and ecological degradation.⁶¹ Rhetorically, the concept produces a sense of optimism that the structures and dynamisms of the global system are equipped to respond well to these interrelated crises. Accordingly, the concept possesses enormous mobilizing power,⁶² capable of unifying numerous social and political factions around a single common goal.

However, as I have suggested in the foregoing section, there is warrant for skepticism. It appears that the discourse of “sustainable development” permits the architects of the globalization project to produce unsustainable and asymmetric economic growth under the auspices of responding to the cries of the Earth and poor. Here, then, the plausibility structures of the globalization project appear as obfuscation structures. In Rist’s view, the discourse of sustainable development works to sustain the “cover-up”

⁵⁵ Leslie Sklair, *The Transnational Capitalist Class* (Malden, MA: Blackwell, 2001), 17–23.

⁵⁶ Sklair finds that Daly and Cobb’s call for an economics of community, which they identified with sustainable development, “sank almost without trace,” while sustainable development went on to dominate the world’s collective imagination. See Sklair, *Transnational Capitalist Class*, 200.

⁵⁷ *Ibid.*, 201.

⁵⁸ *Ibid.*, 206.

⁵⁹ Susan Vandervoort, “Big ‘Green Brother’ Is Watching,” *Public Relations Journal* (April 1991): 14. Cited in Sklair, *Transnational Capitalist Class*, 253 fn.33.

⁶⁰ Sklair, *Transnational Capitalist Class*, 202.

⁶¹ As Rist writes of sustainable development, “It allays the fears aroused by the effects of economic growth, so that any radical challenge can be averted.” See Rist, *History of Development*, 194.

⁶² Sklair, *Transnational Capitalist Class*, 247.

that began with the colonial project's "discovery" of America.⁶³ Put another way, the language of sustainable development functions to absorb the cries of the Earth and poor, sustaining the hegemonic moment described by Gramsci.

A pressing task for liberation theology, therefore, lies in the work of critically analyzing the ways in which the global political economy actually responds (or fails to respond) to the contemporary eco-social crisis. It is necessary to continue to scrutinize the ways in which the hegemonic powers of the global system have co-opted this language in order to obscure the true nature of the globalized economy. Along these lines, liberationists would do well to examine closely the ongoing debates regarding the contrasting frameworks of "strong" and "weak" sustainability.⁶⁴ If Rist is correct in arguing that the concept of sustainable development remains ascendant through submerging the differences of meaning attributed to it, then it is vital to surface these differences within public and political space. Similarly, the relationship between sustainable development and economic growth must be critically analyzed. Tim Jackson, for one, argues that prosperity must be distinguished from growth in material consumption.⁶⁵ In making this distinction, he calls for a capabilities approach to development that recognizes limits to growth.⁶⁶

One potentially radical challenge to the operative concept of sustainable development comes from Pope Francis when he calls for the preservation of the world's cultural heritages against the onslaught of global consumer culture.⁶⁷ For Francis, the culture of consumerism is an essential component of a global system that prioritizes—to borrow Rist's term—sustaining growth over sustaining the resiliency capacity of Earth. In calling for the conservation of the world's diverse cultural inheritance, especially the insights of indigenous cultures, the pope is in effect advocating for the preservation of myriad worldviews that might serve to contest the fundamental presumptions of development as they function within social imaginary of the globalized world.⁶⁸ Liberation theology must explore further this avenue pointed to by Francis in his encyclical.

⁶³ Rist, *History of Development*, 194. See also, Ignacio Ellacuría, "The Latin American Quincentenary: Discovery or Cover-up?" in *Ignacio Ellacuría*, 27–38.

⁶⁴ Strong sustainability advocates argue that there are limits to the substitutability of natural resources, whereas weak sustainability advocates downplay these limits. See Eric Neumayer, *Weak Sustainability Versus Strong Sustainability: Exploring the Limits of Two Opposing Paradigms*, 4th edn. (Northampton, MA: Edward Elgar, 2013). Any discussion of the prospect of sustainable development must take into account the recent and important work of Jeffrey Sachs, *The Age of Sustainable Development* (New York: Columbia University, 2015).

⁶⁵ See Tim Jackson, *Prosperity without Growth: Economics for a Finite Planet* (New York: Earthscan, 2009). As Jackson argues, one reason that limits must be placed on economic growth lies in the unlikelihood that we will achieve an absolute decoupling of economic growth from environmental impact. On this point, see especially 67–86.

⁶⁶ Within the field of economics, the capabilities approach is perhaps most closely associated with Amartya Sen. See Sen, *Development as Freedom* (New York: Anchor, 2000).

⁶⁷ Pope Francis, *Laudato Si'*, §143–6.

⁶⁸ Here, it is necessary to point out that Francis runs the risk of espousing a romanticized and monolithic view of indigenous cultures as ecologically sensitive. Undoubtedly many are, but this is certainly not a universal fact. On this point, see Shepard Krech, *The Ecological Indian: Myth and History* (New York: W.W. Norton, 1999).

Today it is clear that traditional liberationist concern for the nonperson must be situated within an interrelated concern for the Earth. With this in mind, liberation theology must work to clarify what elements of the global system are to be denounced and elucidate possible frameworks for cultures and political economies that, in fact, hear and respond to the cries of Earth and poor.⁶⁹ These tasks are necessary so that not only the crucified people might be taken down from their cross but the nails can be removed from the tree of life upon which they are now hung.

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⁶⁹ In this essay, I have focused on the manner in which liberation theology might begin a dialogue with the environmental and social sciences. However, by itself, this dialogue leaves the explicitly theological work of liberation theology underdeveloped. Thus, a foundational task for liberation theology is to develop an eco-liberationist hermeneutic through which it can interpret the sources of Christian revelation. This hermeneutic would have to reflect upon the ways in which love of God, love of neighbor, and care for creation are all entangled.

Part Three

Critique

The Environment, the Common Good, and Women's Participation

Lisa Sowle Cahill

Pope Francis's 2015 encyclical *Laudato Si'*, with its comprehensive, energetic, and affecting appeal for environmental justice, provides an opportunity to uplift the role of women in accomplishing this goal. Women globally are more affected than men by environmental degradation, since women typically are responsible for the daily sustenance of their families and communities. In many regions, women cultivate the land more than men. Women are at the vanguard in resisting damage to their local environments. Local action, connected to networks of activists, theorists, and policy-makers, lends momentum to the global cause of eco-justice. The framework of Catholic social teaching as recast by *Laudato Si'* makes it especially clear that it is both necessary and possible to engage women's agency, worldviews, and theologies in efforts toward environmental justice. Yet women's activism is not mentioned in *Laudato Si'*, is not highlighted in Catholic social teaching, and has not emerged as a priority in faith-based organizing around environmental goals.

This chapter will identify ethical, theological, and practical reasons why women's participation is important to the preservation of the ecological common good, and it will show that such participation is already dynamically present and effective. Women's work across cultures and religions is fostered by organizations such as UN WomenWatch; Women's Earth and Climate Action Network, International; the (Roman Catholic nuns') International Union of Superiors General; Franciscans International; Caritas Internationalis; and Catholic Relief Services. Today, theologians and other scholars travel among cultures, convene at international conferences and symposia, and read and cite colleagues from diverse regions, cultures, and religions. No Christian ethics of environmental or gender justice can afford to neglect interdisciplinary, intercultural, and interreligious resources, as Pope Francis's ecology encyclical well displays. The encyclical's own expansion of Catholic social teaching, however, magnifies the question of Zimbabwean-born theologian Tina Beattie: "What about women?"¹

¹ Tina Beattie, "To Pope Francis: What about Women?" *Los Angeles Times*, September 25, 2015. Online: <http://www.latimes.com/opinion/op-ed/la-oe-beattie-pope-francis-women-20150925-story.html> (accessed August 29, 2016).

Laudato Si' as Catholic social teaching

Francis is not the first pope to bring a theological and ecclesial response to environmental threats; his efforts follow those of Paul VI, John Paul II, and Benedict XVI, as well as interventions of various bishops' conferences. Many well-known tools of Catholic social teaching are aptly applied by Francis: the universal common good, the "preferential option" for the poor, solidarity as active commitment to justice, and subsidiarity as a balance of local independence and higher intervention when justice requires. Francis's distinctive notes are inclusion of future generations in the common good, affirmation of the inherent value of all creatures and of the Earth itself, the coherence of the human good and the good of creation ("everything is connected"), and the prioritization of environmental degradation's effects on the poor.

Since the very beginning of his pontificate, Francis has called Catholics (and all Christians) to be a "Church of the poor," immersed in the experience and needs of the poor, serving the poor, and identifying with the poor. It is imperative, therefore, that women's experience and contributions be acknowledged and appreciated as key to Catholic social teaching, as well as justice for the Earth and its inhabitants. Among the poor, women and girls most lack basic necessities and enjoy least access to formal structures of power: "When food is scarce, female family members often get the smallest portions. On the labour market, women are literally paid starvation wages. Mothers also suffer most from lack of medical care and balanced diets. The responsibility for the survival of their children commonly demands additional sacrifices from them."² For this very reason, women constitute a huge resource for resistance and social change.

According to Christina Astorga, a Filipina working in the United States, the same "logic of domination and subjugation" operates in the oppression of the poor, the Earth, and women.³ This situation calls for prophetic lament, deep compassion, and powerful action. Ultimately, women must and can claim their own agency and resist.⁴ In the spirit of Jesus's repudiation of the oppressive powers of his time, Astorga insists that "resistance is rooted in our faith tradition. At the heart of resistance is an alternative vision to a hegemonic belief system that claims the minds and hearts of men and women. It is this vision that propels one to challenge this system, at great cost, sometimes at the cost of one's own life."⁵

Three unique emphases of *Laudato Si'* are especially significant for women's resistance. Francis explicitly acknowledges that ethical analysis and moral appeals have

² "Agriculture at a Crossroads: Findings and Recommendations for Future Farming," *Global Agriculture*, citing the International Assessment of Agricultural Knowledge, Science and Technology for Development (IAAS4:38 AM4/3/18), 2004. Online: <http://www.globalagriculture.org/> (accessed September 6, 2016).

³ Christina Astorga, "The Triple Cries of Poor, Women, and the Earth: Interlocking Oppressions in the Christian Context," in *Doing Asian Theological Ethics in a Cross-Cultural and Interreligious Context*, (eds.) Yiu Sing Lucas Chan, James Keenan, and Shaji George Kochuthara (Bangalore: Dharmaram Publications, 2016), 250–62.

⁴ *Ibid.*, 258. See also Kochurani Abraham, "Resistance: A Liberative Key in Feminist Ethics," in *Feminist Catholic Theological Ethics: Conversations in the World Church*, (eds.) Linda Hogan and A.E. Orobator (Maryknoll, NY: Orbis, 2014), 97–107.

⁵ *Ibid.*, 259.

been ineffectual in addressing the problem at hand because the *political will* (of “minds and hearts”) to do things differently is sorely lacking; that we need a consequent refocusing of effort from analysis and exhortation to a *conversion* of imagination and desire (an “alternative vision”); and that explicit inclusion of *non-Christian religious traditions* as coworkers whose faith strengthens the common effort (given the “triple oppressions” global scope) is necessary.

First, the problem of political will. Since the beginning of the modern papal encyclical tradition in 1891 (with *Rerum Novarum*), the framework employed by Catholic social teaching has been premised on the dignity of the person and the common good, assumed to be in principle intelligible and persuasive to all. The world political system that ostensibly protects these two values consists in sovereign albeit interdependent nation-states, governed by rights, duties, and the rule of law and, since 1945, subject to the authority of a world political authority (the United Nations [UN]). In theory, this system is upheld by human reasonableness and cooperation. Yet papal appeals to “all men of good will” (in the phrase of John XXIII, *Pacem in Terris*) have failed to bring the political and social results envisioned at least as often as they have succeeded.

Francis meets this difficulty head-on. He does not hesitate to call UN advocacy for sustainable development “ineffectual,” fully seeing the frequency with which states obstruct international agreement in the name of “national interests,”⁶ resorting to “power politics.”⁷ Halfway measures that avoid getting to the root of the problem “in no way” amount to “the radical change which present circumstances require” and should be dismissed as a “ploy” to extend excessive consumption by the wealthy.⁸ The pope does not give up on international conventions and norms but realizes that their enactment and implementation depend on the real commitment of parties to negotiations, of governments, and of political constituencies at home. Thus, addressing Catholic popular movements in Bolivia the month after the encyclical appeared, Francis called on community organizers to be “sowers of change,” in line with the demands of their specific contexts.⁹ Women deserve, but do not receive, special attention as agents of change in families, churches, and communities.

A related problem is the “networked” and “disaggregated” nature of international and even national government today. Political scientists such as Anne-Marie Slaughter have shown that not only is there no global governing body (like the UN) that has effective control over states, but that political action often depends on international and transnational entities that can exist both below and above the level of national-states.¹⁰ Examples include the World Trade Organization, the G-20, and the International Energy Agency, as well as national judiciaries and regulatory bodies that consult policies in peer

⁶ Pope Francis, *Laudato Si': On Care for Our Common Home* (2015), §169. Online: http://w2.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si.html (accessed September 7, 2016).

⁷ *Ibid.*, §178.

⁸ *Ibid.*, §171.

⁹ “Pope Francis: Speech at World Meeting of Popular Movements,” July 9, 2015, Vatican Radio. Online: http://en.radiovaticana.va/news/2015/07/10/pope_francis_speech_at_world_meeting_of_popular_movements/1157291 (accessed September 18, 2015).

¹⁰ Anne-Marie Slaughter, *A New World Order* (Princeton: Princeton University, 2004).

states and form transnational governance regimes in specific sectors. Nongovernmental organizations and civil society movements also cross and transcend national borders and can exert pressure on more formal structures and authorities. “Global governance” today means “the collective [if ‘piecemeal’] effort by sovereign states, international organizations, and other nonstate actors to address common challenges and seize opportunities that transcend national frontiers.”¹¹ Complicating the governance picture concerning the environment is that it, like the oceans, can be considered part of “the global commons, those spaces no nation controls but on which all rely for their security and prosperity.”¹² Yet “organizations such as the Climate Group have been able to bring together novel coalitions of cities, businesses and civil society organizations to share and build on initiatives to reduce GHG [greenhouse gas] emissions.”¹³ This complex scenario underlines the question where women fit into the picture and how women can be effective agents and carriers of “governance” for environmental justice.

By appealing to all sectors of society, rather than only to elite bodies such as the UN, by urging broad democratic participation, by citing at least seventeen local bishops conferences, and by urging the mobilization of “community networks,”¹⁴ Pope Francis in effect invokes these emerging forms of political power. Maryann Cusimano Love highlights opportunities for religious organizations, networks, and nongovernmental organizations to affect global policies and practice, noting women’s active participation. “Religious organizations in particular often have well-developed ethics and rich institutions, resources that are useful to transnational advocacy networks and greatly needed today, given the ethical and institutional gaps of globalization.”¹⁵ The Roman Catholic Church has worldwide scope with strong institutional connections both vertically and horizontally. As in most religious traditions, Catholic women lack institutional power in the sense of officially recognized, elite leadership roles, which are typically dependent on clerical status. Yet women are active in local faith communities and are better represented in the leadership of Catholic NGOs than in formal ecclesial structures.

This brings us to Pope Francis’s second distinctive insight that what is needed over good science and ethical argument is a radical conversion of worldviews and commitments. “We lack an awareness of our common origin, of our mutual belonging, and of a future to be shared with everyone. This basic awareness would enable the development of new convictions, attitudes and forms of life.”¹⁶ Because women run the machinery of daily existence, work collaboratively with other women to accomplish mutual goals, and are primary transmitters of family religious life, women have the energy, access, imagination, and desire to create this awareness. “Ecological

¹¹ Stewart Patrick, “The Unruled World: The Case for Good Enough Global Governance,” *Foreign Affairs*, December 6, 2013, 1 of 11. Online: <https://www.foreignaffairs.com/print/1113201> (accessed October 3, 2015).

¹² *Ibid.*, 7 of 11.

¹³ Harriet Bulkeley and Peter Newell, *Governing Climate Change* (Abingdon and New York: Routledge, 2010), 111.

¹⁴ Pope Francis, *Laudato Si’*, §217, §219.

¹⁵ Maryann Cusimano Love, “Nongovernmental Organizations: Politics beyond Sovereignty,” in *Beyond Sovereignty: Issues for a Global Agenda*, 4th edn., (ed.) Maryann Cusimano Love (Boston: Wadsworth, 2011), 77.

¹⁶ Pope Francis, *Laudato Si’*, §202.

conversion” means that all persons and communities recognize their essential “vocation to be protectors of God’s handiwork.”¹⁷ A real will to make a difference requires education and even a new “spirituality.”¹⁸ Certainly *Laudato Si’* is the first encyclical accompanied by a YouTube video using visual images, poetry, and music to engage viewers’ emotions, aesthetic sensitivity, and compassion.¹⁹ The video entices its audience to connect with the beauty of the Earth, the joy of humans in its riches, the ugliness of pollution and desertification, and the suffering of humans (women and children especially) who struggle for the necessities of life.

Examples from Asia, Africa, and Latin America will make clear that advocacy for women and the Earth draws on spiritualities and theologies in which the interdependence of humans and the rest of creation is fundamental and definitive. Often such worldviews originate with indigenous peoples whose values inform Christian sensibilities even today. Third, then, Francis models interreligious responsibility and care for “our common home.” He aims to motivate and empower “a conversation which includes everyone, since the environmental challenge we are undergoing, and its human roots, concern and affect us all.”²⁰

The majority of the world’s cultures are religious, and religion remains a powerful motivator of personal and political action worldwide; Francis does not set faith or Christianity against the “secular” or “secularism,” which is no doubt a greater political force in Western Europe than in the Global South or, for that matter, in the United States. For Francis, religion is pervasive. The spirituality and ethos of “connection” that can overcome apathy and selfishness are profound resources for all peoples. The pope concludes his encyclical with two prayers, one for Christians, another for all who trust in an “all-powerful Creator.” As leader of the world’s Roman Catholics, Francis’s public profile furnishes him a wide audience. Francis’s humility, prophetic social stances, and calls for “mercy” toward all who suffer or are in difficulty have garnered him an immense amount of moral and political capital. He is thus exceptionally well placed to call everyone, on the basis of a creation-centered and cosmic spirituality, “to recognize that we are profoundly united with every creature.”²¹

The remainder of this essay will elaborate women’s participation in environmental justice by first examining women’s production and use of natural resources, especially in agriculture, then by looking at examples of women’s advocacy networks, highlighting Catholic initiatives and their religious and theological inspiration.

Women as agents of environmental justice

Although women bear the main responsibility for care of children and the elderly, they also constitute the majority of the agricultural labor force, especially in rural areas

¹⁷ Ibid., §217, §219.

¹⁸ Ibid., chapter six, “Ecological Education and Spirituality,” §202 ff.

¹⁹ “*Laudato Si’*,” June 18, 2015. Online: <https://www.youtube.com/watch?v=1tYdOIqvpqg&noredirect=1> (accessed September 11, 2015).

²⁰ Pope Francis, *Laudato Si’*, §14.

²¹ Ibid., §246.

in Africa and South Asia. In “developing” countries, women farmers account for 43 percent of all food production, and two-thirds of livestock keepers, with percentages varying by region.²² Yet in many societies, women cannot inherit or own land directly, though they may enjoy a right to cultivate the land of family members or share in the produce of that land. Less than 20 percent of all landowners are women; in North Africa and West Asia, the number is less than 5 percent.²³ The hoarding of African farmland by investors has a deleterious impact on the land use of women, and thus on their livelihoods, food production, and food availability. Beyond these liabilities, women and girls have unequal access to new technologies, to financing mechanisms for innovative food production, and to the political processes that generate policies on resources and agriculture. Yet women bear primary responsibility for family food security, failure of which brings the risk of domestic violence and causes women to undertake means of support that incur dangers such as sexual exploitation and trafficking.

Moreover, “Women’s knowledge, their socio-cultural relationship with the land, and their stewardship of nature are also under threat.” Women are the main conservators of plant varieties and, in some regions of sub-Saharan Africa, may cultivate as many as 120 types alongside the cash crops that only men may manage and whose profits men control.²⁴ Yet for these very reasons, women are reservoirs of agency for change.

Women often have a strong body of knowledge and expertise that can be used in climate change mitigation, disaster reduction and adaptation strategies. Furthermore, women’s responsibilities in households and communities, as stewards of natural and household resources, positions them well to contribute to livelihood strategies adapted to changing environmental realities.²⁵

Indigenous women especially, with their acute knowledge of biodiversity, and of edible and medicinal plants, “should play a leading role in the global response to climate change.”²⁶ This is similarly true of conservation of freshwater and forests, as women and girls in affected regions spend hours a day hauling water and fuel from increasingly distant locations, curtailing girls’ schooling.

To begin with a broad lens, the Women’s Earth and Climate Action Network International (WECAN) has coordinators in the United States, the Democratic Republic

²² “The Female Face of Farming,” Farming First: A Global Coalition for Sustainable Agricultural Development (2014). Online: https://www.farmingfirst.org/women_infographic/ (accessed September 7, 2016).

²³ *Agriculture at a Crossroads: Findings and Recommendations for Future Farming*, 2011, “Women in Agriculture,” *Global Agriculture*. Online: <http://www.globalagriculture.org/report-topics/women-in-agriculture.html> (accessed August 17, 2017).

²⁴ *The State of Agriculture: Women in Agriculture, 2010–2011*, Figure 8, Food and Agriculture Organization of the United States. Online: <http://www.fao.org/docrep/013/i2050e/i2050e.pdf> (accessed September 7, 2016).

²⁵ “Women, Gender Equality and Climate Change,” 2009, 1 of 9, *UN WomenWatch, The UN Internet Gateway on Gender Equality and Empowerment of Women*. Online: http://www.un.org/womenwatch/feature/climate_change/downloads/Women_and_Climate_Change_Factsheet.pdf (accessed September 7, 2016).

²⁶ *Ibid.*, 2–3 of 9.

of Congo, Bolivia, Morocco, and Algeria.²⁷ Its elite advisory board includes Jane Goodall, Vandana Shiva, and Jody Williams (the Nobel-winning landmines activist). WECAN offers climate solutions trainings for local communities in Latin America, the Middle East/North Africa, and DR Congo, expanding its reach by offering women's trainings online for renewable energy, climate change and health, and the rights of nature.

Turning to regional and local efforts, with a range of funding sources, a report from the United Nations Development Fund for Women surveyed the effects of climate change on Adivasi (also known as tribal, "outcast," or Dalit) and indigenous women in India, China, and Southeast Asia.²⁸ As the report notes, "Adivasi and indigenous women may easily have the smallest carbon footprint on earth." Their sustainable livelihood practices include farming, gardening, hunting and gathering, trapping, and their own production of basic goods and services. They typically use environmentally friendly resources and practices, such as rotational agriculture with little or no use of petroleum fertilizers, and the conservation of forests providing a sink for greenhouse gases. Yet indigenous communities have been exploited for outside projects. Often negotiations are conducted with men, who (according to the women) control and drink profits that should replenish household necessities.²⁹ Adivasi women are claiming their rights and demanding gender responsive policies.³⁰ In India, youngest daughters are reconstructing their traditional duty to support all needy family members, asserting rights to parental land to carry out care responsibilities. A women's forest cooperative achieved the reform of payment practices, so men cannot claim the profits of women collectors of the product (the tendu leaf, used for rolling cigarettes). Adivasi women in poor rural areas have used their extensive experience in agriculture to cope with erratic rainfall and drought, replacing traditional crops, cultivating new varieties, and learning "male" craft skills. Self-help groups give market access to women, eliminate middlepersons and overhead, and keep profits within the community.³¹ Turning to Africa, the network Solidarity for the Promotion of Indigenous Women (SPFA) gathers forty-three associations in the Democratic Republic of Congo to work for protection of lands and forests.

Local measures connect with mid-level, national, and international policies. An Amazonian woman in Brazil, Gloria Gaia, defended her family land against loggers and then resolved to help neighbors understand the impact of logging on their livelihoods. She questioned why researchers published only for elites, not making information available to local people from whom data was extracted. Ultimately, Gaia published an illustrated manual for villagers on Amazonian forest species and their use and conservation, and disseminated the message using stories and song. The Brazilian government sponsored a revised version of the manual, including scientists' essays along with the narratives of local people.³²

²⁷ See the Women's Earth and Climate Action Network International website, Online: <http://wecaninternational.org/> (accessed September 1, 2016).

²⁸ Govind Kelkar, *Adivasi Women: Engaging with Climate Change* (New York: UN Development Fund for Women, 2009).

²⁹ *Ibid.*, 24–5.

³⁰ *Ibid.*, 26.

³¹ *Ibid.*, 21–3.

³² Patricia Shanley, "Science for the Poor: How One Woman Challenged Researchers, Ranchers, and Loggers in Amazonia," *Ecology and Society* 11.2 (2006). Online: <http://www.ecologyandsociety.org/vol11/iss2/art28/> (accessed September 6, 2016).

In Kenya, the 2004, Nobel Peace Prize winner Wangari Maathai introduced a grassroots tree-planting movement in 1976, encouraging women to conserve resources and improve their lives, while also thinking beyond immediate needs to the future of their peoples and the continent. In the worldview of the Kikuyu of Kenya, human life and well-being are interwoven with the beauty and bounty of nature. Nature is appreciated and enjoyed as well as turned to human use. The women-led Green Belt Movement planted more than 20 million trees and, in 1986, expanded into a Pan-African effort. Maathai was a public voice on related causes such as land-grabbing in Africa and the cancellation of the debt of poor nations. Before her death in 2011, she spoke to the UN on numerous occasions, highlighting the situation of women.³³

Initiatives and movements such as these develop in relation to specific social, cultural, political, economic, and religious circumstances that impinge negatively both on the environment and on the status of women, especially within communities that are already poor and marginal. They provide inspiration for action elsewhere without offering any blueprint for different locations. Nevertheless, there are striking continuities among situations that call women to be agents of environmental justice. Two of the most important are the low status of women in patriarchal structures and the positive significance of cosmologies that place human beings in integral connection with the natural world. The basic nature of patriarchy has already been well illustrated in the conditions and cases presented.

Deserving more attention are holistic spiritualities that undercut the destructive and unjust exploitation of nature by nourishing appreciation of the interdependence of all creatures and the natural world, and of the mutual reliance of all human beings, of all species, and of Earth, water, and air upon one another. There is no question of anthropocentrism or ecocentrism if humans and nature are mutually conditioning. Humans exist in relation to spiritual beings or powers that transcend the human yet are active in nature and society. The language, symbols, and narratives of indigenous ways of life may not translate easily into a vocabulary analogous to or intelligible within that of “Western” Christianity. Yet these comprehensive beliefs and ways of life are interdependent with and mutually enriching of Christianity as experienced in the same contexts.³⁴ No human, historical religious or moral tradition should be romanticized. Both the Christian scriptures and historical Christianity, as well as the founding myths and traditions of other religions, contain patriarchal (and other) distortions that must be resisted and transformed.³⁵ In fact, the cultural elaboration of the unity of a people with its traditional (or newly conquered) lands can and does lead to competitive and exclusionary claims to territory, even resulting in intergroup violence—not only in Africa and Asia but in the Middle East, Eastern Europe, and the Americas.

That being said, the possibilities for Christian environmental ethics latent in the worldviews of indigenous peoples are immense and are already being reclaimed by

³³ See Wangari Maathai, *Replenishing the Earth: Spiritual Values for Healing Ourselves and Our World* (New York: Doubleday, 2010) and *The Challenge for Africa* (New York: Pantheon, 2009).

³⁴ For examples, see A.E. Orobator, *Theology Brewed in an African Pot* (Maryknoll, NY: Orbis, 2008).

³⁵ Of many relevant sources, see Elisabeth Schüssler Fiorenza, *In Memory of Her: A Feminist Theological Reconstruction of Christian Origins* (New York: Crossroad, 1983); Mercy Amba Oduyoye, *Daughters of Anowa: African Women and Patriarchy* (Maryknoll, NY: Orbis, 2005).

Christians. Some of these explicitly link environmental justice and women. Aruna Gnanadson dates Indian women's resistance to a 1730 protest, led by a woman Amritha Devi, against the cutting of sacred trees by the maharaja's men. Although hundreds of people were killed as they clung to the trees, a decree finally ended the felling of trees. Indian cosmology emphasizes that humans and nature are a "duality in unity." Humans are called to "merge with nature's rhythms and patterns."³⁶ In the Philippines, indigenous women of the Igorot mountain tribe live in harmony with nature because "the earth is a living thing and it has a spirit, just like all the living things in it. The rivers, mountains, trees, rice fields, and so on, each has its own spirits." For women, the main food producers, the Earth is their partner in giving and sustaining life.³⁷ Citing Wangari Maathai's genius at mobilizing people across society, especially women, Teresia Hinga, from Kenya, cites "the indigenous ethics of Ubuntu solidarity (and distributive justice)" to connect all human beings with thriving ecosystems.³⁸ In the traditional Gikuyu ethic of nature, the land belongs to the Creator, who gives each human group a share in its use. Exclusive private ownership was unprecedented until colonial times.³⁹ In Zimbabwe, Shona women were spiritual mediums who led protection of the environment, and even today they possess exhaustive knowledge of nature and agriculture, which should be supported by land rights, education, and financing so that their leadership can be renewed.⁴⁰ Among the Machupe people of Chile, a woman can be called a *machi* or shaman through a dream or vision. The *machi* links the human community, the spirit world, nature, and the divine; she heals with medicinal plants and leads the major annual ritual in which the interconnectedness of all in the rhythm of life is celebrated and equilibrium sought.⁴¹ In Bolivia and Peru, the Earth is called *Pachamama*, the divine mother of all things, while among the indigenous peoples of Colombia, the goddess *Bachué* is the mother of humanity.⁴²

The above initiatives clearly reflect the Catholic social priorities of common good, dignity of the person, subsidiarity, solidarity, participation, preferential option for (and by) the poor, and resistance to oppressive power structures. So what can be said of Catholic initiatives along the same lines? Most Catholics in India in fact are Adivasi, while Brazil is historically a majority Catholic country. Many countries in Africa have a Catholic colonial heritage, and vibrant forms of Christianity are being renegotiated on the continent today. What initiatives are occurring under Catholic auspices to empower women to meet the challenges of environmental justice?

³⁶ Aruna Gnanadson, "Toward a Feminist Eco-Theology for India," in *Women Healing Earth: Third World Women on Ecology, Feminism, and Religion*, (ed.) Rosemary Radford Ruether (Maryknoll, NY: Orbis, 1996), 78–9.

³⁷ Victoria Tauli-Corpuz, "Reclaiming Earth-based Spirituality: Indigenous Women on the Cordillera," in *Women Healing Earth*, 100–1.

³⁸ Christiana Z. Peppard and Andrea Vicini, eds., *Just Sustainability: Technology, Ecology, and Resource Extraction* (Maryknoll, NY: Orbis, 2015).

³⁹ Teresia Hinga, "The Gikuyu Theology of Land and Environmental Justice," in *Women Healing Earth*, 172–84.

⁴⁰ Tumani Mutasa Nyajeka, "Shona Women and the *Mutupo* Principle," in *Women Healing Earth*, 135–42.

⁴¹ Mary Judith Ress, "After Five Centuries of Mixings, Who Are We?" in *Women Healing Earth*, 54–5.

⁴² Gladys Parentelli, "Latin America's Poor Women," in *Women Healing Earth*, 29, 38.

Before considering specific examples, we must realize that, at a very basic level, when women are excluded from essential means of sustenance, subjugated in family and community, and regularly exposed to physical violence, advocacy for women's dignity in general is a precondition of environmental empowerment. All advocacy for gender justice implies advocacy for women's access to land and natural resources—even when “ecology” is not addressed explicitly. There are two deeper problems, however, from the standpoint of Catholic social teaching. The first is that official Catholic defense of women's dignity is hampered by a “complementarity” model of gender. This model furthers the idea, contrary to the ostensible “equality” message, that women belong at home, while men rightfully control family decisions, economic resources, and community government.⁴³ The second, even more intransigent, problem is that whatever defenses of women's dignity may be issued in official documents (the Indian bishops' largely unrealized 2010 Gender Policy being a good example⁴⁴), Catholic teachers, clergy, women and men religious, other church workers, and laity still participate in the same distorted cultural assumptions and practices that normalize evils such as greed, patriarchy, violence, and exploitation of nature. This is precisely why Pope Francis goes beyond improved teaching to initiate a church-wide and worldwide conversionary process.

Though not highlighted in official Catholic social teaching, Catholic women's ecological action is in fact extensive. Let us begin with the International Union of Superiors General (IUSG), which fosters “networking and solidarity” among women religious around the world.⁴⁵ The sisters' projects partner with laypersons, other social sectors, and members of multiple religious traditions. Two of their most important inter-congregational initiatives are “Solidarity with South Sudan” and Talitha Kum, against human trafficking, illegal adoption, debt bondage, and the forced marriage of girls.⁴⁶ The IUSG's Justice, Peace and Integrity of Creation Commission endorses the preferential option for the poor and “is committed to continual learning through observing, reflecting and acting.”⁴⁷ A plenary address at the 2016 assembly connected *Laudato Si'* to the mission of women religious to work for the “conversion of the will” requisite to the “integral ecology” for which the pope calls.⁴⁸

⁴³ John Paul II's rather remarkable 1995 “Letter to Women” praises the women's liberation movement and apologizes for Catholic oppression of women yet still assumes stereotypical gender complementarity. “Letter of Pope John Paul II to Women.” Online: w2.vatican.va/content/john-paul-ii/en/letters/1995/documents/hf_jp-ii_let_29061995_women.html (accessed September 7, 2016).

⁴⁴ Conference of Catholic Bishops of India, *Gender Policy of the Catholic Church of India*, 2010. Online: cbci.in/downloadmat/gender_policy.pdf (accessed September 2, 2016).

⁴⁵ International Union of Superiors General. Online: <http://www.internationalunionsuperiorsgeneral.org/we-are/> (accessed September 6, 2016).

⁴⁶ Ines San Martin, “Women Form the Vanguard of Pope Francis's Agenda,” *Crux*, May 11, 2016. Online: <https://cruxnow.com/church/2016/05/11/women-form-the-vanguard-of-pope-francisc-agenda/> (accessed September 1, 2016).

⁴⁷ IUSG, “Justice, Peace and Creation.” Online: <http://www.internationalunionsuperiorsgeneral.org/mission/justice-peace-and-creation/> (accessed September 6, 2016).

⁴⁸ Carol Zinn, “Crossing the Threshold: Weaving Global Solidarity for the Life of the World,” IUSG Plenary Assembly, Rome, May 9, 2016. Online: http://www.internationalunionsuperiorsgeneral.org/wp-content/uploads/2016/04/PI-2016_-Carol-Zinn_ENG.pdf (accessed September 6, 2016).

Another network, Sisters of the Earth, joins religious sisters with other women activists. One sister teaches at a Jesuit university in Peru and works with Amazonian tribes to fight oil extraction on their lands. Other women work with tribal peoples in North America to enhance healthy food production and sustainable energy sources, while resisting resource extraction, water pollution, and monoculture of crops by outsiders. Through collaborative work in local settings, the women build community that grows awareness and multiplies achievements.⁴⁹

Catholic Relief Services, an international organization sponsored by the US Catholic bishops, combines public and private funding to work with women farmers. These women become forces of resistance against climate change, scarce resources, and poverty. In Kenya, women have engineered a farm irrigation system using lake water. In the Democratic Republic of Congo, a thirty-four-member savings program has purchased three goats and seeds for a community garden. In Vietnam, a woman leads a community of farmers who travel by boat to care for mangrove trees. In India, one woman volunteered a plot of land to test varieties of rice, lentils, and wheat that can help the community survive flooded conditions. In Nicaragua, a women's savings group grows and sells vegetables at local stores and farmers' markets, while another runs a bakery and sells corn flour and cookies to the community.⁵⁰ Finally, in Papua New Guinea, thanks to local climate justice advocate Ursula Rakova, the Catholic Archdiocese of Bougainville and Caritas Aotearoa New Zealand are combining resources to help people of the Carteret Islands deal with coastal erosion and flooding by developing new crops and fishing programs and by improving educational opportunities for young people.⁵¹

Sophia: A convergence of worldviews and spiritualities

These Catholic activities are enlivened by a Christian vision that resonates with the relational cosmology inspiring many traditional religions and indigenous peoples. Most Christian advocates for gender equality turn to Jesus's gospel ministry to and with the poor, including women.⁵² Other common touchstones are the Creator and creation, and the power of the risen Jesus and the Spirit transforming human history and the cosmos. A newer approach with a special affinity to indigenous spiritualities is the theology of Sophia, developed first within Orthodox theology, and then for feminist

⁴⁹ Mandy Erickson, "Sisters of the Earth Convention Brings Together Women Committed to Caring for the Planet," *National Catholic Reporter*, July 12, 2016. Online: <http://globalsistersreport.org/news/environment/sisters-earth-convention-brings-together-women-committed-caring-planet-40951> (accessed September 7, 2016).

⁵⁰ Catholic Relief Services, "The 15 Women Farmers You Need to Meet." Online: <http://www.crs.org/stories/15-women-farmers-you-need-meet> (accessed September 1, 2016).

⁵¹ Media Release, "The Human Face of Climate Change Migration: Ursula Rakova from Carteret Islands, PNG," *Caritas Aotearoa New Zealand*. Online: <http://www.caritas.org.nz/newsroom/media-releases/human-face-climate-change-migration-ursula-rakova-carteret-islands-png> (accessed September 6, 2016).

⁵² See Bonnie Thurston, *Women in the New Testament: Questions and Commentary* (Portland, OR: Wipf & Stock, 2004).

theology by the biblical scholar Elisabeth Schüssler Fiorenza and the systematic theologian Elizabeth Johnson.⁵³ This theology has been embraced and adapted for ecology by Celia Deane-Drummond⁵⁴ and for other cultures by, for example, Kwok Pui-lan, originally from Hong Kong, and Loreen Maseno of Kenya.⁵⁵ Succinctly stated, these theologians recover from the later books of the Hebrew Bible, especially Proverbs and Wisdom, the figure of “Lady Wisdom,” or “Sophia” in Greek, and connect her with the Christian Trinity. In the Hebrew Bible, Sophia is not a divine person but a female personification of God. Sophia is present at and active in creation; she promises, “Whoever finds me finds life” (Wis. 8:35). Sophia governs and redeems all things, and against her “evil does not prevail” (Wis. 7:30). Though sometimes portrayed with maternal characteristics, Sophia more broadly governs, judges, instructs, leads, renews, and makes justice through human society and the entire natural world. Sophia has obvious affinities with the Creator and divine providence. Yet Sophia is also a way to imagine Christ and Spirit, both of whom are divine and active throughout creation. Sophia is associated with Jesus in the Gospel of John, which sees him as an agent in creation (1:1–4) and as the redeeming giver of life (10:10). Paul calls Jesus “the wisdom of God” (1 Cor. 1:24), while Matthew’s gospel portrays Jesus with the characteristics and words of Sophia (11:19). As Spirit, Sophia is a cosmic healing and life-giving force.

Celia Deane-Drummond explicitly develops the figure of Sophia, cosmically present as Word and Spirit, for a theology and ethics of environmental justice.⁵⁶ Representing God’s immanence and God’s transcendence, Sophia links the world and the divine, the sacred and the secular, incarnation and resurrection. Like the cosmological myths of many cultures, and as called for by *Laudato Si*,⁵⁷ Sophia theology attracts and converts through the imagery, poetry, and drama of an aesthetic imagination. Kwok employs Sophia to connect a creation-centered Christian spirituality with the ancient traditions of Asia, which use natural symbols such as mountains and streams, trees and flowers, flowing waters, and the cycle of seasons to capture “an organic, holistic and transformational understanding of the universe.” Imaged as Sophia, Jesus Christ breaks the dichotomy between humans and nature. “The same spirit that moves the wind and fire has come to dwell within us.”⁵⁷ Maseno proposes “an African inculturated

⁵³ See, for example, Schüssler Fiorenza, *In Memory of Her*, 130–40 and *Jesus: Miriam’s Child, Sophia’s Prophet: Critical Issues in Feminist Christology* (London and New York: T&T Clark, 1994); Elizabeth Johnson, *She Who Is: The Mystery of God in Feminist Theological Discourse* (New York: Crossroad, 1994) and *Quest for the Living God: Mapping Frontiers in the Theology of God* (New York: Continuum, 2008), 103–6.

⁵⁴ See Celia Deane-Drummond, “Sophia: The Feminine Face of God as a Metaphor for an Ecotheology,” *Feminist Theology* 6.16 (1997): 11–31; “Ecological Conversion in a Changing Climate: An Ecumenical Perspective on Ecological Solidarity,” *International Journal of Orthodox Theology* 3.1 (2012): 78–104; *Eco-theology* (London: Darton, Longman and Todd, 2008); *Creation through Wisdom* (London and New York: T&T Clark, 2000); *The Ethics of Nature* (Malden, MA and London: Blackwell, 2006), 21–2, 44, 154–5, 174, 220; *Christ and Evolution: Wonder and Wisdom* (Minneapolis: Fortress Press, 2009).

⁵⁵ Pui-lan Kwok, “Ecology and Christology,” *Feminist Theology* 5.15 (1997): 113–25; Loreen Maseno, “Toward an African Inculturated Sophiology: The Case of African Wisdom Tradition from Myths for Ecological Concerns,” in *Religion and Ecology in the Public Sphere*, (eds.) Celia Deane-Drummond and Heinrich Bedford-Stromm (London and New York: T&T Clark, 2011), 125–38.

⁵⁶ See Note 53 above.

⁵⁷ Kwok, “Ecology and Christology,” 117, 125.

Sophiology,” which uses African categories to capture the wisdom of God, linking a sense of the sacred in nature with a Christology of Jesus-Sophia. She draws examples from the Luo, the Agikuyu, and the Kisii peoples of Kenya, for whom sacredness inheres in trees and lakes to which humans are connected by myth and ritual. As Maseno concludes, African myths converge with Sophia theology by envisioning God, the Earth, the spirits or powers of natural entities, and humans in a comprehensive “ecological dynamics.”⁵⁸

Theological ethics is often understood to “apply” religious convictions to social and political problems. But religious construals of the world and theological interpretations are, conversely, shaped by the practical conditions of life in which the divine is sought, encountered, and obeyed. This process is captured perfectly in the recovery and elaboration of the biblical figure of Sophia for feminism, ecology, theology, and politics. Driven by new ecological challenges, Pope Francis envisions all Creation as connected, God as present in all faith traditions, the poor as central to the identity of the Church, and Christian social commitments as authorized and motivated by the base as much as by the *magisterium*. Given the centrality of women’s voice, vision, and action to the goals for which Francis hopes, perhaps the current environmental crisis will finally open the way for a gender-equal Catholic theology, ecclesiology, and social practice.

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⁵⁸ Maseno, “African Sophiology,” 135.

The Planetary Boundaries Framework and Food Production: A Radical Redefinition of Sustainable Development?

Johan De Tavernier

The Brundtland Report reflects a growing concern about the human impact on the global environment combined with the desire for more equality in human relationships. Sustainable development is defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”¹ As Stewart Cohen et al. note, the Brundtland Commission affirmed that

problems of human development (poverty, inequity, basic human needs) could not be separated from, indeed were *causally* connected with environmental problems of resource depletion, biodiversity, pollution and life support systems ... [and that] the explicit linkage of the population and development “problem” in developing countries with the “consumption” problem in industrialized countries meant that SD was inherently a global concept.²

The Brundtland Report’s definition of sustainable development was and still is for many an inspiring anchor point. For instance, in *Laudato Si’*, church officials employ this standard definition of sustainable development.³ But the definition is not unproblematic. The main criticism focuses on the fact that the traditional understanding calls for a “weak” sustainability vision and thereby continues to promote economic growth at the expense of nonhuman creation.

¹ Report of the World Commission on Environment and Development, “Our Common Future” (1987), §27. Online: <http://www.un-documents.net/our-common-future.pdf> (accessed August 1, 2017).

² Stewart Cohen et al., “Climate Change and Sustainable Development: Towards Dialogue,” *Global Environmental Change* 8.4 (1998): 351 (emphasis added).

³ Pope Francis, *Laudato Si’: On Care for Our Common Home* (2015), §167. Online: http://w2.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si.html (accessed August 1, 2017).

Divergent opinions about what sustainability means lie in the background of the debate over interpretations and understandings of sustainable development. Slowly, new understandings of sustainability have come to the surface. One of them is the planetary boundaries framework, developed by Johan Rockström (director of the Stockholm Resilience Centre) and Will Steffen of Australian National University.⁴ Rockström and Steffen state that there is an urgent need for a new way of understanding development in relation to the maintenance of the earth system in a resilient way. Their planetary boundaries framework provides a science-based analysis of the functioning of the earth system and identifies levels of human-caused perturbations, taking into consideration the precautionary principle. They mention nine critical processes—land-system change, biosphere integrity (genetic and functional integrity), climate change, ocean acidification, novel entities, stratospheric ozone depletion, atmospheric aerosol loading, biochemical flows (nitrogen and phosphorus cycles), and freshwater⁵—regulating the Earth’s ecosystem. The planetary boundaries framework makes it possible to assess the risk to the stable functioning of the earth system due to anthropogenic impacts. For each process boundary, scientific values are established in order to indicate a “safe operating space” below which the resilience of the earth system will not be eroded. From the viewpoint of the planetary boundaries framework, social and economic sustainability must be situated within ecological limits. Sustainability is thus no longer a half-hearted and weak compromise between environmental, social, and economic sustainability as proposed by the Brundtland Commission. In this chapter, attention is devoted to this “strong” interpretation of sustainable development and its implications for food production.

Sustainable development: A debated concept

The meaning and proper implementation of sustainable development have been highly debated from the beginning, partly due to the concept’s implicit mixture of facts and opinions.⁶ While some elements can be scientifically evaluated, for Jan Bebbington and Carlos Larrinaga, the political discourse about human attitudes and actions raises serious questions. From an ontological perspective, a difference in approach exists between social and natural systems.⁷ While elements of ecological sustainability can be scientifically based, measuring social sustainability is often more uncertain. Therefore, the degree of equilibrium needed for making decisions renders it difficult to establish a consensus on sustainable practices. The accounting of carbon emissions is a perfect illustration of this

⁴ Johan Rockström, Will Steffen et al., “A Safe Operating Space for Humanity,” *Nature* 461.7263 (2009): 472–5; Johan Rockström, Will Steffen et al., “Planetary Boundaries: Exploring a Safe Operating Space for Humanity,” *Ecology and Society* 14.2 (2009): 32; Will Steffen, Katherine Richardson et al., “Planetary Boundaries: Guiding Human Development on a Changing Planet,” *Science* 347.6223 (2015): 736–46.

⁵ Steffen et al., “Planetary Boundaries,” 741.

⁶ Colin Williams and Andrew Millington, “The Diverse and Contested Meanings of Sustainable Development,” *The Geographical Journal* 170 (2004): 100.

⁷ Jan Bebbington and Carlos Larrinaga, “Accounting and Sustainable Development: An Exploration,” *Accounting, Organizations and Society* 39 (2014): 396.

kind of debate. How important is the reduction of carbon emissions in relation to other contributing factors with regard to global warming? How is one to balance the needed reductions in emissions with the maintenance of a particular lifestyle?

Sustainable development is confronted with two difficulties: on the one hand, a lack of sufficient knowledge concerning the functioning of natural ecosystems and, on the other hand, the question of how to deal with its multiple “framings” in the social field. With regard to the first problem, how do we grasp the multiple layers of causation in dynamic and complex systems?⁸ A good example of the second problem of “framing” is farmers’ understanding of sustainable practices.⁹ On the normative level, farmers’ views on sustainability perfectly illustrate their longstanding “lingering disagreement” about the usual understanding of sustainability.¹⁰ It illustrates that sustainability is also about values, goals, and interests “that determine which of these dynamics are important and worth monitoring.”¹¹ Recent research of Zachary Piso et al. came to the conclusion that farmers consider eight sustainability values as important, presented in order of priority: “economic efficiency, community connectedness, stewardship, justice, ecologism, self-reliance, preservationism and health.”¹² The authors can only conclude that there are competing views on sustainable agricultural production systems. Finally, the choice for dominating values will be the result of democratic deliberation.¹³ Narratives of stewardship, seen from the resilience of farmers’ views on ecology as co-constitutive of their identity,¹⁴ do not exclude instrumentalizing relationships between livestock and farmers, as Ellis suggests.¹⁵ The tension between ecologism, characterized as ecological resilience at a farm level, and preservationism (using native seeds, local breeds, etc.) could even end up in a discussion about sustainability, which “requires protecting ecosystems *from* agriculture”; it could also lead to the valorization of humanly shaped fauna and flora that have been affected by farming practices, viewing these as “the nature that needs to be preserved.”¹⁶

This discussion raises an epistemological question concerning the multi- and interdisciplinary approach of sustainable development: a new approach would require a plurality of perspectives on what counts as sustainability instead of a single disciplinary approach.¹⁷ The understanding of sustainable development as

⁸ Bryan Norton, *Sustainability: A Philosophy of Adaptive Ecosystem Management* (Chicago: University of Chicago Press, 2005), 136.

⁹ Rodrigo Lozano, “Envisioning Sustainability Three-Dimensionally,” *Journal of Cleaner Production* 16.17 (2005): 1838–46.

¹⁰ See Paul Thompson, *The Agrarian Vision. Sustainability and Environmental Ethics* (Lexington: University of Kentucky Press, 2010); Lucas Seghezze, “The Five Dimensions of Sustainability,” *Environmental Politics* 18.4 (2009): 539–56.

¹¹ Norton, *Sustainability*, 136.

¹² Zachary Piso et al., “Sustainability of What? Recognizing the Diverse Values that Sustainable Agriculture Works to Sustain,” *Environmental Values* 25 (2016): 195–214.

¹³ Ian Werkheiser and Zachary Piso, “People Work to Sustain Systems: A Framework for Understanding Sustainability,” *Journal of Water Resources Planning and Management* 141.12 (2015).

¹⁴ Piso et al., “Sustainability,” 211.

¹⁵ Colter Ellis, “The Symbiotic Ideology: Stewardship, Husbandry, and Dominion in Beef Production,” *Rural Sociology* 78.4 (2013): 429–49, 445–6.

¹⁶ Paul Thompson, *From Field to Fork: Food Ethics for Everyone* (Oxford: Oxford University Press, 2015), 161.

¹⁷ Piso et al., “Sustainability,” 196.

an interplay between economic, social, and ecological dimensions has become increasingly debated. Do we have to see these as three distinct categories or do they overlap? Could we equate sustainability with the intersection of the three? And in the case of sustainable agriculture, do we necessarily have to agree with the farmers' understanding of sustainability, which gives priority to economic efficiency over community connectedness and self-reliance over health? In other words, what counts as sustainability? Aren't views on sustainable socio-ecological systems "always contingent on the particular values and goals of individuals and communities"?¹⁸

The Anthropocene and agriculture

The designation of our era as the Anthropocene, described as a time in which "human actions have become the main driver of global environmental change,"¹⁹ suggests that the Earth has become a less hospitable place for human beings. The framework of the Anthropocene focuses on the fact that the human impact on the planet's life-support systems caused a loss of ecosystem services to such an extent that it now threatens human well-being. Chemical engineer and Nobel laureate for chemistry Paul Crutzen and biologist Eugene Stoermer conceived this notion of the Anthropocene, which symbolizes the increasingly intense impact of human activities on the Earth after the period following the Holocene (itself a term introduced by Charles Lyell in 1833 for the post-glacial period of the last 10 to 12,000 years).²⁰ As Will Steffen et al. state: "The human enterprise has shown so dramatically since the mid-20th century ... that the relatively stable, 11,700-year-long Holocene epoch, the only state of the planet that we know for certain can support contemporary human societies, is now being destabilized ... In fact, a new geological epoch, the Anthropocene, has been proposed."²¹ In their 2000 *Nature* article, Crutzen and Stoermer refer explicitly to the French Jesuit paleontologist Pierre Teilhard de Chardin who inspired them, together with the mathematician and philosopher Edouard Le Roy (disciple and successor of Henri Bergson at the Collège de France) and the Russian geochemist Vladimir Vernadsky.²² With the notion of the "noosphere," they describe the growing role of the human mind, which gradually shapes its own world and future through technological innovations.

After the first industrial developments, the human impact (or rather that of "civilized man," as Will Steffen notes) became so large that it affected physical living conditions. Crutzen and Stoermer refer to the main anthropogenic causes of the climate crisis: population growth, growth of livestock, urbanization, fossil fuels, land use, fertilizers, emissions of N₂O, CH₄, and CO₂, dwindling water supplies, deforestation, and so on.

¹⁸ *Ibid.*, 211–12.

¹⁹ Rockström et al., "Safe Operating Space," 472.

²⁰ Paul Crutzen and Eugene Stoermer, "The 'Anthropocene,'" *The International Geosphere-Biosphere Programme (IGBP) Newsletter* 41 (2000): 17–18.

²¹ Steffen et al., "Planetary Boundaries," 736. See also Will Steffen and Mark Stafford Smith, "Planetary Boundaries, Equity and Global Sustainability: Why Wealthy Countries Could Benefit from More Equity," *Current Opinion in Environmental Sustainability* 5 (2013): 404.

²² Paul Crutzen, "Anthropocene Man," *Nature* 467.7317 (2010): 2010; Will Steffen, Asa Persson et al., "The Anthropocene: From Global Change to Planetary Stewardship," *Ambio* 40 (2011), 739.

Therefore, they conclude, “Considering these and many other major and still growing impacts of human activities on earth and atmosphere, and at all, including global, scales, it seems to us more than appropriate to emphasize the central role of mankind in geology and ecology by proposing to use the term ‘anthropocene’ for the current geological epoch.”²³ The question is a pressing one: was it not unwise to move the earth system away from the conditions of the Holocene?

What has previously been designated by the anthropological description of man as *homo faber*, *homo consumens*, etc., is now rather negatively interpreted. A major driving force for this is the increase of world population since 1700, from 600 million to over 7.48 billion today. Fortunately, food production has more than kept pace. Per capita today we not only have much more food than 300 years ago, we now produce more than enough food to feed the global population, a situation that is unique in human history. This spectacular increase in food production can be attributed to several factors: the introduction of new and more productive varieties, improved cultivation techniques made possible by fertilization, crop protection agents (herbicides and pesticides) and mechanization, and the increase of the amount of land available for agriculture.

A first important transformation that explains the increase in production is the general application of fertilizer. Many centuries ago, mainly manure and organic components were used in agriculture. Due to their limited availability, productivity could only increase very little. This has changed with the discovery and widespread use of fertilizers. The vast majority of nitrogen fertilizers are synthesized from nitrogen in the air, but phosphorus fertilizers are mainly mined. The use of fertilizers led to a drastic increase in revenue. The downside is well known: overfertilization and the resulting pollution of surface and groundwater. From a sustainability viewpoint, the optimization of fertilization techniques is a real challenge in order to avoid overfertilization and environmental pollution. Wannes Keulemans et al. mention that this could be done, for instance, by aligning the fertilization to the nutritive need of the crop and its changing needs over time.²⁴

Variety enhancement through selective crossing, wherein the genetic properties of plants and animals are improved, is another factor explaining the increase in production. Eugenics led to high increases in yield per hectare for corn and grains and a drastic increase in the sugar content of sugar beets. Agricultural productivity evolved, as did the area used for agriculture. The surface area for agriculture has increased from around 400 million hectares in 1700, of which 200 million were for crop production and 200 million for grass and grazing land, to around 4,750 million hectares today, of which 1,750 million are for crop production and 3,000 million are for livestock. This 4,750 million hectares represents 28 percent of the Earth’s surface²⁵; this is more than a tenfold increase, with a shift to meadows and pastures for livestock.

About 40 percent of the acreage of grain crops is used for the production of animal feed, which is due to low feed conversion in livestock—an animal has to digest a large amount of food to rise one kilo of body weight. This is much less efficient than

²³ Crutzen and Stoermer, “Anthropocene,” 17.

²⁴ Wannes Keulemans et al., *Voedselproductie en voedselzekerheid: de onvolmaakte waarheid* (Leuven: Metaforum Visietekst, 2015), 14, 23.

²⁵ *Ibid.*, 19.

direct human consumption. Predictions indicate that we can expect a doubling of meat consumption between 2010 and 2050, mainly due to the changing diet of the Chinese. It is obvious that this area of land is not available. Therefore, it is not only the debate about the sustainability of livestock production and meat consumption that is important, but also competition for land needed for human food purposes and producing animal feed.

Feeding the world without eating it: Planetary boundaries at work

Not all effects of these changes are positive. The negative impacts on the environment, the landscape, and animal welfare (among other things) turned out to be significant, and the scale of industrial farming and food processing raises fundamental questions.

The global agricultural system places a significant burden on the use of natural resources. Agriculture and food make a disproportionately large contribution to greenhouse gas emissions.²⁶ Our food system is directly (production) and indirectly (transport, processing) accountable for about one-third of total greenhouse gas emissions. Agriculture uses most of the water that humankind withdraws from the natural cycle (irrigation) and is responsible for a very significant distortion of the nitrogen and phosphorus cycle with significant pollution as a result. This is the reverse of the spectacular food production increase of the last fifty years. To meet the challenges of the future, with healthy food to feed at least 9.5 billion people by 2050, a hyper-efficient food chain is needed, while at the same time respecting the carrying capacity of our planet Earth.

In what follows, five themes will be discussed against the background of the planetary boundaries framework: land use, soil, nutrients, water and, finally, energy and greenhouse gas emissions.²⁷

Land use

Agriculture has been for centuries the human activity with the largest impact on ecosystems, in particular through patterns of land-system changes. The major part of Central and Western Europe was gradually deforested in the Middle Ages for agricultural purposes (including firewood and wood processing). A similar scenario played out much later in the other cradles of agriculture, China and India. In the nineteenth century, European settlers went to North America and cut down the bulk of the natural forest in less than a century (between 1850 and 1920). Many parts of Africa, South America, and Asia rapidly lost forest and woodlands from about 1950. Forests

²⁶ Francesco Tubiello et al., "The FAOSTAT Database of GHG Emissions from Agriculture," *Environmental Research Letters* 8.1 (2013); Francesco Tubiello et al., "The Contribution of Agriculture, Forestry and Other Land Use Activities to Global Warming, 1990–2012," *Global Change Biology* 21.7 (2015): 2655.

²⁷ Cf. Gidon Eshel, Alon Shepon, Tamar Makov, and Ron Milo, "Land, Irrigation Water, Greenhouse Gas, and Reactive Nitrogen Burdens of Meat, Eggs, and Dairy Production in the United States," *PNAS* 111.33 (2014): 1996–2001.

gave way to agriculture; swamps were drained, and natural grasslands were either partially converted to cropland or used as grazing land. In about 150 years, the Earth's surface totally changed. In many places, natural vegetation has now been replaced almost completely by agriculture. Advancing urbanization and the construction of transport infrastructure has completed this picture. Currently, we are using all together about 15 million square kilometers of arable land and about 30 million square kilometers of grazing land. This is a very large portion of the total land area of 130 million square kilometers. Somewhat surprisingly, the Earth still has 40 million square kilometers of forest, which is about 70 percent of the original forest cover.²⁸

The tropical forest decreased annually by 16 million hectares from 1990 to 2000, which is 0.3 percent of current agricultural acreage, and by 13 million hectares between 2000 and 2010. The decline of rainforest in Brazil alone is still around 0.625 million hectares in 2011. The boundary used for land-system change by Will Steffen et al. focuses on biogeophysical processes that regulate climate. The control variable they propose is the amount of forest cover remaining. They call for particular attention to the fact that tropical forests “have substantial feedbacks to climate through changes in evapotranspiration when they are converted to non-forested systems.”²⁹

While for sustainability reasons on a global scale deforestation should stop, the pressure on land available will further increase.³⁰ This means that the efficiency of agricultural production must improve in order to continue to feed a growing world population.

Soil

Agricultural production requires fertile soil that can hold sufficient water, provide sufficient space for the growth of plant roots, and deliver and retain nutrients, without being toxic to plant growth.³¹ The Greeks and Romans recognized the importance of fertile soil. Ancient civilizations often developed sophisticated systems to maintain and to improve soil fertility. They employed crop rotation and fertilized fields with manure, sometimes mixed with turf. From an environmental viewpoint, they were durable, but they did not have high yields, partly because the amount of available nutrients was ultimately limited. There was—and still is on smaller farms in many developing countries—not enough manure available to adequately fertilize large areas. Nowadays, soil fertility is maintained in the most productive areas in the world by the use of fertilizers.

²⁸ Navin Ramankutty, Amato Evan, Chad Monfreda and Jonathan Foley, “Farming the Planet: 1. Geographic Distribution of Global Agricultural Lands in the Year 2000,” *Global Biogeochemical Cycles* (2008): 22; Navin Ramankutty and Oliver Coomes, “Land-use Regime Shifts: An Analytical Framework and Agenda for Future Land-use Research,” *Ecology and Society* 21.2 (2016): 1; Theo Niewold et al., “Global Effects of Land Use on Local Terrestrial Biodiversity,” *Nature* 520 (2015): 45–50.

²⁹ Steffen et al., “Planetary Boundaries,” 742.

³⁰ Olivier De Schutter, “Access to Land and the Right to Food,” Report of the Special Rapporteur on the right to food presented at the 65th General Assembly of the United Nations [A/65/281], October 21, 2010.

³¹ David Powlson et al., “Soil Management in Relation to Sustainable Agriculture and Ecosystem Services,” *Food Policy* 36 (2011): S72–S87.

The main global threat for soil is erosion.³² Water and wind can easily wash out or blow away the fine soil particles when the soil is uncovered. The most realistic estimates are that each year 25 to 40 billion tons of soil is eroded by water.³³ In the long term, this affects the ability of the soil to store water and release it to plants in drier periods. In the short term, the loss of nutrients that erosion involves is a particular threat to agricultural productivity.

Nutrients

In order for plants to grow, in addition to sunlight and water, plants need fertilizers. The three main nutrients are nitrogen (N), phosphorus (P), and potassium (K). The first nutrient source for the plant is recycled: the nutrients present in crop residues such as straw can be reused by plants, provided crop residues remain on the field and conditions are present for the complex organic compounds that hold the nutrients to release them so that they become available again for the plants. Administering animal fertilizers is also a form of recycling. Most of the nutrients have been absorbed by the animal and can be recovered through their droppings. Recycling is important and covers approximately 28 percent of the total global phosphorus requirement.³⁴ Nutrients leak out of the system—through erosion, consumption, and wastewater—and so they have to be (partially) replaced.

Nitrogen can also be introduced into the soil through natural nitrogen fixation by a specialized group of prokaryotes (single-celled organisms without a nucleus).³⁵ Some of these live freely in the soil (cyanobacteria), but the main group are bacteria that live in symbiosis with plants. In exchange for the supplied nitrogen supply, the plant bacteria produce carbohydrates for their energy supply. The most well known is *Rhizobium*, which mainly forms symbiosis with legumes such as peas.

The third source of nitrogen is the industrial production of ammonium (NH_3) via the Haber-Bosch process. Industrial nitrogen production is without doubt one of the most important factors in explaining the huge yield increases in agriculture since around 1930.³⁶ At present, there are approximately 120 million tons of this nitrogen equivalent produced by industrial means, making it possible to continue to feed a rapidly increasing world population. However, there are significant costs. Industrial fertilizer production is very energy intensive and leads to significant CO_2 emissions.³⁷

³² Annemie Leys, Gerard Govers, Katleen Gillijns, Els Berckmoes, and Ingrid Takken, "Scale Effects on Runoff and Erosion Losses from Arable Land under Conservation and Conventional Tillage: The Role of Residue Cover," *Journal of Hydrology* 390.3–4 (2010): 143–54.

³³ Gerard Govers, Kristof Van Oost, and Zhengang Wang, "Scratching the Critical Zone: The Global Footprint of Agricultural Soil Erosion," *Procedia Earth and Planetary Science* 10 (2014): 314.

³⁴ Sheida Sattari, Alexander Bouwman, Ken Giller, and Martin Van Ittersum, "Residual Soil Phosphorus as the Missing Piece in the Global Phosphorus Crisis Puzzle," *Proceedings of the National Academy of Sciences* 109.16 (2012): 6348–53.

³⁵ G. Philip Robertson and Peter Vitousek, "Nitrogen in Agriculture: Balancing the Cost of an Essential Resource," *Annual Review of Environment and Resources* 34 (2009): 97–125.

³⁶ Ismail Cakmak, "Plant Nutrition Research: Priorities to Meet Human Needs for Food in Sustainable Ways," paper presented at *Progress in Plant Nutrition: Plenary Lectures of the XIV International Plant Nutrition Colloquium* (Dordrecht: Springer, 2002).

³⁷ Powlson, "Soil Management," 72–87.

Furthermore, not all dissolved nitrogen is absorbed by plants because nitrogen in the soil is very mobile and is flushed rapidly by rain, and also because of the tendency to overfertilize. In cases of overfertilization, the leached nitrogen leads to algae blooms and creates anoxic zones, for instance, in lakes and oceans.³⁸

Phosphor, required by plants, is derived from phosphorus-containing minerals in the soil (such as apatite).³⁹ In most cases, local weathering cannot cover the full phosphorus needs of agricultural crops. The additional phosphor is administered as a fertilizer, which is produced by mining phosphate-rich rocks and treating them with acids. Each year, approximately 18 million tons of phosphorus is needed as fertilizer.⁴⁰ A large portion of it remains in the soil, bound to the clay minerals and the organic matter that are present in the soil.⁴¹ Furthermore, a lot of phosphorus is lost by erosion.

The fact that phosphorus is mined means that our agricultural system is based on a finite resource.⁴² In the last decade, the so-called phosphorus crisis has been strongly debated, suggesting that geological reserves are becoming exhausted.⁴³ However, it is very difficult to predict when that would happen, even if we are in a “business-as-usual” scenario. The main reason for this is the fact that it is difficult to estimate accurately the phosphate reserves.

Potassium is the third macronutrient. It is abundantly available, usually in the form of potassium chloride, and can be used as a fertilizer in different forms. Potassium is easily soluble in water and therefore, like nitrogen, can be easily rinsed out. The negative environmental effects of potassium are much more limited than these of nitrogen. Globally, we extract per year approximately 31 million tons of potassium. The reserves of potassium are very large. At least 8,000 billion tons of potassium salts are commercially exploitable. No scarcity in the medium term is expected.⁴⁴ In addition to these nutrients, secondary macro- and micronutrients—calcium, sulfur, and magnesium, as well as a number of metals such as zinc, copper, and nickel—are also important for plant development.

The boundary proposed for N, based on the most stringent water quality criterion, allows for a maximum eutrophication of aquatic ecosystems of 62 Tg N/year from intentional biological N fixation.⁴⁵ For the P component, a two-level approach is used. The proposed boundary is set at a flow of 11 Tg P/year from freshwater systems into the ocean. An additional P boundary at the regional level is proposed in order to prevent eutrophication of freshwater systems at a level of 6.2 Tg P/year. Will Steffen et al. conclude that these boundaries are transgressed in a rather significant way in

³⁸ Robertson and Vitousek, “Nitrogen in Agriculture,” 97–125.

³⁹ Tobias Ceulemans et al., “Soil Phosphorus Constrains Biodiversity across European Grasslands,” *Global Change Biology* 20.12 (2014): 3814–22; Tina-Simone Neset and Dana Cordell, “Global Phosphorus Scarcity: Identifying Synergies for a Sustainable Future,” *Journal of the Science of Food and Agriculture* 92.1 (2012): 2–6.

⁴⁰ Sattari, “Residual Soil Phosphorus,” 6348–53.

⁴¹ Keulemans, *Voedselproductie*, 24.

⁴² Detlef Van Vuren, Alexander Bouwman, and Arthur Beusen, “Phosphorous Demand for the 1970–2100 Period: A Scenario Analysis of Resource Depletion,” *Global Environmental Change* 20.3 (2010): 428–39.

⁴³ David Vaccari, “Phosphorus: A Looming Crisis,” *Scientific American* 300.6 (2009): 54–59.

⁴⁴ Keulemans, *Voedselproductie*, 24.

⁴⁵ Steffen et al., “Planetary Boundaries,” 742.

high-productive agricultural zones. For example, they mention that the “current global rate of application of P in fertilizers to croplands is 14.2 Tg/year,”⁴⁶ which has a huge impact on biodiversity on land and sea and has to be linked to another planetary boundary, the acidification of oceans.

Water

Water is used in a variety of ways for human activities. Globally, we can distinguish between “consumptive use” (e.g., drinkable water) and “non-consumptive use” (e.g., cooling nuclear power plants and crop irrigation). Scientists often distinguish between “green” and “blue” water. By “green” water, we mean the water that falls as precipitation on the spot. “Blue” water is extracted from groundwater stores, rivers, or lakes for use in agriculture or industry. Naturally, the use of blue water is much more disturbing to the water cycle than that of green water. Irrigation makes use for the most part of blue water. Petra Doll estimates that we extract from the water cycle about 4,000 km³ blue water annually for all human activities.⁴⁷ This is also the boundary value for Will Steffen et al. About 1,300 km³ is meant for consumers, while agricultural irrigation uses no less than 1,200 km³, with the rest distributed among domestic and industrial uses. Furthermore, there is also a significant loss through evaporation from reservoirs (200 km³). Per year about 40,000 cubic kilometers of water flows off the continents. At first glance, it seems as though there should not be a problem because we use, after all, only 10 percent of available water. Of course, this is a little shortsighted because water is difficult to transport and societies mainly use local resources. Many populated areas are located in places where water is scarce, and the availability of water is already a problem. We must keep in mind that the global demand is likely to increase in the near future.⁴⁸ The capacity of local systems to meet that growing demand is highly variable, but in many semiarid areas, the projected demands will exceed the ability of ecosystems to supply water, partly because of climate change. Vulnerable areas include the southern edge of the Mediterranean, South Africa, and the Midwest of the United States.⁴⁹

The increasing demand for water by agriculture, in combination with reduced availability, will lead to stress situations. At the same time, it is also a major opportunity to optimize the water demand in agriculture, especially in areas where the efficiency of water use still is very low, often with resulting low crop yields. Fully covering agricultural needs, for example, by expanding irrigation systems, is physically impossible. This implies moving production (partly) from areas of low-production efficiency into areas where high-production efficiency can be achieved.

⁴⁶ Ibid., 741.

⁴⁷ Petra Doll, “Vulnerability to the Impact of Climate Change on Renewable Groundwater Resources: A Global-scale Assessment,” *Environmental Research Letters* 4.3 (2009), <http://iopscience.iop.org/article/10.1088/1748-9326/4/3/035006/pdf1-12>.

⁴⁸ Johan Rockström, Mats Lannerstad, and Malin Falkenmark, “Assessing the Water Challenge of a New Green Revolution in Developing Countries,” *Proceedings of the National Academy of Sciences* 104.15 (2007): 6253–60.

⁴⁹ Cf. Asit Biswas and Cecilia Tortajada, *Water Security, Climate Change and Sustainable Development* (Singapore: Springer, 2016).

Energy and greenhouse gas emissions

The global agricultural system is obviously a major energy user. Total energy consumption in agriculture to produce food is estimated at approximately 10 exajoules. While this is significant, it currently accounts for only about 2 percent of total global energy consumption. The entire food sector, including packaging, handling, transport, and storage of food, uses about 95 exajoules, approximately 17 percent of the total global energy supply. Within postproduction, the cooling of food is the major energy user.⁵⁰

The agricultural sector's contribution to greenhouse gas emissions is far more important than its share in global energy consumption (up to 29 percent).⁵¹ These greenhouse gas emissions consist not only of CO₂ released during combustion of biomass or fossil fuels but also of emissions of methane (from cattle, rice production, and manure processing) and emissions of nitrous oxide (N₂O) from soils. These are gases that have a much larger greenhouse effect than CO₂. In other words, food production is responsible for around 20 percent of energy consumption in the agricultural sector, but the share in greenhouse gas emissions of the food chain is around 50 percent. Direct CO₂ emissions associated with the production of nitrogen fertilizer are relatively modest, averaging around 5 percent of the total emissions caused by food production. These emissions are certainly not negligible, but the elimination of fertilizers would lead to a reduction in yields. As a result, more land would need to be used for agriculture, which would result in much larger emissions.⁵²

If we want to achieve a more sustainable agriculture system, we have to become, first and foremost, committed to reducing emissions. In their 2015 article, Steffen et al. indicate that the planetary boundary for CO₂ should be 350 parts per million (ppm).⁵³ They mention a zone of uncertainty from 350 to 450 ppm. The average concentration on annual basis was 399 ppm for 2014. This explains why we are yet experiencing "an increase in the intensity, frequency, and duration of heat waves globally; the number of heavy rainfall events in many regions of the world is increasing; changes in atmospheric circulation patterns have increased drought in some regions of the world; and the rate of combined mass loss from the Greenland and Antarctic ice sheets is increasing."⁵⁴ Having this point in mind, we can then determine the extent to which synergies may also help relieve the pressure of agriculture on other resources.

Sustainable diets

How to move from sustainable food to sustainable diets? Lorenzo Donini et al. mention that there is "an increasing need to develop a holistic view on sustainable food

⁵⁰ Nathan Pelletier et al., "Energy Intensity of Agriculture and Food Systems," *Annual Review of Environment and Resources* 36 (2011): 223–46.

⁵¹ Sonja Vermeulen, Bruve Campbell, and John Ingram, "Climate Change and Food Systems," *Annual Review of Environment and Resources* 3.1 (2012): 195.

⁵² Jennifer Burney, Steven Davis, and David Lobell, "Greenhouse Gas Mitigation by Agricultural Intensification," *Proceedings of the National Academy of Sciences* 107.26 (2010): 12052–57.

⁵³ Steffen et al., "Planetary Boundaries," 738.

⁵⁴ *Ibid.*, 738, 740.

systems, from production to consumption and diets. This can be achieved through linkage to the enhancement of more sustainable dietary models.⁵⁵ The FAO states: “Sustainable diets are those diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources.”⁵⁶ The sustainable diets concept underlines the crucial role of sustainable consumption as a main driver of sustainable food production systems. It is critical vis-à-vis the non-sustainability of current dietary trends because high nutritional quality could not always be associated with low environmental impact.

Figure 10.1 from Keulemans et al. shows a schematic representation of what could be considered as a sustainable diet.⁵⁷ If the entire population would consume such a sustainable diet in accordance with health recommendations, it would have an effect on the production of different foods. A recent study shows that on the basis of present food production and population forecasts, we will not be able to meet the global demand for fruits and vegetables by 2025. Even today the requirements for fruits and vegetables are not met.⁵⁸ The relationship between the quantity available and

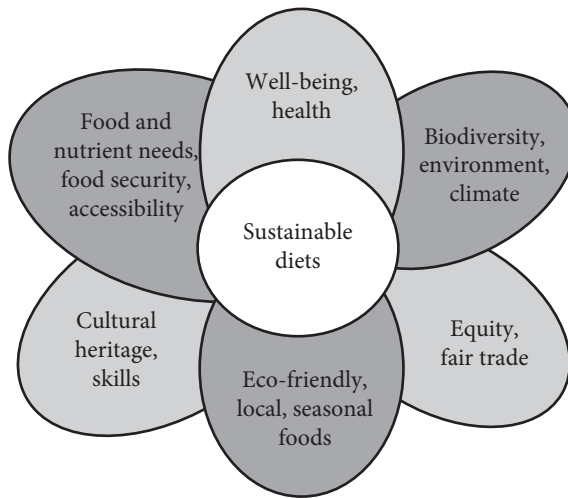


Figure 10.1 A sustainable diet. From Wannes Keulemans et al., *Voedselproductie en voedselzekerheid: de onvolmaakte waarheid*. Leuven: Metaforum Visietekst, 2015.

⁵⁵ Lorenzo Donini et al., “A Consensus Proposal for Nutritional Indicators to Assess the Sustainability of a Healthy Diet: The Mediterranean Diet as a Case Study,” *Frontiers in Nutrition* 3.37 (2016): 1–14, 2.

⁵⁶ FAO, *Sustainable Diets and Biodiversity* (Rome: Food and Agriculture Organization of the United Nations, 2010).

⁵⁷ Keulemans et al., *Voedselproductie*, 45f.

⁵⁸ *Ibid.*, 47.

the needed amount of fruits and vegetables worldwide is at 0.78, but this ratio varies greatly between low-income countries (0.42) and high-income countries (1.02).⁵⁹ In order to meet nutritional recommendations, an increase in the production of fruit and vegetables is needed. The greater need for production, of course, is reflected in the higher need for agricultural land if consumers switch to a healthy and more sustainable diet according to dietary guidelines.

In this context, vegetable products generally have a much lesser environmental impact than animal foods. Beef consumption has a huge impact on natural resources and environment, while milk scores much better. It also depends on the extensiveness and the composition of the animal feed. In general, pig and chicken score much better than beef, while the use of eggs is the least onerous. The impact of cereals, potatoes, and rice, for the same number of calories, is far lower than for animal products, except when one needs irrigation water for the cultivation of potatoes and particularly rice.

In principle, traditional animal protein sources can be replaced by insects. Given the lack of clarity regarding legislation in many countries and the potential risks to public health, human consumption of insects is a much-debated topic. Worldwide, many insects are consumed, though this is not considered a proper diet choice for everyday practice in Western societies. A study conducted in the Netherlands and Australia shows that the introduction of insects as a source of protein is possible, provided that there is sufficient information and/or that people have the chance to taste them.⁶⁰

Challenges related to changing dietary patterns are very diverse. Our diet is associated with more than just the consumption of the necessary energy and nutrients. People often eat because food is tasty, because of stress or boredom, or because there is something to celebrate. The current challenge is therefore: how can we change the diet, accounting for both quality of food and sustainability? Based on the current interpretations and misunderstandings about a sustainable diet, it is clear that more information on a healthy and sustainable diet should be provided to the public. Recent studies show that raising awareness and providing information alone are not sufficient.⁶¹ Changing behavior is possible but requires personal and institutional commitment.

Taxing unhealthy diets goes a step further than health guidelines and creates a political issue in several countries. In October 2011, Denmark became the first country in the world to introduce a “fat tax,” with the aim of reducing the consumption of saturated fats. A year later, however, the tax was dropped. Opponents of the tax—not least the food industry—argue that taxing is not the solution to changing dietary habits. In France in 2012, there was a debate about

⁵⁹ Karen Siegel, Mohammed Ali, Adithi Srinivasiah, Rachel Nugent, and K.M. Venkat Narayan, “Do We Produce Enough Fruits and Vegetables to Meet Global Health Need?” *PLOS ONE* 9.8 (2014): e104059.

⁶⁰ Eveline Lensvelt and Bea Steenbekkers, “Exploring Consumer Acceptance of Entomophagy: A Survey and Experiment in Australia and the Netherlands,” *Ecology of Food and Nutrition* 53.3 (2014): 543–61.

⁶¹ Dave Chokshi and Thomas Farley, “Changing Behaviors to Prevent Non-Communicable Diseases,” *Science* 345.6202 (2014): 1243–44.

the so-called Nutella-tax and a tax on palm oil. Governments are now discussing whether taxes on high-fat snacks, sweets, and sugary drinks are effective to reduce consumption.⁶²

With respect to shifting to a more sustainable diet, one cannot expect that the entire population is ready for change.⁶³ The transition will be a slow process in which external factors play a decisive role. A working group on sustainable diets in the United States concluded that the introduction of a sustainable diet requires many steps at the policy level.⁶⁴ For example, some dietitians believe that combining a tax (for instance, of at least a 20 percent increase for fatty products) with subsidies for fruit and vegetables could be powerful enough to make a difference in the choice of healthy food.⁶⁵

Conclusion

In the introduction, I mentioned that *Laudato Si'* makes use of the “old school” understanding of sustainable development. This explains why the Roman Catholic Church’s encyclical mainly ignores the many interesting discussions that have recently been taking place, such as the impact of meat eating on land-system change. Although *Laudato Si'* has a lot of critique for the market economy, even in a way that “weak” sustainable development models do not, it lacks a more coherent framework to tackle the anthropogenic perturbations of the earth system because of its traditional “weak” sustainability vision. The encyclical does not give priority to the biosphere as a starting point for further reflection. The same objection is valid with regard to the Church’s discourse on “integral ecology.” Apart from whether or not “integral ecology” should be understood as a synonym for “sustainable development,” the critique is roughly the same.

Yet observable effects of the human pressure on earth system functioning show the deficit of a traditional “weak” understanding of sustainable development. The planetary boundaries framework interprets sustainable development differently. The proposed approach for sustainable development considers the stable functioning of the earth system a precondition for social and economic sustainability. Respecting the biophysical limits of the Earth is urgently needed in order to be able to achieve other targets, such as the provision of clean drinkable water and an adequate supply of food. However, the planetary boundaries framework “does not suggest how to maneuver within the safe operating space in the quest for global sustainability.”⁶⁶ Issues of equity, for example, the unevenly caused current levels of transgression of boundaries and

⁶² Keulemans et al., *Voedselproductie*, 48.

⁶³ Joop De Boer, Hanna Schösler, and Harry Aiking, “‘Meatless Days’ or ‘Less but Better’? Exploring Strategies to Adapt Western Meat Consumption to Health and Sustainability Challenges,” *Appetite* 76 (2014): 120–28.

⁶⁴ Sustainable Diets Workshop: IOM (Institute of Medicine), *Sustainable Diets: Food for Healthy People and a Healthy Planet* (Washington, DC: The National Academies Press, 2014).

⁶⁵ Dariush Mozaffarian, Kenneth Rogoff, and David Ludwig, “The Real Cost of Food: Can Taxes and Subsidies Improve Public Health?” *Journal of the American Medical Association (JAMA)* 312.9 (2014): 889–90.

⁶⁶ Steffen et al., “Planetary Boundaries,” 743.

the accordingly unevenly distributed wealth benefits, are not addressed. Let this be a crucial contribution to *Laudato Si'* in which the inequity in causation and effects of climate change among countries is heavily criticized.

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Part Four

Practice

Restoration and Transformation: A Theological Engagement with Ecological Restoration

Rebecca Artinian-Kaiser

Our planetary context of acute environmental degradation is the context in which we find ourselves in the early twenty-first century. The great moral challenge, I would argue, is to find avenues of action that respond to the environmental realities of particular contexts in ways that also have integrity for their human inhabitants, with their social, cultural, historical, economic, religious, and environmental ties. Addressing such a complex challenge requires equally complex, nuanced, and multipronged approaches; this, I believe, requires a meeting of academic disciplines across the natural sciences, social sciences, and humanities, which is a key assertion of this book. While developing more complex, multidisciplinary methodologies to address the complexity of the environmental crisis will be important, I want to focus in this chapter on one particular environmental practice—ecological restoration—that has positioned itself to engage multiple disciplines in an effort to ameliorate the degradation of the ecosystems that sustain us. One realm of knowledge that has received little explicit attention in restoration discussions is Christian theology and ethics (which has similarly ignored restoration). Though this omission is hardly surprising, it is an engagement that I believe could be particularly fruitful for navigating some of the complex moral tensions within ecological restoration.

As a practice oriented to restoring degraded ecosystems to a preferable, past condition, there is a tension surrounding the goals of restoration (should restoration be oriented to the past or to the future of an ecosystem?) and thus also the role of the human person (should her action be limited by the strictures of the previous condition or should she be freed to experiment with new configurations of species in an age of rapid change?). In this chapter, I will explore how Christian theology and ethics, with its central focus on the redemption of the world in Christ, can offer a way to navigate this tension that recognizes the value of what was *and* opens up to creative responses to the novel challenges that face us. In the first section, I briefly explore the practice of ecological restoration, highlighting its holistic approach to restoring degraded landscapes. In section two, I introduce the moral significance of the role of history for guiding environmental action through restoration. Finally, in the third section, I draw on the work of Christian ethicist Oliver O'Donovan to outline parameters for moral

action in contexts of restoration that offer a moral limit on action in nature, while at the same time granting freedom to the moral agent to creatively respond to present challenges with wisdom and love.¹

Ecological restoration

What is ecological restoration? Simply defined, it is “the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed.”² In reality, it is a complex suite of practices encompassing wide-ranging ecological goals and techniques corresponding to a diversity of degraded environments—from wilderness areas, coral reefs, and forests to farmland, landfills, disused mines, and military bases to urban parks, rivers, and corporate green spaces. This varied practice relies upon the field of restoration ecology, which utilizes the scientific tools of ecology to address the problems of degradation wherever they may be found.³ But ecological restoration is a broader category than restoration ecology with wider aims than the restoration of ecosystems by technical means, though scientific methods will always remain a central feature. For instance, some restoration proponents suggest that the practice should examine the dimensions of politics, economics, cultures, and the human and natural sciences in any restoration context.⁴ This claim for a multifaceted and multidisciplinary approach in ecological restoration recognizes the complexity of human engagement with landscapes over time, which cannot be explained or explored solely from the perspective of the discipline of ecology.

This holistic approach to landscape restoration extends into the realms of meaning and morality such that some restorationists have suggested that restoration practices have the potential to restore human relationships with their environments, as well as the ecosystems themselves.⁵ The time-consuming and laborious work of restoration is seen as a potential training ground for environmental responsibility where people can witness firsthand the effects of their lifestyles on the environment, get to know their local environments, and learn to cultivate the kinds of values and behaviors that will protect that environment from further harm.⁶ As Stuart Allison writes, “restoration must result in a deep personal and cultural engagement with the environment or it will not achieve much beyond a temporary patch for the landscape.”⁷ This is also why

¹ Many of the ideas explored in this chapter are treated in greater depth in Rebecca Artinian-Kaiser, “The Resurrection and Restoration of Nature: Towards a Theological Framework for Christian Environmental Action through Ecological Restoration” (University of Chester, 2015).

² *The SER International Primer on Ecological Restoration* (Tucson: SER, 2004), 3.

³ Andre Clewell and James Aronson, *Ecological Restoration: Principles, Values, and Structure of an Emerging Profession* (Washington, DC: Island Press, 2013), 200.

⁴ Eric Higgs, “The Two-Culture Problem: Ecological Restoration and the Integration of Knowledge,” *Restoration Ecology* 13.1 (2005): 159.

⁵ Stuart Allison, “What Do We Mean When We Talk about Ecological Restoration?” *Ecological Restoration* 22.4 (2004): 285.

⁶ Andrew Light, “Ethics and Ecological Restoration,” in *Healing Nature, Repairing Relationships: Landscape Architecture and the Restoration of Ecological Spaces*, (ed.) R. France (Cambridge, MA: MIT Press, 2004), 10.

⁷ Allison, “What Do We Mean,” 285.

some have argued for public participation in restoration so that the maximum societal and personal benefits may be realized.⁸ The importance of this dimension is evident in restoration contexts where ecologists have gone about the scientific task of restoration without factoring in wider societal concerns. While people are seldom opposed to the *idea* of restoring local ecosystems, they may be resistant to the trade-offs involved or the methods of restoration. For example, restoration may require restricting dog access to protect ground-nesting birds, the eradication of trees connected to local memories of place, the recreation of ecosystems deemed less aesthetically pleasing,⁹ or the use of control methods for non-native species that may be upsetting to the public.¹⁰ Public participation early on and throughout the process may help to head off the kinds of backlash that ecologists often face, as well as alert them to important cultural dynamics that will determine the ultimate success of the project. Although public participation in the decision-making process may considerably slow down the restoration process, the benefits of public involvement may outweigh these costs in other ways as well. For example, volunteers have played a key role in increasing scientific knowledge of local ecosystem processes over time and, in some cases, are on the leading edge of that knowledge.¹¹ Moreover, given the diversity of contexts, local volunteers committed to place can be important repositories of wisdom about what will work politically, ecologically, culturally, and so on.

Retaining an emphasis on public participation in restoration is a key aspect of maintaining its wider focus, and it is also what makes it particularly ripe for theological reflection and engagement. Restoration may be practiced by anyone in a back garden, church green space, park, local watershed, abandoned city plot, or former gas station. And for those engaged in the work, it frequently leads to deeper questions about the natural world, the human place within it, and the nature of right action, questions that are often couched in religious language in restoration literature. Restoration writings are uniquely peppered with references to ecological restoration as “redemption” and “absolution,”¹² “expiation” and “atonement,”¹³ “resurrection,”¹⁴ and “healing,”¹⁵ and environmental exploitation as “sin.”¹⁶ This language reinforces the assertion that restoration is more than just the scientific practice of restoring ecosystems. Eric Higgs writes,

⁸ Eric Higgs, “What Is Good Ecological Restoration?” *Conservation Biology* 11.2 (1997): 338–48.

⁹ Paul Gobster, “Restoring Nature: Human Actions, Interactions, and Reactions,” in *Restoring Nature*, (eds.) Paul Gobster and R. Bruce Hall (Washington, DC: Island Press, 2000).

¹⁰ On the ethics of eradication, see Jo-Anne Shelton, “Killing Animals That Don’t Fit In: Moral Dimensions of Habitat Restoration,” *Between the Species* 13.4 (2004); Roger King, “Feral Animals and the Restoration of Nature,” *Between the Species* 9 (2009): 1–27; David Strohmaier, “The Ethics of Prescribed Fire: A Notable Silence,” *Ecological Restoration* 18.1 (2000): 5–9.

¹¹ Dean Apostol, “Ecological Restoration,” in *Restoring the Northwest*, (eds.) Dean Apostol and Marcia Sinclair (Washington, DC: Island Press, 2006), 11.

¹² Higgs, “Good Ecological Restoration,” 342; Eric Higgs, *Nature by Design* (Cambridge, MA: MIT Press, 2003), 215.

¹³ Andre Clewell and James Aronson, “Motivations for the Restoration of Ecosystems,” *Conservation Biology* 20.2 (2006): 423.

¹⁴ William Jordan, “Restoration, Community, and Wilderness,” in *Restoring Nature*, (eds.) Paul Gobster and R. Bruce Hull (Washington, DC: Island Press, 2000), 34.

¹⁵ Higgs, “The Two-Culture Problem,” 215.

¹⁶ Richard Sylvan, “Mucking with Nature,” in *Applied Ethics in a Troubled World*, (eds.) Edgar Morscher, Otto Neumaier, and Peter Simons (Dordrecht: Kluwer Academic, 1998), 80.

Restoration offers a redemptive opportunity. We heal ourselves culturally, and perhaps spiritually, by healing nature. (To carry the biblical image further, in redemption there is the possibility of absolution, which provides a strong incentive for action by those racked with guilt over environmental degradation).¹⁷

This foray into religious language on the part of some restorationists, as they attempt to articulate their experience of the deeper significance of the practice, I believe calls out for critical theological reflection on the nature of the human person and her activity in the world, the nature of redemption, and the role of the human moral agent as she navigates the inherent tensions and ambiguities of restoration practice. In the next section, I want to begin to explore these aspects through a central feature of restoration practice, that of its orientation to the past.

The past, present, and future in restoration

Questions about the role of history are not peripheral to the practice of ecological restoration because understandings of the past function in ethically significant ways, influencing what responsible action looks like in any given context. As Higgs writes, “restoration is practiced by people who hold particular values about what counts as an appropriate ecosystem, and this in turn is conditioned by our contemporary and changing views of nature and wilderness.”¹⁸ The influence of these historical/cultural features on a scientific, ecological practice highlights the critical importance of the role of the humanities: for instance, historians can parse through cultural narratives of settlement to bring us to a more realistic picture of the North American environment; scholars of literature can reveal how this narrative is created and reinforced in influential writings; scholars of religion can show how the Judeo-Christian origin myth in the Garden of Eden has shaped perceptions of North America and the work of settlers; and scholars of the visual arts can show how artistic renderings of the North American landscape shape and reinforce cultural assumptions of nature. Each of these disciplines (and more could be named) offers lenses through which to help us understand that the decisions of ecologists engaged in restoration—about what counts as nature, what places are worthy of restoration, what ecosystem configurations represent the most appropriate targets for restoration, which species should be restored or removed—have cultural valences that must be addressed, and that claims to objectivity in ecological science are not convincing. This is not to suggest that we need to find ways to eliminate bias or deconstruct the values of restorationists in an effort to make the practice more objective and scientific. Instead, it is to say that restoration touches on aspects of human existence that science is ill-equipped to address and that a multidisciplinary approach—and here I would argue for drawing on the resources of Christian theology—is crucial for developing how we may live within our planetary limits *and* become an integral part to its flourishing.

¹⁷ Higgs, “Good Ecological Restoration,” 342; Higgs, *Nature by Design*, 215.

¹⁸ Higgs, “Two-Culture Problem,” 162.

As is evident in the language of *re-storation*, a defining feature of ecological restoration is its distinctly historical orientation. In a sense, restoration attempts to return an ecosystem to a previous condition viewed in some way to be better than what currently exists. Of course, decision-making around which ecosystem configurations to privilege and recover is not value neutral but is deeply entwined with cultural values and history. For instance, the goal or baseline of restoration activities is frequently, in North America, set to a point prior to European settlement when ecosystems were deemed more “natural” than current systems. This preference for the pre-European settlement baseline has been heavily influenced, as many restorationists recognize, by an entrenched cultural narrative of nature as “pristine”¹⁹ and of the inherently degrading nature of human activity, assumptions that continue to affect environmental policy today. In this narrative, European settlement, with its practices of land clearing, agriculture, livestock grazing, and fire suppression, disrupted the landscape from its naturally pristine condition, a disruption that is ongoing.²⁰ Of course, this raises interesting questions about the degree of transformation and at what point the incremental changes made by settlers and their descendants become unacceptable in ecological terms.²¹ What is particularly interesting about ecological restoration, however, is that it aims to subvert these narratives and their assumptions about the natural world and the human person even while recognizing their powerful influence on the cultural and environmental (and restorationist) imagination.

Restorationists have pressed against the notion that human activity in nature must be protected against and have suggested that humans can be a positive presence in the world’s ecosystems by fostering and strengthening natural processes in places of degradation. Moreover, they have increasingly highlighted Native American alterations to the land, incorporating positive landscape practices into restoration schemes, and they have also deliberately moved away from outdated ecosystem models—that ecosystems tend toward balance when not disrupted—affirming that change is natural.²² However, if change is key to ecosystem functioning, then it is hard to argue for the value of a static historical environment and the blanket wrongness of changes made by *Homo sapiens*. These shifts have opened up positive space for humans to respond to environmental degradation in ways that move beyond negative calls to minimize our presence on the planet. However, this has also led to concerns that if we give too much space to human creativity in responding to degradation on the basis that all change is natural, then we are opening the door to the possibility of unbridled

¹⁹ See William Denevan, “The Pristine Myth: The Landscape of the Americas in 1492,” *Annals of the Association of American Geographers* 82.3 (1992): 369–85.

²⁰ One implication is that Native American changes to the land are overlooked as impotent compared to the changes of white settlers, revealing an overt racism in the cultural narrative of settlement and what counts as work. See William Cronon, *Changes in the Land: Indians, Colonists, and the Ecology of New England* (New York: Hill and Wang, 1983); Arturo Gomez-Pompa and Andrea Kaus, “Taming the Wilderness Myth,” *BioScience* 42.4 (1992): 271–9; Richard White, “Are You an Environmentalist or Do You Work for a Living?: Work and Nature,” in *Uncommon Ground*, (ed.) William Cronon (New York: W.W. Norton, 1996).

²¹ White, “Are You an Environmentalist,” 175.

²² Daniel Botkin, *Discordant Harmonies: A New Ecology for the Twenty-First Century* (Oxford: Oxford University Press, 1990), 9.

experimentation and the invention of (possibly anthropocentric) landscapes in the name of environmental responsibility.

The specter of climate change, and the resulting rapid changes to ecosystems, has brought these issues to the forefront and challenged the historical emphasis of restoration practice. If we truly are entering an era of accelerating change and unknown consequences, how can restoring to a previous condition be sustainable when species will be driven to extinction or into forced migrations, and ecosystems as they are presently configured will no longer be tenable and would require intensive management to maintain? Although climate change has the potential to be a spoke in the wheel for ecological restoration, restorationists remain steadfast in arguing for the usefulness of the historical limit even in changing ecosystems because of the kinds of values and behaviors this limitation fosters. Without history, we may, as Higgs posits, end up “giving too much to the capricious nature of contemporary judgment.”²³ Untethered from history, restoration goals and projects could become “arbitrary” with the “target landscapes” shifting with the fashions.²⁴ Moreover, the notion of fidelity to the history of an ecosystem provides a check on human hubris and the desire to shape the world to suit human interests. Restorationists work under a self-imposed limitation: they cannot do whatever they would like with an ecosystem but instead must attend closely to every element.²⁵

Attentiveness to the landscape and its historical layers can encourage moral reflection on the ways it has been inhabited and how these ways of being have contributed to both flourishing and degradation.²⁶ This remembering encourages evaluation of the kinds of actions that will be needed to sustain landscapes going forward into new climatic conditions. In navigating this discussion, Higgs balances historical fidelity and change in a nuanced way that avoids diffusing what I believe to be a necessary tension between the past, present, and future in restoration. For him, the past is neither tossed aside as irrelevant for a changing climate nor rigidly clung to. On the one hand, historical baselines continue to be useful in North America because ecosystems “in the past tended to be less grievously affected by human activities than they are today.”²⁷ On the other hand, he recognizes the need to be attentive to the complex interplay of human and ecological factors, balancing a desire to recreate historic ecosystems with present constraining social, economic, political, cultural, aesthetic, and moral concerns, and being ready and open to loosen restoration goals. He strikes an important balance between “the guiding role history plays in recovering ecosystems, and a pragmatism that allows a measure of autonomy for practitioners to work in the present.”²⁸ For Higgs, a more helpful way of thinking about restoration is through the notion of “regeneration,” which better captures the “tentative, developmental quality

²³ Higgs, *Nature by Design*, 131.

²⁴ Marcus Hall, *Earth Repair: A Transatlantic History of Environmental Restoration* (Charlottesville: University of Virginia Press, 2005), 194.

²⁵ See discussion of ecocentric restoration in William Jordan and George Lubick, *Making Nature Whole: A History of Ecological Restoration* (Washington, DC: Island Press, 2011), 4.

²⁶ See Marion Hourdequin and David Havlick (eds.), *Restoring Layered Landscapes: History, Ecology, and Culture* (New York: Oxford University Press, 2016).

²⁷ Higgs, *Nature by Design*, 144.

²⁸ *Ibid.*, 130.

of sensitive human engagements with ecosystems.”²⁹ Even when restorationists aim to be faithful to a historic ecosystem, restoration practice always requires a measure of experimentation and guesswork, since seldom is there sufficient data to recreate a previous ecosystem.

In light of this, what is needed, then, is a way of fleshing out an approach to restoration that is, on the one hand, sufficiently humble and respectful of ecosystems as they have developed and is, on the other hand, alert to the new challenges that face our planet. In the following section, I explore the broad parameters of such an approach through theological reflection on the nature of redemption as a way of holding in tension fidelity to the past of an ecosystem, openness to its future, and a role for humans as we approach our moral contexts of environmental degradation in responsive and creative ways.

Toward a theological approach to restoration

Redemption, as conceived by restorationists, sees returning to the past as a way to bring absolution and healing. But such redemption seems paltry if it does not offer more than an endless return to beginnings and extend hope for transformation and fulfillment. The Christian tradition offers another possibility: that redemption is not something we seize for ourselves through a flurry of righteous activity but rather is a gift that reaches into every corner of life and calls forth from us joyful responses (which could include restoration activity) to the world redeemed and reoriented to its fulfillment.

For Christians, it is God who brings about the redemption of the world through the resurrection of Jesus Christ from the dead. It is a redemption that embraces all creation—human and nonhuman. What is significant for our purposes here is that it maintains an essential tension between past, present, and future realities, even as it reframes the terms of these categories. In his work on Christian ethics *Resurrection and Moral Order*, moral theologian Oliver O’Donovan³⁰ suggests that the resurrection (a) affirms the goodness of creation (as having its own meaning and purpose³¹) and (b) holds forth the promise that “all shall be made alive” one day.³² Thus, through the resurrection, creation is both *restored* and *transformed* so that it does not merely cycle back to what it was but is pointed toward its fulfillment and enlivened in new ways. True restoration must hold forth the promise of transformation, and there can be no transformation without the affirmation of inherent value and goodness.

In the resurrection, God indeed affirms that the goodness of creation—proclaimed by God in Genesis—is not to be overturned but remains of enduring significance to

²⁹ Higgs, “Good Ecological Restoration,” 347.

³⁰ For a more in-depth and critical engagement with O’Donovan’s work, see Artinian-Kaiser, “Resurrection and Restoration of Nature.”

³¹ Oliver O’Donovan, *Resurrection and Moral Order: An Outline for Evangelical Ethics*, 2nd edn. (Leicester: Apollos, 1994), 55.

³² *Ibid.*, 14–15.

God. This continuing commitment to creation has implications for human action in the world. For one, it calls for our moral attentiveness to the natural world, our resistance to what would undermine or degrade it, and our open and creative engagement with it in ways that testify to God's purposes of transformation and fulfillment. For O'Donovan, there is a strong connection between the created order God has affirmed and human moral action: he writes, the "way the universe *is*, determines how [hu]man[s] *ought* to behave ... in it."³³ This compliments an assertion by Holmes Rolston suggesting that in order to know what ought to be done in the natural world, we have to first know "what is the case" both in a scientific and in a metaphysical sense.³⁴ The way the world is, with all its natural meanings and purposes, its entanglements and relations cannot be disregarded as we morally navigate our way through it. This is not to suggest that we can easily move from a recognition of what the universe is to right action in it, but it does reject the idea that the human prerogative is to order and give meaning to the world.³⁵ The natural world is not waiting or dependent on us to bestow its value; it already possesses value worthy of our respect.

In further exploring aspects of redemption's significance for moral action, we cannot do so without turning to a discussion of love. Love, O'Donovan suggests, is the appropriate response to the redemption of the created order and thus is the "overall shape of Christian ethics."³⁶ Through the ministry of God's Spirit, we are invited and enabled to respond to and take part in God's activity in the world. Such love has its eyes wide open to the world God has affirmed and transformed and thus relies heavily on perception. O'Donovan writes, love "achieves its creativity by being perceptive."³⁷ It is a kind of "attitudinal disposition"³⁸ to the world that acts *for* a being only "on the basis of an appreciation *of* that being."³⁹ Appreciation is a way of orienting oneself to the world that takes its cue from God's delight in the goodness of creation. To delight is to rejoice in something, "not wanting to do anything 'with' it."⁴⁰ In delighting in creation, God truly *sees* the creation; it is a moment of intimate knowledge of what it is and an appreciation of its sheer existence.⁴¹ To truly appreciate and delight in something, therefore, requires some understanding of what it is and how it fits into the whole. What this suggests is a relationship in which knowledge and love sit close together.⁴² And it is here that we also brush up against the concept of wisdom, that reaching out to understand the world in all its complexity, connections, and interrelations—a feature that knows no disciplinary boundaries—so that we can begin to comprehend the contours of moral action that responds to the reality of the world. Love drives

³³ *Ibid.*, 17.

³⁴ Holmes Rolston III, "Environmental Ethics: Values in and Duties to the Natural World," in *Ecology, Economics, Ethics: The Broken Circle*, (eds.) F. Herbert Bormann and Stephen Kellert (New Haven: Yale University Press, 1991), xii.

³⁵ O'Donovan, *Resurrection and Moral Order*, 17.

³⁶ *Ibid.*, 24–5.

³⁷ *Ibid.*, 26.

³⁸ Oliver O'Donovan, *Common Objects of Love: Moral Reflection on the Shaping of Community* (Grand Rapids: Eerdmans, 2002), 15.

³⁹ O'Donovan, *Resurrection and Moral Order*, 26.

⁴⁰ O'Donovan, *Common Objects of Love*, 16.

⁴¹ O'Donovan, *Resurrection and Moral Order*, 26.

⁴² See O'Donovan, *Common Objects of Love*, 16.

the search for wisdom, that expansion of thinking that sharpens our perceptions and brings into view features of the moral landscape that we had not previously known to consider.

In an environmental context, wisdom bound up in love attends to the world and recognizes value, even in degraded landscapes, and it calls for entanglement and commitment to knowing a place over time. In most restoration contexts, it will extend beyond the biological to an understanding of the complex relationships between particular environments and their inhabitants—human and nonhuman. Wisdom seeks to understand how communities value and engage with their environments, where there is potential for conflict, who will be most affected by the environmental changes, and what cultural issues might need to be reexamined alongside environmental concerns. Although we are called to move deeper into wisdom, the reality is that the world will remain largely mysterious to us, a reality that makes a strong case for humility in moral action. This does not mean that we refrain from acting because our knowledge is too incomplete to guarantee the right outcome. To perceive the world rightly is to see it in light of its restoration and transformation in Christ. It sees the reality of present brokenness *and* the reality of the promise of fulfillment. Holding these two in tension, it seeks to know how God's spirit may be calling the world out of brokenness and into a new way of being. And it also takes a further step: it asks how we might be called to participate in God's healing work that encompasses all creatures, ourselves included.

Thus far, I have resisted directly correlating acts of restoration with love and God's transformation of the world. This has been deliberate because the issues in play are too complex for such a simplistic leap. Given the diversity of environmental contexts, action may be loving in one place but inappropriate in another. Love behaves toward a place in ways that correspond to its particular context—in all its ecological, historical, political, social, and cultural complexity—and does not treat it as though it were some other place. Moreover, we have to be appropriately cautious when raising the notion of transformation in a redemptive sense, especially regarding human action in the natural world. The possibility is all too likely that the human desire to transform the world to suit human purposes could reappear in restoration in the name of environmental responsibility. It is important to make explicit that humans do not bring about the redemptive transformation of the world; however, we might modestly see a role for human *participation* in God's restoring and transformative action through our creative attentiveness and the extension of natural value. In a restoration context, creativity informed by love would not be about imposing purpose or meaning on a blank-slate landscape; it would be about perceiving meaning and value already present and seeking to skillfully bring it to light in new ways so that it may develop in increasingly rich ways.⁴³ In so doing, it may be that we can “share, by the Spirit, in its outworking.”⁴⁴ However, we always remain ignorant of what it will mean for creation to be redeemed; thus, it would be folly to attempt to transform the world, imposing our own vision

⁴³ See Jeremy Begbie, *Voicing Creation's Praise: Towards a Theology of the Arts* (Edinburgh: T&T Clark, 1991), 209.

⁴⁴ Jeremy Begbie, “Christ and the Cultures: Christianity and the Arts,” in *The Cambridge Companion to Christian Doctrine*, (ed.) Colin Gunton (Cambridge: Cambridge University Press, 1997), 111.

of what fulfillment might look like. Although we ought not to set out to transform through restoration, we might discover that, through our perceptive attentiveness and responsive action, we are caught up in God's transforming work in creation.

Perceptive attentiveness has particular resonance in the environmental context where there is already a precedent for contemplative appreciation in nature writing and in the preservationist approach to environmental protection. In both of these, there is recognition of the intrinsic value of the natural world apart from its usefulness for human purposes. It is also an important element, I would suggest, of restoration practice as well. The ecocentric commitment to return every element to an ecosystem reveals a deep appreciation for the existence of each plant or animal. Moreover, there are resonances with this orientation of appreciation and the preference for the historical baseline in restoration practice. By preferring to restore to a previous condition, restorationists make a statement about the value of the natural world in all its complex relations that was *there* before we got here and turned it toward our purposes.⁴⁵ This *thereness* or "the givenness, strangeness, and otherness of nature"⁴⁶ carries moral weight for restorationists to the extent that they aim to recover this value as much as possible. We might even say that the gift of the restorationist is in seeing value in places of degradation where others see little of worth and in working to bring that value to the forefront once more. And in this, there is another opening for an approach that takes account of the past but opens out to a wider vocation for restoration. Value is not merely that which existed prior to environmental degradation but is always *there* in front of us, calling us to attend to it and bring it to light.

When such attention and respect is given to the natural world in restoration, it becomes possible to talk about creativity and transformation in a new light. Creativity in this context seeks to find new and interesting ways to help us see the complexity and value of this world. It also recognizes the graced nature of the world redeemed and opened to its fulfillment in Christ. The call of love, then, is to respond to the world in ways that creatively bring forth the good so it may be seen for what it is: God's beloved world affirmed and redeemed in the resurrection and awaiting its fulfillment. A theologically informed restoration approach maneuvers its way in a perceptive mode through the ethical and physical challenges posed by a situation, taking account of what is and has been, as well as what could be. It asks how God might be calling us to participate in God's redeeming and transforming purposes for the world, a world in which human and nonhuman creatures flourish with abandon. Again, perceiving how this may be the case requires a wide perspective, a taking in of scientific, cultural, and social realities aided by a multidisciplinary approach that recognizes the need for environmental solutions that acknowledge a wide variety of stakeholders, both human and nonhuman.

And so, the questions posed by this chapter, concerning the role of the past for restoration goals and the role of the human person, retain their essential tension through an engagement with Christian theology. The past is not done away with in the march to transformation; rather, the integrity of the natural world—what it was and is

⁴⁵ Jordan and Lubick, *Making Nature Whole*, 5.

⁴⁶ *Ibid.*

in all its complexity and interrelations—is affirmed as good and worthy of our attention and responsiveness that creatively brings its value to light in new ways. In so doing, the human person may find herself caught up in the transforming work of God, a work that includes her and the world she seeks to love. Indeed, this redemption reaches into the actions of the human person, freeing her to fully inhabit her humanness knowing that God has affirmed her and given her what she needs to creatively respond to the world in wisdom and love. Such a responsive orientation will be particularly important in an age of rapid environmental change when the temptation may be to either artificially recreate the past to fend off the realities of this change or fashion a new world to suit human needs alone.

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Laudato Si' and Standing Rock: Water Justice and Indigenous Ecological Knowledge

Christiana Zenner

The problem of water is partly an educational and cultural issue.

— Pope Francis

Mni wiconi—water is life.

— Lakota saying

In the twenty-first century, freshwater crises and conflicts result from complex intersections of hydrogeology, globalized political economies predicated upon resource extraction, and diverse cultural understandings or social norms regarding the distribution and use of water. This chapter pairs awareness of global freshwater dynamics with Pope Francis's remarks in *Laudato Si'* about freshwater and indigenous cultural value; it places those remarks in conversation with rallying cries for the sacredness of water as articulated by indigenous activists at Standing Rock, North Dakota, who protest the construction of a gas pipeline across their lands and under the Missouri River.¹

The first section of this chapter, "Twenty-first-century water challenges," describes five key water challenges that are becoming more and more prominent worldwide and specifies how the construction of the Dakota Access Pipeline (DAPL) reflects extractive mentalities, legacies of colonialism and the denial of sovereignty to native peoples, and profound cultural disagreements over proper uses of water. The second section, "The Dakota access pipeline, Standing Rock, and *Mni wiconi*," describes how water protectors at Standing Rock make significant moral claims about water- and sovereignty-based indigenous resistance to the pipeline and to the political economies of domination that support it. The third section, "*Laudato Si'*: The value(s) of water

¹ I have written elsewhere about how Pope Francis's remarks in *Laudato Si'* overlap with or are challenged by the Declaration of the Rights of Mother Earth. See Christiana Z. Peppard, "Hydrology, Theology, and *Laudato Si'*," *Theological Studies* 77.2 (June 2016): 416–35.

and a papal turn to indigenous knowledge,” turns to Pope Francis’s developments of Catholic social teaching (CST), summarizing two topics put forward in *Laudato Si’*: normative commitments about water and justice, and epistemic-ethical appeals to indigenous ecological knowledge. The fourth section, “Water justice and indigenous knowledge between *Laudato Si’* and standing rock,” integrates those claims with reference to Standing Rock and concludes that the DAPL project is a prime example of when environmental-ethical values of indigenous peoples should be honored, and the pipeline not constructed, even while recognizing the myriad knots of energy, environmental, and economic considerations at play.²

Twenty-first-century water challenges

This section describes five factors that shape freshwater conflicts worldwide and inform an understanding of how generalizable social-environmental dynamics also shape the current standoff at Standing Rock. What are these general factors? In *The Price of Thirst*, geographer Karen Piper rightly identifies the three problems of “pollution, groundwater loss, and climate change.”³ To these can be added consumptive vs. nonconsumptive use of water, as well as massive infrastructural inequities in an era of economic globalization.

Pollution arises from the contamination of freshwater supply by human waste products (where sanitation systems are insufficiently present and separated from freshwater supply), agricultural effluent, or industrial/manufacturing waste. Negative impacts from pollution tend to be borne most dramatically by people who live in situations of poverty and lack viable, affordable alternatives to contaminated freshwater. Such problems are not limited to developing or industrializing nations; they also apply in industrialized contexts. For example, in the United States, the Standing Rock reservation has among the lowest percentages of access to plumbing in the nation. In urban settings, the revelation of lead in the water in Flint, Michigan, in Newark public schools, and in multiple other underfunded, under-protected, and under-maintained systems puts a painful and proximate point on water as a public health crisis that disproportionately affects populations already made vulnerable by poverty and legacies of structural racism.

Examples of large-scale effluent from manufacturing are legion in the United States and worldwide and are subject to varying degrees of regulation. Extractive industries (especially mining for fossil fuels or minerals) create significant risk for water supplies, whether through toxic mine trailings, contamination of surface and

² Special thanks are joyfully due to Seattle University, where I first articulated normative implications of Pope Francis’s turn to indigenous knowledge in the Catholic Heritage lectures series through the Institute for Catholic Thought and Culture in February 2016; to Barry University for hosting me as their Founder’s Day Distinguished Lecturer in November 2016, where these ideas were further developed; and to Stephen Payne and Meg Stapleton-Smith of Fordham University for stupendous research assistance.

³ Karen Piper, *The Price of Thirst: Global Water Inequality and the Coming Chaos* (Minneapolis: University of Minnesota Press, 2014), 26.

groundwater through pipeline bursts and other leakages, or concern about absorption of chemicals into surface or groundwater. The issue of pipeline leakage and plausible water contamination are major parts of the allied indigenous resistance to the DAPL project, discussed in greater detail in the preceding section.

There is a persistent interaction between groundwater and surface water, which percolates down into the shallow or deep earthen formations known as aquifers. Some shallow aquifers can be quickly replenished in this way, but not all groundwater recharges from surface water at rapid rates. Such sources are termed “fossil water,” indicating that such aquifers do not recharge on humanly meaningful time scales. Instead, when the rate of withdrawal from an aquifer exceeds the rate of recharge, the groundwater level drops; eventually that water source becomes saline, dries up, or can cause land subsidence aboveground due to the changes in underground pressure. These dynamics now occur many places worldwide, from Beijing and Mexico City to the San Joaquin Valley in California and coastal aquifers such as in the Gaza strip or Los Angeles, which face intrusion of seawater that renders freshwater non-potable.

Climate change is a wide-ranging factor in freshwater scarcity and related social conflicts. Driven primarily by the fossil-fuel consumptive habits of a small proportion of the world's population (developed and industrializing nations, including the United States, within which the push to construct DAPL is symptomatic of fossil-fuel dependency), the effects of climate change permeate the world through mechanisms such as water. A warming climate means rapid melt of the highland glaciers that have long sustained freshwater supplies for rivers and their downstream populations. A warming climate also means, more generally, that wet places will get wetter and dry ones will get drier. Neither the causes nor the worst effects of climate change's water-related impacts will be borne evenly, much less justly, by the world's populations: impacts will be felt most dramatically by people living in situations of geographic or socioeconomic vulnerability.

It is crucial to know that water cycles are interwoven with human arrangements of political economy, social structure, and power. The distinction between *consumptive* and *nonconsumptive uses* is another important tool for understanding how hydrology and society intersect. Consumptive use refers to water that is withdrawn from a source and then used up (i.e., “consumed”) in a way that does not return water to the watershed. Agriculture represents a consumptive use of water (since water inputs are transformed into agricultural products such as strawberries, cotton, or beef). By contrast, nonconsumptive use means that water is cycled back into the watershed after being withdrawn. Domestic tasks such as laundry and showers tend to be standard examples of nonconsumptive use. Of course, few uses of water are strictly consumptive or nonconsumptive. For example, some forms of industrial water withdrawals, such as for the cooling of thermoelectric power plants, are returned almost fully to the watershed, but if the water is returned at significantly higher temperatures, that can alter the ecological functioning of the area.

A final key challenge for freshwater has to do with inequities attendant on *infrastructural dimensions of freshwater distribution and access*. An aspect made visible in the Michigan cities of Detroit and Flint is how access to clean water tracks onto socioeconomic class—which in turn often links to legacies of racism or colonialism. So too have Native American communities not only been historically persecuted and

pushed toward cultural extinction in the United States but also their lands and rights to waters have been legally and environmentally compromised for decades, and their sovereignty challenged for generations by governmental agencies or multinational corporations. As such, DAPL provides an apt site for considering how water helps to make visible these structural, legal, and physical disenfranchisements of native peoples' tribal sovereignty and ecological-relational value systems.

The Dakota access pipeline, Standing Rock, and *Mni wiconi*

Following a half century in which Army Corps of Engineers projects dammed and diverted various water sources, the Lakota Sioux of the Standing Rock reservation in North Dakota have for several decades advocated for sufficient access to clean freshwater for their lands and people. In November 2004, a senate hearing convened by the Committee on Indian Affairs was held on objections pertaining to Army Corps of Engineers' diversion of portions of Missouri River tributaries to facilitate barge commerce downstream. While the corps argued for the primacy of economic benefit resulting from increased barge traffic on the Missouri, Standing Rock Sioux chairman Charles Murphy presented evidence that the corps' actions had negatively affected the water supply of the reservation:

We don't have the water to provide for our people. One year ago ... we had approximately 10,000 people without water. These were Indian and non-Indian people within our reservation of 2.3 million acres [and 18,000 people]. ... Senator, we have a major issue out there with the management of the Missouri River situation.⁴

Tim Johnson, Senator from North Dakota, added that the situation is "particularly disconcerting given the treaties that bind the Federal Government's responsibility to our tribes in North and South Dakota."⁵

To be sure, the issue at that time had to do with distribution problems resulting from drought, the formation of Lake Oahe (itself a mid-twentieth-century invention of the Army Corps of Engineers), and incomplete infrastructure. But the pattern of disregard for the Standing Rock Sioux's concerns about water was at this point quite clear, and the effects on the bodies of the reservation's residents were dramatic. For example, the testimony notes that several dialysis centers had to be closed due to lack of water. Kent Conrad, US senator from North Dakota, stressed that one problem lay in how "this is all overwhelmingly managed for the benefit of the barge industry downstream ... this dire situation ... underscores the need for change in the management of the Missouri River. We can't afford this any longer. People's lives are at risk without water. What could be more clear?"⁶ And North Dakota Senator Dorgan put the moral and legal point firmly, interrogating the Army Corps of Engineers:

⁴ Testimony of Charles Murphy, in "Water Problems on the Standing Rock Sioux Reservation," US Senate Committee of Indian Affairs (November 18, 2004), 2–3.

⁵ Testimony of Senator Tim Johnson, *ibid.*, 5.

⁶ Testimony of Kent Conrad, *ibid.*, 8.

Is the assured supply of water for citizens who receive that water from the river a higher priority than other priorities, or is it simply equivalent to others? ... In my judgment, the management of the river must understand that the first and most important priority is to make sure that we don't have people cutoff from an adequate supply of water.⁷

The relevance of such questions and concerns over access to water as a *justice* issue, a structural problem, and a militaristic connection was clear to Senator Daniel Inouye, chair of the Committee on Indian Affairs. In his closing remarks, he noted the parallels between the Army Corps of Engineers' actions affecting the Standing Rock Sioux, on the one hand, and the US military's reception in Iraq:

When our troops entered Baghdad, the people there received us with cheers and with huzzahs ... But we noted that within a week these same faces became faces of anger. And in our hearts we knew that there were many causes for this. One of the major causes was that we did not have plans to repair the damaged water systems and the damaged sewer systems.⁸

Such an admission has profound implications regarding the militaristic-colonial complex that mediates access to water. Given these historical precursors and structural tendencies, it was perhaps not surprising that the Army Corps of Engineers fast-tracked the DAPL through the Standing Rock reservation to transport fossil fuels from the Bakken oil shale, crossing and traveling under the Missouri River. Proponents of DAPL point out that transportation of shale oil through pipelines is safer than overland transit on highways or railways. Opponents respond that the dangers to water sources are unacceptable, and the continued societal reliance on fossil fuels should be phased out in pursuit of clean energy options.

Energy Transfer Partners, the operating company for DAPL, asserts that it has followed due procedures in soliciting input from the Sioux. Representatives from the reservation disagree and have filed a lawsuit claiming that due process was violated. Moreover, indigenous activists argue that the permitting process itself is fundamentally flawed in ways that reflect neocolonial mentalities of the US government and the extractive industrial-profit complex of contemporary multinational corporations. They further claim that water, as a source of life, is more important than extractive industries' desire for a pipeline in this particular place. As the website of the Standing Rock Sioux phrases it: "In honor of future generations, we fight this pipeline to protect our water, our sacred places, and all living beings."⁹ Indigenous Environmental Network elaborates upon the issue this way:

In North Dakota, Indigenous leaders from the Standing Rock Nation are fighting the Dakota Access Pipeline (DAPL). This pipeline will carry over a half a million

⁷ Senator Byron Dorgan, *ibid.*, 14, 16.

⁸ Senator Daniel Inouye, *ibid.*, 22.

⁹ Standing Rock Sioux Tribe, "Stand with Standing Rock" (2017). Online: <http://standwithstandingrock.net> (accessed January 3, 2017).

barrels of oil per day from the Bakken Oil Shale Fields. The route the pipeline will take, if approved, will be laid under multiple bodies of water, to include the Missouri River located a half mile upstream from the Standing Rock reservation. This river not only supplies drinking water to the tribe but is a major tributary to the Mississippi River where more than 10 million people depend on it for both human consumption and irrigation for the nation's "bread basket." This pipeline when it fails—and it will fail—will destroy land and water with little, if any, chance of remediation/cleanup. We only need to look at the devastating Yellowstone River, Kalamazoo, and many others. Protesters have continued to resist construction peacefully, despite surveillance and intimidation from the state.¹⁰

Consultation with tribes is expected but how this requirement is to be fulfilled is quite vague. Thus, according to the *New York Times*,

The Corps says it reached out extensively to tribes before it gave approval for the Dakota Access pipeline to cross bodies of water, including the Missouri. The Standing Rock Sioux, it says, canceled a meeting to visit the pipeline's proposed crossing across Lake Oahe. The tribe says it was not properly consulted.¹¹

Director of Indigenous Environmental Network, Tom Goldtooth, argues that "consultation" has not been sufficiently interpreted:

What the US calls consultation is not consultation but a statement telling people what they're doing after millions of dollars have been invested, painting Indigenous Peoples as spoilers. The right of free, prior and informed consent begins prior to the planning process, not when their bulldozers are at your doorstep.¹²

As a result, there was some optimism when in December 2016 then-President Obama did not grant a "last remaining easement" to "drill under the Missouri River at Lake Oahe and complete construction of the pipeline" and would require an environmental impact statement to consider alternate routes.¹³ Such momentary optimism, however, must be understood in the context of a shifting political climate. For example, within the span of just two months after President Obama's intervention to require a thorough environmental impact statement, President Trump granted an easement allowing the pipeline to continue. That, in turn, drew an immediate legal challenge from the Sioux.

¹⁰ Indigenous Environmental Network (2017). Online: www.ienearth.org/stand-with-standing-rock-no-dapl/ (accessed January 3, 2017).

¹¹ Jack Healy, "I Want to Win Someday: Tribes Make Stand against Pipeline," *New York Times* (September 9, 2016). Online: <http://www.nytimes.com/2016/09/09/us/dakota-access-pipeline-protests.html> (accessed December 27, 2016).

¹² Indigenous Environmental Network (2017).

¹³ Sacred Stone Camp, "DAPL Easement Suspended but the Fight's Not Over," (December 5, 2016). Online: <http://sacredstonecamp.org/blog/2016/12/2/obama-administration-denies-final-easement-whats-next> (accessed January 3, 2017). Doug Hayes, "What's Next for Standing Rock and the Dakota Access Pipeline Fight?" *The Planet* (December 13, 2016). Online: <http://www.sierraclub.org/planet/2016/12/whats-next-for-standing-rock-and-dakota-access-pipeline-fight> (accessed January 3, 2017).

The pipeline—and resistance to it—will continue to be mired in legal and political machinations. Meanwhile, it must be said that the mechanisms of the state—North Dakota, the Army Corps of Engineers, or the federal government—have not primarily been geared toward protecting the protestors. Instead, physical and digital intimidations have occurred: from the accusation of signal-jamming drones blocking Wi-Fi at the Oceti Sakowin base camp (obscuring communication and online activism) to arrests of filmmakers, to fire hoses of hot water being sprayed at protestors in the middle of winter on a rural highway. As the American Civil Liberties Union summarizes:

More than 200 tribes and several thousand indigenous people from across the country have gathered in North Dakota to protest the Dakota Access Pipeline. The protestors are defending the land and water using little more than the right to assemble and speak freely—a protection afforded by the U.S. Constitution. In response to the protests, North Dakota's government suppressed free speech and militarized its policing by declaring a state of emergency, setting up a highway roadblock, and calling out the National Guard.¹⁴

Such litanies of structural, legal, and physical intimidations forestall blithe optimisms. But neither do these intimidations occlude the strength of heart expressed by the water protectors, indigenous activists, and allies. The nonviolent approach embraced by Standing Rock leaders is rendered visible by an image from the night that the water hoses were sprayed on peaceful protestors. For Louise Erdrich, writing in the *New Yorker*, the enduring image is of a person, “covered in ice and praying, [illustrating] the resolve that comes from a philosophy based on generosity of spirit.”¹⁵ Brenda White Bull, a veteran and Lakota woman, stated simply: “The highest weapon of them all is prayer. ... The world is watching. Our ancestors are watching. ... We are fighting for the human race.”¹⁶

The conflict at Standing Rock embodies a tangle of disenfranchisements over water, land, sovereignty, and economic benefit that obviously has unique features. But it is also simultaneously emblematic of broader structural patterns of disenfranchisement and settler colonialist legacies wrought upon the lives, cultures, and lands of native peoples in the United States and worldwide. Roxanne Dunbar-Ortiz, in the award-winning book *An Indigenous People's History of the United States*, notes that

Through economic penetration of Indigenous societies, the European and Euro-American colonial powers created economic dependency and imbalance of trade, then incorporated the Indigenous nations into spheres of influence and controlled them indirectly or as protectorates. ... In the case of US settler colonialism, land was the primary commodity.¹⁷

¹⁴ ACLU of North Dakota, “Stop Government Suppression of the Right to Protest in North Dakota.” Online: <https://action.aclu.org/secure/nd-standing-rock-sioux-tribe> (accessed January 3, 2017).

¹⁵ Louise Erdrich, “Holy Rage: Lessons from Standing Rock,” *The New Yorker* (December 22, 2016). Online: <http://www.newyorker.com/news/news-desk/holy-rage-lessons-from-standing-rock> (accessed January 3, 2017).

¹⁶ Ibid.

¹⁷ Roxanne Dunbar-Ortiz, *An Indigenous People's History of the United States* (Boston: Beacon Press, 2014), 7.

Chairman David Archambault II specifies this as a “familiar story in Indian Country”:

This is the third time that the Sioux Nation’s lands and resources have been taken without regard for tribal interests. ... When the Army Corps of Engineers dammed the Missouri River in 1958, it took our riverfront forests, fruit orchards and most fertile farmland to create Lake Oahe. Now the Corps is taking our clean water and sacred places by approving this river crossing. ... Protecting water and our sacred places has always been at the center of our cause. The Indian encampment on the Cannonball grows daily, with nearly 90 tribes now represented. Many of us have been here before, facing the destruction of homelands and waters, as time and time again tribes were ignored.¹⁸

The embodied burdens are real. The pipeline will disproportionately affect vulnerable Native American populations, as research by contemporary geographers Jennifer Veilleux and Candace Landry has indicated.¹⁹ Seasoned journalist and activist Bill McKibben situates the conflict within this larger history of disenfranchisement:

Native Americans live confined to bleak reservations in vast stretches of the country that no one thought were good for much of anything else. But those areas—ironically enough—now turn out to be essential for the production or transportation of the last great stocks of hydrocarbons, the ones whose combustion scientists tell us will take us over the edge of global warming. And if former generations of the U.S. Army made it possible to grab land from Native people, then this largely civilian era of the Army Corps is making it easy to pollute and spoil what little we left them. ... A spill from this pipeline would pollute the Missouri River, just as spills in recent years have done irreparable damage to the Kalamazoo and Yellowstone rivers. And that river is both the spiritual and economic lifeblood of the Standing Rock Reservation, one of the poorest census tracts in the entire country.

In other words, DAPL—like many extractive projects worldwide—is inextricably interwoven with legacies of racism, economic exploitation, and histories that make this particular case a familiar kind of story. And it is important to note that when US scholars attend to the Standing Rock protests as a site of water activism, we must also be willing to ask why similar kinds of attention may not be paid to the travesties and attempts at recovery of historically marginalized and racialized communities like Flint, Michigan, where water sources are not just hypothetically tainted but were truly contaminated in ways that once again reveal the systemic racisms built into US infrastructure.²⁰

¹⁸ David Archambault III, “Taking a Stand at Standing Rock,” *New York Times* (August 24, 2016). Online: <http://www.nytimes.com/2016/08/25/opinion/taking-a-stand-at-standing-rock.html> (accessed December 27, 2016).

¹⁹ Jennifer Veilleux, “Income Maps of the Native Americans Living in the Missouri River Basin,” *The Way of Water* (December 19, 2016). Online: <http://jveilleux.blogspot.com/2016/12/income-maps-of-native-americans-living.html?m=1> (accessed December 27, 2016).

²⁰ Michigan Civil Rights Commission, “The Flint Water Crisis: Systemic Racism through the Lens of Flint” (February 17, 2017). Online: https://www.michigan.gov/documents/mdcr/VFlintCrisisRep-F-Edited3-13-17_554317_7.pdf (accessed July 12, 2017).

#NODAPL activists predicate their resistance to fossil-fuel transportation pipeline on two major ethical claims: first, water is life; and second, indigenous sovereignty should outweigh for-profit/neocolonial and government-backed expansion of extractive industry infrastructure. There are new developments afoot, or at least twenty-first-century expansions of historical forms of resistance and solidarity. For example, the collaboration of more than 200 native groups in expressing solidarity over protecting water and opposing the pipeline is a robust, twenty-first-century incarnation of solidarity. Marion Grau observes another exciting way that the protests are squarely rooted in both traditional identities and contemporary tools:

It is heartening to see many young indigenous women in particular lead and speak. They are quick to tell the gathered crowds that they are college-graduated and able to use tech-savvy information strategies through outlets such as Indigenous Environmental Network and many others. They are gloriously hybrid leaders—the “digital natives” nobody was thinking of when they coined that term—combining the best of subversive education and information technology, blending indigenous and post-industrialized ways of being.²¹

Where linkages among systemic disenfranchisements and violent actions of the state are particularly evident, powerfully symbolic solidarities have sprung up—as with the many military veterans who journeyed to North Dakota to protect the native bodies who were in turn protecting the water. Some of these military veterans include Native Americans, who “serve in the US military at a higher rate than any other ethnic group.”²² Tribal chairman David Archambault II addressed veterans with gratitude: “What you are doing is precious to us. I can’t describe the feelings that move over me. It is *wakan*, sacred. You are all sacred.”²³

In these ways and more, #NODAPL is a crucial site and moment for collective consciousness about historical and contemporary forms of domination, which have been structurally, legally, and physically unrelenting upon subaltern human bodies and bodies of water. The slogans “we are water,” “water is sacred,” and *Mni wiconi* are vital portals to twenty-first-century forms of justice.

Laudato Si': The value(s) of water and a papal turn to indigenous knowledge

Given the Catholic Church’s historical vindications of European colonization in the Americas with its late fifteenth-century papal bulls, it may seem surprising that the current pope has stressed the importance of indigenous knowledge and value

²¹ Marion Grau, “‘The Camp Is a Ceremony’: A Report from Standing Rock,” *Religion News Service* (November 25, 2016). Online: <http://religiondispatches.org/decolonizing-thanksgiving-at-standing-rock-a-black-friday-report/> (accessed December 27, 2016).

²² Erdrich, “Holy Rage.”

²³ Ibid.

systems.²⁴ As Bill McKibben put it in the *New York Review of Books*, such admiration for cultural diversity and indigenous knowledge is remarkable coming from the leader of an institution that “first set out to universalize the world.”²⁵ Of course, Pope Francis is a man whose ministry and theological reflection has been shaped by the experience of serving and leading religious communities in South America. This experience forms some of the background to *Laudato Si’* and reflects a liberation theology orientation to praxis and social justice. Moreover, in *Laudato Si’* and in numerous addresses, Pope Francis is clear that local and indigenous populations are repositories of cultural-moral values regarding the environment and should have central roles in any decisions affecting their land.²⁶

This is potentially promising, as many indigenous leaders have noted. But in this beginning is a crucial caveat: it can be dangerous when the spur to recognition of pluralistic value systems comes from a centralized patriarchal authority that is historically associated with colonialism and universalism and normatively expounded by predominantly white scholars in the northern hemisphere, especially the United States. What, then, are important ground rules to establish as (mostly white) scholars of CST such as I engage the papal suggestion that indigenous cultures need to be respected and honored? Literature engaging this question is extensive and nuanced in several disciplines, including liberation theology, decolonizing discourses, and indigenous activism. This topic deserves much fuller treatment in CST. Several insights come to the fore.

First, “indigenous” is not a uniform category but instead reflects enormous internal diversity, even while there are consistent and recognizable historical patterns of colonialism, racism, disenfranchisement, and cultural obliteration. Second, “indigenous knowledge” or the input of these sovereign peoples is not a category to which lip service can be paid and which then proceed with business-as-usual (as has generally been the case with “consultations” with native peoples, with a case in point being DAPL, as indicated in preceding sections). Instead, these conversations have to be truly subject to an open range of possible courses of action, even economically undesirable ones, within which the more powerful parties do not get to determine ultimate outcomes but rather defer to the historically marginalized and vulnerable populations that will be most affected by various projects (as Pope Francis notes in *Laudato Si’*). In a related way, third, there needs to be an explicit baseline ethical-procedural requirement that rejects any reinscription of historical or epistemic harms and is wary of blithe appeals to “inclusion” without actual praxis. Fourth and finally, there is a profound difference between “standing with” and “speaking for,” whether as researchers or activists. Nado Aveling, describing a process of discernment regarding research agendas and the vagaries of the scholarly gaze, suggests that even for well-intentioned and justice-oriented scholars:

²⁴ For a fuller exposition and analysis of this development, see Christiana Zenner Peppard, “*Laudato Si’*,” in *Modern Catholic Social Teaching: Commentaries and Interpretations*, (ed.) Kenneth Himes, OFM (Washington, DC: Georgetown University Press, 2017).

²⁵ Bill McKibben, “The Pope and the Planet,” *New York Review of Books* (August 13, 2015). Online: <http://www.nybooks.com/articles/2015/08/13/pope-and-planet/> (accessed December 27, 2016).

²⁶ See Zenner Peppard, “*Laudato Si’*.”

the journey from my hitherto “emanicipatory” position grounded in a white western paradigm, to being a reasonably effective ally has taken time and necessitated an in-depth exploration of, not only the literature dealing with Indigenous methodologies, but also a return to the scholarship that critically deconstructs whiteness. My primary aim was to investigate what Indigenous scholars were saying about research and find out what a non-exploitative, culturally appropriate approach to research might look like and where I might “fit” in terms of doing research.²⁷

If such caveats can be recognized, and the journey of discernment and self-critique within the research establishment can be heeded, then the pope’s recognition of indigenous knowledge is timely.

Scholarly authority is not the same as lived cultural praxis on matters of ecological and social values, but it is a vehicle for communication, reflection, and perhaps the galvanizing of Catholic communities. As John Thavis observed, the “struggle at Standing Rock has made allies among people of many faiths, and should resonate with Catholics who are listening to this pope’s social teaching.”²⁸ As many activists and scholars have noted, the twenty-first century is a time of rising awareness of indigenous knowledge and insights, consolidated activist alliances, and pluralistic values regarding the protection of land-people-water-culture. Scholars such as myself can amplify the firsthand experience of water warriors and explicate what resources or norms CST may offer to such struggles. In such ways, we can seek to stand in epistemic and ethical solidarity, as long as we recognize that the perspectives we bring to the conversation are offerings, not answers.

Freshwater in Catholic social teaching and *Laudato Si'*

As I have observed elsewhere, the statements made in *Laudato Si'* on freshwater represent a distilled and slightly expanded version of magisterial teaching on this topic that has been in development for over a decade.²⁹ In sum, Pope Francis suggests that water conveys something holy, something requiring attitudes and actions of respect and reverence, because it is a gift from God that is fundamental to human dignity and the sanctity of life. Since at least 2003, John Paul II, Benedict XVI, the Pontifical Academy for Justice and Peace, and now Pope Francis have articulated the importance of access to clean freshwater. These concerns include the lack of access to freshwater in non-industrialized nations, the impacts on the poor and vulnerable, the ways in which commodification of water impedes access to this fundamental good, and the corrective conceptual mechanism of viewing freshwater as a fundamental human right.³⁰ Pope

²⁷ Nado Aveling, “Don’t Talk about What You Don’t Know: On (not) Conducting Research with/in Indigenous Contexts,” *Critical Studies in Education* 54.2 (2013): 206.

²⁸ John Thavis, “Standing Rock Activists See Pope Francis as Spiritual Ally,” *Religion News Service* (December 2, 2016). Online: <http://religionnews.com/2016/12/02/standing-rock-activists-see-pope-francis-as-spiritual-ally/> (accessed January 3, 2017).

²⁹ This section is adapted from Peppard, “Theology, Hydrology, and *Laudato Si'*” as well as my commentary on *Laudato Si'* in *Modern Catholic Social Teaching*.

³⁰ See Christiana Zenner Peppard, *Just Water: Theology, Ethics, and the Global Water Crisis* (Maryknoll: Orbis, 2014), chapter 4; and Zenner Peppard, “Fresh Water and Catholic Social Teaching: A Vital Nexus,” *Journal of Catholic Social Thought* 9.2 (2012): 325–51.

Francis reiterates such notions in *Laudato Si'*, adding: "Our world has a grave social debt towards the poor who lack access to drinking water, because they are denied the right to a life consistent with their inalienable dignity."³¹ (In his address to the United Nations on September 25, 2015, he further explained that water is among the things that allow people "to be dignified agents of their own destiny.") Such ethical claims are noteworthy in themselves. They are also particularly suggestive when coupled with the pope's statements on indigenous cultural value and ecological knowledge and then mobilized to the context of Standing Rock.

In *Laudato Si'*, Francis compares cultural elimination to species extinction: "The disappearance of a culture can be just as serious, or even more serious, than the disappearance of a species of plant or animal."³² In addition, it is possible to discern in *Laudato Si'* an emphasis on the importance of indigenous sovereignty and self-determination, including cultural frames for understanding, valuing, and managing ecological systems and relationships. For example: "It is essential," writes Francis, "to show special care for indigenous communities and their cultural traditions. They are not merely one minority among others, but should be the principal dialogue partners, especially when large projects affecting their land are proposed."³³ What would it look like for the Catholic Church and other dominant institutions—including, for example, the US government or Army Corps of Engineers or Energy Transfer Partners—to truly consider pluralities of values based on the epistemic authority of colonized peoples? Granted, in *Laudato Si'*, Francis does not explicitly consider what indigenous cultures may offer to ethical discourse on water. But the epistemic point stands: the pope's recognition of indigenous traditions provides an opening to consider how multiple ways of being and understanding constitutive relationships can enrich, challenge, and construct countervailing accounts to the dominant historical, colonial-industrial, Western political economic forces that have shaped patterns of valuing and distributing water (and other entities of the natural world). Does the papal appeal to the value of indigenous cultures provide a glimpse of affirmation of humanity's essential plurality, perhaps even validating subaltern authority, with implications for governance? And are there any substantive, normative linkages that can be made between *Laudato Si'* and Standing Rock?

Water justice and indigenous knowledge between *Laudato Si'* and Standing Rock

Mni wiconi (water is life) is a refrain and rallying cry for #NODAPL actions. It summons the idea of the sacredness of waters that sustain human and ecosystemic function, and it points toward the moral imperatives of tribal sovereignty and environmental justice. Along with "water is sacred" and "we are water," *Mni wiconi* appears on posters

³¹ Pope Francis, *Laudato Si': On Care for Our Common Home* (May 24, 2015), §30. Online: http://w2.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si.html (accessed March 10, 2017).

³² *Ibid.*, §145.

³³ *Ibid.*, §146.

both handmade and digital, on the front lines of protests and solidarity/fund-raising concerts, and on the home pages of the Indigenous Environmental Network and the Standing Rock Sioux.

What has CST—especially *Laudato Si'*—to say to this contemporary situation? John Thavis suggests that even while Pope Francis hasn't directly addressed the Standing Rock situation, "he has been present" in the hearts and minds of water protectors. Chairman David Archambault II reportedly sent a letter to the pontiff, "thanking Francis for his statements, explaining the pipeline battle and asking for the pope's prayers."³⁴ Consider, then, what the following words from *Laudato Si'* mean for Standing Rock:

It is essential to show special care for indigenous communities and their cultural traditions. They are not merely one minority among others, but should be the principal dialogue partners, especially when large projects affecting their land are proposed. For them, land is not a commodity but rather a gift from God and from their ancestors who rest there, a sacred space with which they need to interact if they are to maintain their identity and values. When they remain on their land, they themselves care for it best. Nevertheless, in various parts of the world, pressure is being put on them to abandon their homelands to make room for agricultural or mining projects which are undertaken without regard for the degradation of nature and culture.³⁵

This passage needs little translation to Standing Rock and DAPL: effective procedural collusion between the Energy Transfer Partners corporation, the government permitting process, and the Army Corps of Engineers has led to the construction of a major project linked to extractive energy economies that has not considered the Standing Rock Sioux to be "principal dialogue partners," not even when their lands are affected. The slogan of *Mni wiconi* and assertions of prayer as a form of protest clearly indicate that there are major spiritual values at work at Standing Rock, in ways resonant with the papal observation that "land is not merely a commodity but a gift from God and their ancestors." And certainly, major pressures (structural, legal, and physical) are being placed on the Standing Rock water protectors.

But is verbal or written exhortation enough? Mark Silk of *Religion News Service* observed that despite the papal call to attention and action, "these issues cut no ice with the Catholic bishops of North and South Dakota, or with the US Conference of Catholic Bishops itself, whose silence on the Dakota Access pipeline was deafening."³⁶ Indeed, the silence is deafening when one notes the post-*Laudato Si'* absence of diocesan Catholic involvement in, or advocacy for, Standing Rock's unique concatenation of environmental justice and religious liberty. Where are the local and regional dioceses or Catholic universities that could adroitly bring such values to religious discourse and ethical reflection? Concerned with the lack of Catholic voices in supporting the water protectors,

³⁴ Thavis, "Standing Rock Activists."

³⁵ Pope Francis, *Laudato Si'*, §146.

³⁶ Mark Silk, "The Disappointing Victory at Standing Rock," *Religion News Service* (December 6, 2016). Online: <http://religionnews.com/2016/12/06/the-disappointing-victory-at-standing-rock/> (accessed January 3, 2017).

members of the Sisters of St. Joseph reached out to me in October, alarmed that despite the strong statements in *Laudato Si'*, no Catholic leaders had articulated a position of defending the Earth or the marginalized at Standing Rock. Indeed, in this sense, Silk's estimation rang true: "It was the usual liberal-left religious suspects who stepped up—mainline Protestant denominations, Reform Jews, Evangelicals for Social Action, the Franciscan Action Network, the Leadership Conference of Women Religious."³⁷

This is not to suggest that all Catholics are dispassionate. Many individuals who understand Catholicity to exist not in abstruse creeds but in embodied practices have found ways to support the efforts at Standing Rock, from online advocacy to physical presence. Consider the example of Fordham doctoral candidate in theology, Eric Martin, who was one of many drawn for spiritual, ethical, and civic reasons to support the water protectors:

I had come with a group of Catholic Workers for reasons anyone studying or teaching theology as I do might find obvious. The violation of basic dignity happening here defies the consistent refrain by the prophets and Jesus to do justice with an eye toward the exploited. We had been told white bodies could help by surrounding native ones, shielding them while they sought to protect their water.³⁸

These are crucial actors and visible forms of solidarity, expressed by those who take the linkage between theology and praxis to be central to lives of faith.

Even so, the values of water justice and indigenous cultural knowledge that are embedded in *Laudato Si'* seem not yet to have permeated the heavily frocked US Catholic establishment. This is tragic on numerous levels—for the bodily integrity risked daily by the water protectors, for the lost opportunity for CST to be expressed bravely and with much-needed mainline leadership by Catholic churches, for the lost opportunity for witness to the convergence of life-giving pluralistic values on the centrality of water to life and as a "right to life issue," and for what it reveals about the selective attention that some US Catholics pay to papal social encyclicals. The lack of integration is also tragic given the hype that *Laudato Si'* received both before and after its promulgation in 2015, and in light of the fact that—in the words of Marion Grau—the "vision of the movement gathered at Standing Rock is anything but secular, it is deeply religious and spiritual, but also defiant of those two overused categories."³⁹ Indeed, some of the most important religious liberty issues of the twenty-first century will be at precisely this nexus of environmental degradation, indigenous rights, and water justice. Whether the most profound implications of *Laudato Si'* will be deflected or embraced by dominant cultures and Catholic leadership in dioceses and universities remains to be seen. There may not be grounds for optimism, but as has been abundantly evident at Standing Rock, that is no cause for loss of hope.

³⁷ Ibid.

³⁸ Eric Martin, "At Standing Rock and Beyond, What Is to Be Done?" *The Stone*, *New York Times* (November 25, 2016). Online: <http://www.nytimes.com/2016/11/25/opinion/at-standing-rock-and-beyond-what-is-to-be-done.html> (accessed December 27, 2016).

³⁹ Marion Grau, "'The Camp Is a Ceremony': A Report from Standing Rock," *Religion Dispatches* (November 25, 2016), <http://religiondispatches.org/decolonizing-thanksgiving-at-standing-rock-a-black-friday-report/>.

Conclusion

“Water is a verb,” wrote Craig Childs in *Orion Magazine*.⁴⁰ Water is a verb—or an entity that shape-shifts between noun and verb—much like other sparkling notions: life, love, culture, ethics. Far from being an inert entity, water is a source of life and site of economic and social control, an occasion for activism, and an enduring if shape-shifting substance that refracts multiple notions of morality and the sacred. The convergence of teachings in *Laudato Si'* and activisms surrounding *Mni wiconi* give vibrant proof of this truth.

At stake in Standing Rock, and other conflicts over freshwater worldwide in the twenty-first century, is the question of who authoritatively narrates the story, substance, and value of water. Who accounts for the flows that determine distributive systems and ethical parameters by which communities in various parts of the world must live? These are crucial grounding questions for any sufficient ethic of water justice if the twenty-first century is going to avoid repeating the hubristic brutalities of the past.

It is cause for hope that throughout the twentieth and now twenty-first century, many nondominant cultures and indigenous action groups have challenged the values embedded in Western forms of development-incentivized resource management, especially pertaining to water, and have done so in ways that give rise to myriad expressions of solidarity and the formation of geographically disparate but ethically proximate digital communities.⁴¹ It is also cause for hope that Pope Francis seems to be drawing attention to the moral insights and ecological-cultural claims of native peoples, not merely a personal charisma but as a series of principled claims built into some of the most authoritative types of teachings on Catholic faith and morality.

This chapter has suggested that *Laudato Si'* generates important normative anchors that connect with indigenous claims about sovereignty and integrity of waters made by #NODAPL water protectors at Standing Rock. Catholics who affirm papal authority, especially those in the Dakotas specifically and the United States more generally, should be attending to the ways in which Catholic teaching calls for express protection of vulnerable human beings, indigenous cultures, and water. In the case of freshwater, the Catholic magisterial embrace of water as a “right to life issue” aligns in profound and obvious ways with the Lakota Sioux claim, *Mni wiconi*. And the convergence of *Laudato Si'* with water justice and indigenous knowledge at Standing Rock provides an opportunity to put faith into action: that is, to discern how variegated ways of life and knowledge traditions should be regarded with profound respect and humility. No longer the “other” of normative Western discourse, indigenous traditions must be conversation partners and sources of deep knowledge and critiques against dominant-extractive-industrial value systems, environmental-social subordination to short-term economic benefit, and colonialist legacies of domination. Dominant society’s norms regarding valuation and allocation of water should not be blithely considered as best courses of action from an ethical perspective. The historical default is not always worthy of deference, for as Jeremy Schmidt points out, the norms that condition

⁴⁰ Craig Childs, “The Birthplace of Water,” *Orion Magazine* (January/February 2016).

⁴¹ See, for example, www.culturalsurvival.org.

the distribution and flow of waters in the United States are themselves historically contingent constructions that reflect certain configurations of power.⁴²

Given how norms regarding use of water (not to mention decision-making about water) are conditioned by legacies of colonialism and domination, it is time to recognize that water is a socio-natural liquid and thus to attend to values of water that have been historically marginalized through patterns of colonialism and neocolonialism. Perhaps, then, a most revolutionary reading of *Laudato Si'* and Standing Rock is also the most obvious. It exists at the confluence of where water justice meets indigenous knowledge and experience, and might be summed up as follows.

First, any sufficient ethic of water justice will embody careful and historically informed value epistemology. It will proceed by welcoming diverse cultural perspectives grounded in land and forgotten/occluded/colonized histories. It bounds past entrenched anxieties about moral relativism by refining how diverse cultural value systems mesh with ethical systems.

Second, any stalwart and sufficient ethic of water justice will require that the people most affected by water decisions have a strong voice at the table of decision-making, attuned to asking: who benefits, in what ways? Who bears the burdens, for what duration? What is it that we are not yet seeing? As Pope Francis wrote in *Laudato Si'*:

A number of questions need to be asked in order to discern whether or not [a given project] will contribute to genuine integral development. What will it accomplish? Why? Where? When? How? For whom? What are the risks? What are the costs? Who will pay those costs and how? In this discernment, some questions must have higher priority. For example, we know that water is a scarce and indispensable resource and a fundamental right which conditions the exercise of other human rights. This indisputable fact overrides any other assessment of environmental impact on a region.⁴³

Finally, any sufficient ethic of water justice will recognize that the discernment and implementations of norms and policies are hardly static. Water, both noun and verb, is a trickster: always in motion and context specific, it takes the shape of any container—whether a vessel or a river, a political-economic system or a religious ritual. Yet amid that diversity, there is still a universal truth: *Mni wiconi*—water is life. Water justice requires honoring the water protectors who hold this truth against the structures, legal regimes, and physical oppressions that accompany our particular iterations of neocolonialism, at Standing Rock and beyond.

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Eating Our Way into the Care of Our Common Home

Norman Wirzba

In *The End of Plenty: The Race to Feed a Crowded World*, journalist Joel Bourne, Jr., takes his readers on a journey across the globe to explore the various strategies scientists, researchers, and farmers are developing to increase food production.¹ The Green Revolution, now over half a century old, is examined along with the Blue Revolution, a more recent attempt to farm our oceans for fish stock. Genetic modification of seed varieties is contrasted with the burgeoning study of organic and natural systems agriculture. And we learn how trade deals, financial instruments, and the growth of multiple agricultural technologies (in machinery, irrigation, pest management) are taking effect—sometimes for good, sometimes for ill—in places as diverse as China, Ukraine, Kazakhstan, Iowa, India, Malawi, and Bangladesh.

Agriculture may not be much on the minds of people, but it needs to be, because agricultural practices reflect what and how a culture values the natural world. Agriculture is one of humanity's dominant ways of establishing a common home. As has become clear, however, agricultural practices are not without problems. The problem is not simply whether we will be able to feed a growing human population (an increasing number of which are choosing diets that are more resource extractive). We also need to attend to the fact that industrial agriculture is a major producer (roughly 25 percent) of greenhouse gases and that it is a dominant force in the reduction of plant and animal biodiversity (as land is cleared for food and energy production).² Agriculture is the roughly 10,000-year-old achievement that has forever altered the face of our planet. Given agriculture's destructive legacy with respect to soil, and the general drawdown of the Earth's fertility, it is not clear that we will be able to feed everyone for very long.³

¹ Joel Bourne, Jr., *The End of Plenty: The Race to Feed a Crowded World* (New York: W.W. Norton & Company, 2015).

² Numerous factors contribute to the figure, ranging from fossil-fuel inputs in the production of food (for humans) and feed (for animal livestock), the release of stored carbon (through tilling), the clearing of forests to increase land areas for agricultural use, and the production and distribution of food. For more detail, see the reports of the Intergovernmental Panel on Climate Change, the US Environmental Protection Agency, and the Union of Concerned Scientists.

³ A number of books now exist detailing how soil mismanagement has led to the collapse of cultures. Foremost among them is David Montgomery, *Dirt: The Erosion of Civilizations*, 2nd edn. (Berkeley: The University of California Press, 2012).

The looming question throughout Bourne's book is this: was Thomas Robert Malthus, the nineteenth-century British vicar, historian, and political economist, right when he argued that population growth (which increases in geometric ratios when unchecked) would soon outstrip food production (which increases in arithmetic ratios, up to a point)? Though something like the "Malthusian collapse"—the idea that the world's population as a whole will balloon and then crash owing to the misery of starvation—has not come to pass, it is clear that specific regions at specific times have seen their populations suffer from famine (the causes of which often have more to do with economic and political injustices and incredible amounts of food waste than with the ability of farmers to grow a sufficient amount of food).⁴ There is a chasm between geometric and arithmetic growth, and a conflict between the hungers for sex and food.

Malthus was writing at a time (his *Essay on the Principle of Population* appeared in 1798) when his peers, though perhaps aware of the link between industrial modes of production and environmental degradation, did not have a detailed understanding of the limits of food production. The frontier, we might say, was believed by many to be open, waiting to be explored and developed. Though damage on agricultural lands was being done, new lands were destined to become available. Nature's reserves were thought to be infinite, and human ingenuity boundless. According to influential writers like the Marquis de Condorcet, the work of reason, when combined with advances in science and technology, was leading humanity toward utopia.

Two centuries later, Bourne is not so confident. Having traveled the world and having seen up close the challenges farmers are facing on the ground—degraded soil, limited land and water, poor or nonexistent infrastructure, corrupt governments, indebted and bankrupt farmers, the erosion of agricultural communities and traditions of practice, weed resilience, new pest and disease vectors, warming and erratic weather, foreign purchase of domestic lands—Bourne concludes:

Producing food for more than 9 billion people without destroying the soil, water, oceans, and climate will be *by far the greatest challenge humanity has ever faced*. It will affect everyone, from poor farmers in Africa to the well-heeled suburban grocery shoppers of the West. The fate of the world's great ecosystems, from the Amazon rain forests to Africa's Serengeti Plain, equally hangs in the balance ... *agriculture must change*. None of our current agronomic systems have shown much capacity for weathering the vagaries of even the half degree of temperature

⁴ In his book, *Poverty and Famines: An Essay on Entitlement and Deprivation*, the Nobel Prize-winning economist Amartya Sen was among the first to argue that food production was not the primary issue because many famines occurred in places where there was plenty of food to go around. Inflation, inadequate income, war, inept government policies, market speculation, and hoarding are the primary drivers of starvation. As Bourne discusses, however, it is not an accident that an economist would focus on economic malfunction. Since Sen's pioneering work, agronomists have demonstrated that Sen's analysis did not take sufficient account of the agronomic factors that contributed to a famine such as the one that occurred in Bengal in 1943. Food production depends at the most fundamental level on the optimization of ecosystem functioning. These do sometimes break down owing to "natural" phenomena like weather (hail, drought, pest infestation, etc.). They are certainly exacerbated by inadequate infrastructure, the collapse of farming communities, and unjust economic and political policies. For a description of these matters, see chapter 2 of Bourne, *The End of Plenty*.

rise that we've experienced thus far, much less the climate that is forecast to be hovering over our fields in a few short decades.⁵

How will we produce enough food for a growing population in an increasingly degraded, resource-starved world? How will we treat the millions of undernourished people suffering from the diseases of malnourishment, or house, employ, and feed the tens of millions of people made into refugees owing to rising sea levels, catastrophic drought, or other forms of weather-related upheaval? How will we accommodate the growing demand for meat (which presupposes an expansion of the land base needed to supply animal feed), as more and more people become accustomed to the Western diet, and at the same time make more land available for the production of ethanol fuel? How will we handle the justice questions that will invariably arise as populations—many of them poor, some of them rich—battle for the food and water that are available? These are the sorts of questions that compel Bourne to conclude that “agriculture must change.”

But for agriculture to change, a whole lot else must change with it. This is because agricultural practices witness to, and are the practical embodiment of, the values of the communities that support and finance them. Agriculture that degrades soils, plants, animals, farmworkers, and farm communities reflects a culture in which convenience of life and cheapness of product are the primary concerns. It reflects a society in which people do not want to know, do not feel they *need* to know, the moral responsibilities and the practical skills necessary to maintain healthy lands and the flourishing of communities of creatures *at the same time*.

The care of the land and the nurture of human neighborhoods require detailed attention, time-honed insight and skill, sustained commitment and affection, and the humility to match human expectations and desires to the limits and possibilities of the places that feed, warm, and inspire us. This is to say that a change in agriculture presupposes a transformation of culture, a transformation of the personal sympathies and values that people hold, the economic priorities and social responsibilities they pursue, and the personal and communal goods they aspire to. Because eating is the most regular and intimate way that people connect to the land, the question of agriculture is always also a question about how people position themselves in the world, what they believe the world and its creatures to mean, and what they think is morally appropriate behavior within it. As I will show in this chapter, religion plays an important role in this work because religious belief and practice have traditionally been primary modalities in which people attempt to find clarity about fundamental and absolute values.

The transformation in culture and of values I am talking about is not going to be easy. Insofar as our time is defined by what some historians call the period of the “Great Acceleration,” we are each inspired and formed by desires and expectations for life that are wildly unrealistic and deeply damaging to the sources of life. Since roughly 1945, the developed economies of the world have been on a resource-consuming binge that is unprecedented in the history of the world, a binge that has decisively altered the way people engage their environments. As J.R. McNeill and Peter Engelke indicate, this spree in commodity consumption has been made possible by an explosion in the use of energy:

⁵ Ibid., 19–20 (emphasis added).

The enormous expansion of energy use in recent decades beggars the imagination. ... Our species has probably used more energy since 1920 than in all of prior human history. In the half century before 1950, global energy use more than doubled. Then in the next half century, it quintupled from the 1950s level.⁶

For millennia, people clearly consumed energy to feed, warm, and secure their bodies. The sources of this energy were closely tied to sunshine, plant growth, and the movement of water and wind. The rates of energy consumption were, therefore, clearly limited by natural rhythms. All of this changed with the burning of fossil fuels like coal, oil, and natural gas—each a product of millions of years of sunshine energy captured as carbon in the ground—and the development of an industrial, machine economy that could function as if there were no natural limits of any kind. The human economy thus became unmoored from ecological limits and possibilities. The only limit to economic activity was thought to be the limits of the human mind and human desire.

The story of this unmooring is long and complex and has many dimensions.⁷ One of its central strands or plot lines is how our modern economy's extractive character creates the understanding in us that the places and things of this world are commodities to be consumed. Almost everything, ranging from food and fiber to energy and ecosystems, has been reduced to a unit of production susceptible to the logics of efficient use and profitable sale. Must we see the world in this commodified way? Can such a world be our lasting home?

What I want to explore in this chapter is whether food production and consumption practices can play a role in the construction of an alternate understanding of and imagination for things. More specifically, can people recover a sense for the sanctity of living beings and thus also be inspired to develop agricultural practices and food economies that contribute to the nurture and healing of planet Earth? My central assumption is that a theological understanding of food and eating can play a significant role in a fresh evaluation of creatures and our life together, an evaluation that will better facilitate a shared life in our common home.

Rethinking the world of food

It is possible to name and narrate food in multiple ways. How we do it matters because the manner of our naming and narrating significantly determines how we are going to produce and consume it.

⁶ J.R. McNeill and Peter Engelke, *The Great Acceleration: An Environmental History of the Anthropocene since 1945* (Cambridge, MA: The Belknap Press of Harvard University Press, 2014), 9.

⁷ The literature on this topic is immense. For a look at how changing economies relate to changing ecosystems, see I.G. Simmons, *Changing the Face of the Earth: Culture, Environment, History* (Cambridge, MA: Blackwell Publishers, [1989] 1996); Andreas Malm, *Fossil Capital: The Rise of Steam Power and the Roots of Global Warming* (London: Verso, 2016); Jason Moore, *Capitalism in the Web of Life: Ecology and the Accumulation of Capital* (London: Verso, 2015); J.R. McNeill, *Something New under the Sun: An Environmental History of the Twentieth-Century World* (New York: W.W. Norton & Company, 2000).

If food is characterized as a commodity, for instance, the primary desiderata for our engagements with it will be matters like efficiency of production, cheapness of price, standardization of product, convenience of consumption, optimization of flavor, longevity of shelf life, ease of transport, and reliability of supply. That is to say, food, which might otherwise be understood primarily in terms of its biological and ecological features, and thus in terms of factors like seasonality, perishability, vulnerability to weather and disease, regional limits and potential, and the idiosyncrasies of *terroir*, is here made to function as an economic reality serving decidedly economic concerns.

The practical implications of this shift are immense because economic realities must be made to fall within a business plan that may or may not take adequate account of or sufficiently respect biological limits and possibilities.⁸ The result can be farming that maximizes yield while degrading the soil and water base, or the production of meat that degrades the animal life that provides it. Indeed, farms come to resemble factories, and food production a processing line.⁹ And the food produced by this system? The “success” of a food product has much more to do with increasing market share than it has to do with the nurture and health of the bodies fed by it.

As but one example of how a strictly business approach to food can lead to destructive and perverse results, consider how obesity has become immensely profitable to producers. In what food researcher Julie Guthman calls “the political economy of bulimia,” food company executives first create (and aggressively market) the food products that make people fat, and then they also create the commodity “solutions” that will help them diet: “In the interests of economic growth, contemporary US capitalism has helped to create obesity as a material phenomenon and then made it a moral problem that must be resolved in a way that is equally kind to capitalism.”¹⁰ Today’s dieting industry, with its many slimming products, is now a multibillion-dollar enterprise. In the political economy of bulimia, the health and integrity of bodies are denied so that they can be the targets of a market’s need for continuous, unending growth.¹¹

⁸ In his book *The End of Food* (New York: Houghton Mifflin Company, 2008), Paul Roberts argues that the commodification of food has certainly produced more calories than the world has ever seen. But it has also accrued costs to human and environmental health that we are barely beginning to understand, let alone account for. He concludes: “The very logic of the food economy is increasingly at odds with the biological systems, both human and natural, upon which that same food economy ultimately depends” (109).

⁹ For a history of the transformation of agriculture into a business and industrial enterprise, see Deborah Fitzgerald, *Every Farm a Factory: The Industrial Ideal in American Agriculture* (New Haven: Yale University Press, 2003). As Fitzgerald demonstrates, this transformation resulted in the physical transformation of landscapes, new forms of agricultural work, the demise of agricultural communities, and a new food culture in which eaters expected their food to be a standardized, uniform product available all times of the year.

¹⁰ Julie Guthman, *Weighing In: Obesity, Food Justice, and the Limits of Capitalism* (Berkeley: University of California Press, 2011), 163.

¹¹ Guthman shows how the need for a steadily growing market results in

the design of food products that do not act like food. Products such as Simplese, the substance used as fat in low-fat ice cream, or Splenda, the low-calorie sugar substitute, break right through the problem of inelastic demand. The commodity simply passes through—enabling the product to be consumed with no weight-gaining effect. For that matter, some of the new pharmaceuticals (e.g., Xenical) and nutritional supplements designed to reduce the body’s absorption of fat (along with essential vitamins and minerals) fulfill a similar function. By thwarting the body’s metabolizing functions, these products allow markets, but not necessarily waistlines, to expand, albeit with less than salubrious side effects. (Ibid., 181)

When food is named and narrated as a commodity or as fuel to keep our machine-like bodies functioning at an optimal level, the practical effect is to position humanity in the world as shoppers who purchase a world now understood to be a massive store or warehouse. The primary concern is to make sure the products are always available, preferably inexpensive and tasty (from the point of view of the shopper), or profitable and addicting (from the point of view of the producer). This naming and narration we now clearly see to be destructive to eaters and our common home. It assumes a positioning of humanity in the world as utility maximizers who can do with land and creatures whatever they desire. It assumes a characterization of life as devoid of the sanctity that calls forth in us humility, respect, and gratitude.

What might a theological naming and narration of food look like, and why would it matter? To answer the second part of the question first, a theological approach matters because theology is fundamentally about coming into an understanding of the world as a gift from God and persons as called to witness in their daily living to God's love for all creatures. From a theological point of view, creatures are never simply reducible to commodities because they are the material manifestations of a divine intention. In other words, the world is sacred. As such, a theological account continually prompts the question: what is the difference between receiving the world *as a gift* versus grasping the world *as a commodity*?

A theological account positing a God who creates and cares for creatures presupposes a fundamentally different positioning of humanity in the world. Persons are not the center of meaning and value. Nor does the world exist to serve personal ambition. Instead, God is the center as the One who in creating things also gives to them their sacred value and significance. Nothing is reducible to a commodity because each and every created thing is first and foremost a gift meant to be gratefully received and carefully handled and shared. What things "are," what they mean and signify, are determined by their relation to God as the One who gives them their freedom and life.¹²

If food is first and foremost a divine *gift*, then it makes sense to narrate food as the material expression of God's own love. Put directly, *food "is" God's love made nutritious and delicious*, and eating is humanity's participation in the extension of this divine love in the world.¹³ As we will see when we consider the action of eating itself, this is a costly love, because for any creature to eat, other creatures must die.

¹² It is important to stress that God creates in freedom *and* that God creates creatures to be free. A common mischaracterization of God's creative activity is to believe that God's power to create is a coercive power that diminishes creaturely freedom and integrity. It results in the view that, in order for God to be great, creatures must become small. This way of speaking rests on a fundamental mistake because it assumes that God and creatures share the same plane of reality and thus are in competition with each other. This is not the case. God's reality is of a fundamentally different kind than creaturely reality. This makes it possible for God to be present to each creature as its animating power and life without that power being coercive in any way. For creatures, to depend on God as the source of their life is liberating because God's power is fundamentally the power of love that seeks the full flourishing of creatures. For a brief and lucid account of the noncompetitive relation between God and creatures, see Kathryn Tanner, *Jesus, Humanity and the Trinity: A Brief Systematic Theology* (Minneapolis: Fortress Press, 2001).

¹³ I develop this theme more fully in *Food and Faith: A Theology of Eating* (New York: Cambridge University Press, 2011).

It is a strange way of speaking to narrate food as God's love made nutritious. To see why some Christians might formulate it this way, we first need to understand that the world registers as *God's creation*. The world is not a stockpile of "natural resources" waiting for humans to appropriate at will.¹⁴ It is the gratuitous, contingent, material manifestation of the divine desire that creatures should be and should flourish. As theologians through the ages have reflected on why God creates and why things exist, they have concluded that God did not need to create anything. The divine life is perfect in itself and in need of nothing. If God creates, it must, therefore, be the outflowing of a love that desires others to be and to share in the love that rejoices in life.

The divine love being talked about here is, I think, best understood in terms of the work of hospitality. God creates by "making room" for what is not God to be.¹⁵ God is the supreme Host who welcomes and makes a space for non-divine life to come into existence, and then commits to its nurture and flourishing through acts of care and empowerment.¹⁶ The existence of things in this world, indeed the whole world itself, is, therefore, the material manifestation of the divine love at work in them. Nothing has to be. That anything exists at all points to a divine intention that desires for things to be.¹⁷ All creatures, we might say, are God's love variously made visible, tactile, auditory, fragrant, and nutritious.

It is easy to miss the practical significance of the teaching of creation because many people, Christians included, think this teaching is primarily about how the world began a long, long time ago. Though it clearly matters that God be affirmed as the source of the world, it is equally, perhaps more important to affirm that God is constantly present to creatures as the animating and liberating power at work within them, inspiring them to live into the fullness of their lives. God does not create the world and then exit the premises. Rather, God abides with things as the love that enlivens, heals, and nurtures them.¹⁸

¹⁴ On the difference between nature and creation, see my book *From Nature to Creation: A Christian Vision for Understanding and Loving Our World* (Grand Rapids: Baker Academic, 2015).

¹⁵ Various theologians have developed this theme. Robert Jensen, for instance, writes: "For God to create is for him to open a place in his triune life for others than the three whose mutual life he is." Robert Jensen, "Aspects of a Doctrine of Creation," in *The Doctrine of Creation: Essays in Dogmatics, History, and Philosophy*, (ed.) Colin Gunton (Edinburgh: T&T Clark, 1997), 24. In *God in Creation: A New Theology of Creation in the Spirit of God* (Minneapolis: Fortress Press, 1993), Jürgen Moltmann draws on the Jewish teaching of *zimsun*, God's self-limitation, to create the space for creatures to be. "Before God issues creatively out of himself, he acts inwardly on himself, resolving for himself, committing himself, determining himself" (86).

¹⁶ In scripture, the foundational passage for this way of characterizing God is found in Genesis 2 where God is presented as the Essential Gardener who creates by enlivening and nurturing soil so that humans, plants, and animals can thrive.

¹⁷ The contingency of things, and their reliance on the love of God as the source of their being, prompted Christians to develop the teaching of creation *ex nihilo*, or creation "from nothing." For a lucid statement on the meaning of this teaching, see Ian McFarland, *From Nothing: A Theology of Creation* (Louisville, KY: Westminster John Knox Press, 2014).

¹⁸ In *Drama of the Divine Economy: Creator and Creation in Early Christian Theology and Piety* (Oxford: Oxford University Press, 2012), Paul Blowers shows how God's work of creating the world and all its creatures was understood by early Christian communities to be inseparable from God's work of healing and saving them. Though scripture speaks most often about Jesus's ministries to human beings, his work was clearly and early on understood to have cosmic reach and significance. A central passage in this regard is the Christ hymn in Col. 1:15–20 that speaks of Christ's ministry of reconciliation extending to all creatures in heaven and on Earth.

Christians can say these things because they see in Jesus's body and in his ministries the love of God that creates, redeems, and fulfills the lives of creatures. Jesus is the eternal, creative love of God made flesh in the mid of creaturely life. When Jesus encounters people who are hungry, he feeds them. When he sees them sick and hurt, he heals them. When he finds them under the possession of an evil, animating spirit, he exorcises them. And when he finds them alienated and alone, he befriends them. The "miracles" of Jesus are not interruptions of the laws of nature. They are, instead, acts of liberation that free creatures from the pain and bondage of hunger, illness, demon possession, and alienation. When Jesus encounters others, he sees in them the life that they could enjoy if the love of God was fully operative within them.

What does it mean to imagine food as the material means for the extension of God's love in the world? The earlier reflections on the meaning of creation indicate that food is fundamentally about creating relationships characterized by fellowship, sharing, and care. To appreciate food as a divine gift means, first of all, that life does not have to be. That we exist and that we have the potential to flourish suggests that at its core, food communicates something about the generosity and festivity of our life together. Food is the daily sign that eaters are asked to share in and share with others the life that is always being given. Before the miracle of life, we should be astonished. That the world we live in has the potential to taste so good is a sign that food is the regular invitation to people to delight in life's goodness and delectability.¹⁹ Food is never to be taken for granted or to be taken lightly. It is a precious, vulnerable, and costly gift. Being a gift, it is to be cherished, cared for, and celebrated.

Rethinking the action of eating

If the world and all its creatures are understood to be sacred, then a purely instrumental, utilitarian approach to them is called into question. Though creatures must "use" each other to live—most basically through eating—human use must always be informed and chastened by the knowledge that creaturely sanctity and integrity requires our respect and care.

The "use" of others for food has long been at the heart of deep philosophical and religious thought, because for any creature to eat, others must die. How do people become worthy of consuming another's life? How do we honor their life as a gift, while at the same time bring their life to an end?²⁰

¹⁹ The toast of the episcopal priest and cook Robert Farrar Capon communicates this sentiment precisely:

To a radically, perpetually unnecessary world; to the restoration of astonishment to the heart and mystery to the mind; to wine, because it is a gift we never expected; to mushrooms and artichoke, for they are incredible legacies; to improbable acids and high alcohols, since we would hardly have thought of them ourselves; and to all being, because it is superfluous.... We are free: nothing is needful, everything is for joy. Let the bookkeepers struggle with their balance sheets; it is the tippler who sees the untipped Hand. God is eccentric; He has *loves*, not reasons. *Salute!*

Robert Farrar Capon, *The Supper of the Lamb: A Culinary Reflection* (New York: The Modern Library, 1967), 85–6.

²⁰ In *Food and Faith*, I give a more detailed examination of these questions.

When considering these questions, it is important to recall that religious traditions have emphasized the need for their adherents to adopt a sacrificial posture in the world. A sacrificial posture can take many forms, as when people erect altars or build temples for the sacrificing of domestic animals and the fruit of the land, or when they are asked to give of themselves—their time, energy, skill, or money—so that others might be served.²¹ At its core, however, is the impulse not only to give the offering but also to give oneself to the god. Of these two offerings, the more fundamental is the self-offering because in the offering of oneself, a new posture in the world is achieved. It is this posture that we most need to understand, particularly in a time like our own when agricultural lands and farm creatures are being degraded or destroyed.

Sacrificial self-offering communicates that we do not presume life to be a possession that we can do with as we please. Not only must people be prepared to give up the plant and animal life they need to survive, by offering it to the god, they must also commit themselves to the care of the creatures they live among and depend upon. This is why the biblical prophets were so quick to denounce false sacrifice. Sacrifice is true if it results in the transformation of peoples so that they become charitable and kind, willing to serve the needs of others. It is false if it leads to the degradation or oppression of one's community's members. A sacrificial disposition, in other words, trains people not to presume upon life or treat it as a possession or commodity that we can do with however we please. It teaches that life is a precious gift that must be received with care and respect.²² Far from being an abstraction, the care and respect envisioned here is made real in forms of agriculture that promote the health of soil, the cleanliness of water, the fertility and health of plants and animals, the just treatment of farmworkers, and the honoring of eaters—by providing nutritious food.

Industrial eating can be described as non-sacrificial eating because it suggests that the appropriate way to relate to others is in terms of convenience and control. The world of food exists to be managed so that a minimum of attentive care and a maximum amount of benefit are achieved. Soils, waters, the atmosphere, plants, animals, farm workers, farmers, food service providers, eaters—all can be exploited, exhausted, and degraded so long as food is plentiful and relatively inexpensive. This is a form of eating that places almost no demands on its eaters. They need to have no knowledge of what is required for the production of healthy food, no skill in the growing and preparing of food, and no sympathy for the fate of creatures that make a meal possible. All they

²¹ Jeffrey Carter has gathered a diversity of perspectives in *Understanding Religious Sacrifice: A Reader* (New York: Continuum, 2003).

²² It is tempting to think that vegetarian or vegan eating overcomes the problem of eating *through* death or that a salad bar is a morally unproblematic zone. I believe this is a mistake because it underestimates the value of plant and microorganismic life and the complex interactions between plants and animals. Clearly, not all deaths are the same. What we need, moving forward, is a much more nuanced reflection on the role of death in the membership of life and an understanding of death that does not focus solely on the extinction of individual or even species beings (an immense topic that cannot be developed here). It is also important to note that death within a sacrificial context takes on a vastly different meaning than death in the contexts of militarism and exploitation. That so much meat is now being produced in egregious, life-demeaning ways means that a more vegetarian diet is certainly to be recommended. But it is also important to remember that viable ecosystems are always populated by plants and animals (among other creatures) and that a healthy agriculture must reflect this ecological principle.

must do is show up at the store or restaurant and perform a credit card swipe. This is a food economy that is saturated with anonymity and ignorance. It is what the Kentucky farmer, poet, and philosopher Wendell Berry once called an economy of the one-night stand. People engage in the transaction to have a good time. They do not ask for names, nor do they want to be responsible for the effects of what they do. It is a transaction that happens mostly in the dark.²³ The result of this ignorance is a food economy and modes of eating and food production in which people find it difficult to do the things that honor and cherish the creatures that make eating possible. It is eating in which the refrain “Amen. Let it be so!” is hard to utter, either because we don’t know if the food on our plate honors life or because we do know that the food we are about to consume testifies to a history of carelessness, abuse, or injustice.

Does eating need to be this way? Can a theological vision inspire people to a better way? I think it can, and to see how this might be so, we can turn to one of Christianity’s central rituals, the sharing of a meal called the Lord’s Supper or, more generally, the Eucharist.

Christian traditions have practiced and understood this meal in various ways, not all of them of equal help for the purposes of this discussion. This is why it is helpful to begin with an arresting passage in scripture where Jesus speaks of himself as food to be eaten so that people fed by him can be inwardly transformed and empowered to live the life of care that he models and makes possible.

In John 6, Jesus calls himself the “bread of life.” His pronouncement follows having just miraculously fed five thousand people who have come to hear him. People are following Jesus because he performs signs that bring healing to life. They want even more of him now that they have seen him turn a few loaves and fish into enough food to feed thousands. They want to make him their king because what can be more powerful or more useful than to provide food on demand? But Jesus is not interested in that. He tells them that they are thinking in the wrong sorts of ways. What they really need is not the kind of food that temporarily satisfies a gustatory need. Instead, they need the food that reorients their life altogether so that together they will become people who care for each other and provide for each other’s needs. And the only way that can be possible is for them to develop the disciplines of love and care that he has spent his whole ministry modeling to them. Jesus, in other words, needs to enter their lives so that he can redirect them from the inside to lead lives of attention and service to others.

There is no better way to describe the radical character of this reorientation than to go to the gut, the place that nourishes people with the energy they need to move. Using graphic language, Jesus says,

Very truly, I tell you, unless you eat the flesh of the Son of Man and drink his blood, you have no life in you. Those who eat my flesh and drink my blood have eternal life, and I will raise them up on the last day; for my flesh is true food and my blood is true drink. Those who eat my flesh and drink my blood abide in me, and I in them. (John 6:53–56)

²³ Wendell Berry, “The Whole Horse,” in *The Art of the Commonplace*, (ed.) Norman Wirzba (Washington, DC: Counterpoint, 2002), 236.

There is a great deal that can and needs to be said about this passage, but what is most important for our purposes is to understand that Jesus is referring to himself as our food because when we are nourished by him, we become empowered to live the kind of life he makes possible. His blood (recalling that in ancient Israel, blood represented the power of life), when consumed by us, acts like a transfusion that puts our life on a sacrificial and non-self-centered path, a path that is all about offering oneself for the good of others. His flesh, meanwhile, acts as the muscle and mass that moves and nurtures us along the way.

It is tempting to dismiss this episode as a disgusting flirtation with cannibalism. This is a mistake. Jesus speaks this intensely because he wants to communicate how radical the reorientation in life is that he is calling his followers too. To take up Jesus's loving ways in and for the world, it is not enough to simply have a few new ideas about life. Jesus must enter minds, but even more fundamentally, Jesus must enter our guts as the bread of life that transforms and nourishes our whole body. So intense is the co-abiding that Jesus seeks from his followers. If Jesus is not inside people at the most fundamental and intimate levels, it is unlikely that they will be able to love and live like he did.

What does any of this have to do with food and agriculture or with the care of our common home? Quite a lot, because a central Christian claim is that it is the love of God in Jesus that redeems and reconciles the world. Though some Christians may believe that Jesus's primary objective is the rescue of individual souls and their sending to a faraway heaven, such a view has little scriptural support. As one of the earliest Christian summaries of the significance of Jesus makes plain, God is interested in the reconciliation of all creatures in heaven and on Earth (Col. 1:15–20). The logic of creation makes this plain: the divine love that creates everything is the very same love that does not abandon anything to destruction or oblivion but instead commits to the healing and redemption of all. To be a follower of Jesus is to become the sort of person who seeks the flourishing of every creature as a witness to God's love at work within it. God's hospitable desire, as we have already noted, is to create the conditions in which creatures can be welcomed and nurtured into the fullness of their life. The work of Christians is to participate in this hospitable modality and, in doing so, extend and embody the "good news" that has been proclaimed "to every creature under heaven" (Col. 1:23).

We can now see that Christian participation in the Eucharist ought to have the effect of repositioning and reorienting humanity in the world. Rather than approaching the land and its creatures with the aim to exploit and possess, those inspired and nurtured by Jesus are asked to attend to and serve the needs of others. They are asked to learn to come alongside others in a posture of solicitude and then witness together to lives of shared hospitality. As we have seen, this is a difficult hospitality because the care of others also entails the eating of them. Insofar as creatures must eat to live, the death of others is inescapable.²⁴ The question that remains is whether people will honor their death by respecting and caring for their life before death comes.

²⁴ Soul–body dualism and gnostic flight in face of the entangled, suffering, embodied life have been two primary strategies of avoidance of death in Western thought. Historically speaking, it is also worth noting that advocates of vegetarianism have sometimes assumed a dualist anthropology. See Colin Spencer, *Vegetarianism: A History* (New York: Four Walls Eight Windows, 2002), and, from a theological point of view, David Grummet and Rachel Muers (eds.), *Eating and Believing:*

Historically speaking, few Christians have understood the width and the breadth, or the inclusiveness, of this gospel vision,²⁵ which is why many would be surprised, perhaps even put off, by something like a “Christian agriculture” or a “Christian food system.”²⁶ My aim in the remainder of this chapter is not to give a precise or exhaustive blueprint for such an agriculture or food system. It is, instead, to suggest some practical principles and steps that the theological vision I have briefly articulated would recommend.

A first priority should be to turn agriculture and food economies to an appropriate scale, one that breaks through today’s anonymity and affords better clarity about what is happening “on the ground” and that accepts responsibility for the harm that is being done to land and creatures. This means that trends to further consolidation and longer production and consumption lines need to be resisted and replaced with local food systems, smaller farms, and regional processing and distribution centers. The distance between producers and consumers, producers and suppliers, suppliers and growers, and growers and the land needs to decrease because affection cannot be exercised in contexts of blindness and ignorance. If Jesus’s primary mandate is to learn to love creatures and the places of creation by becoming more hospitable, then a nonnegotiable prerequisite is that people learn the postures of attention and humility and the practices of good work that make love operational (and that move it from being merely a pious sentiment).²⁷

A second priority would be the promotion of a more educated eating population and more democratic participation in the food produced and consumed. Today’s growing urban population is the most ignorant assortment of eaters the world has ever known. People need to understand what is required to produce good and healthy food, and they need to know how to evaluate food in terms beyond narrow terms of utility. Farmers and gardeners need to be honored and properly compensated for the good work they do (that includes changing government support structures that currently subsidize corporate producers of commodities but mostly ignore smaller-

Interdisciplinary Perspectives on Vegetarianism and Theology (London: T&T Clark, 2008) for further treatment of this theme. Put theologically, the crux of the issue can be stated in the form of a question: will resurrected bodies eat other bodies? I offer some preliminary reflection on this question in chapter 7 of *Food and Faith*.

²⁵ A notable exception to this tendency can be found in some early Christian communities and churches associated with the Orthodox tradition that spoke of the need to “church” the world. The ministry and mission of the church extends beyond humans to include other creatures and their places of life because Jesus is the Head of the Church and the Lord over all Creation. For more on this theme, see Anestis Kesolopoulos, *Man and the Environment: A Study of St. Symeon the New Theologian*, trans. Elizabeth Theokritoff (Crestwood, NY: St. Vladimir’s Seminary Press, 2001), 152–62.

²⁶ In *Making Peace with the Land: God’s Call to Reconcile with Creation* (Downers Grove, IL: IVP, 2012), I (along with Fred Bahnson) describe several faith-based agriculture ministries that reflect the sensibility described in this chapter. See also Fred Bahnson, *Soil and Sacrament: A Spiritual Memoir of Food and Faith* (New York: Simon & Schuster, 2013) for further examples of faith-based food ministries.

²⁷ No one has written as clearly about this as Wendell Berry in his essays, poetry, and fiction. His classic statement of the culture needed for a healthy agriculture is *The Unsettling of America: Culture and Agriculture* (San Francisco: Sierra Club Books, 1977). For his insights on the importance of local economies, see the essays collected in *The Art of the Commonplace*, especially “The Idea of a Local Economy” and “Solving for Pattern.”

scale growers of food). And eaters need to take a more active role in stipulating what kind of food should appear in stores and in cafeterias and thereby wrest some of the control that has been taken by business interests that do not have land, animal, and human health as their first priority. People need to understand that something like the USA Farm Bill is also a health bill and an environment bill.

A third priority would be for religious communities to turn their memberships into mobilizers for change. If my claim that Christians are called to “church” the whole world is true, then it makes sense that congregations should be interested in things like Church Supported Agriculture or hosting centers for farmer’s markets and food distribution work. The land owned by congregations could be made available to aspiring gardeners and farmers who want to grow food and community relationships. Churches could partner with farmers, give them their financial support, and receive good food and an education in return.²⁸ The room for creative partnerships and ventures is great once people understand the importance of healthy food for a good life and a flourishing home.

I do not claim in this chapter that it is only Christians who, through their food production and consumption practices, will bring healing to our common home. It is clear that the world’s diverse religious traditions have their own unique ways to contribute.²⁹ What is needed in today’s food economies are the moral and spiritual voices that can bring critique to the instrumentalizing, utility maximizing ways of today’s global, industrial food system and that can inspire the kind of care that leads to the nurture and healing of the diverse bodies that constitute our common home. For this effort, the theological vision I have provided can play a role.

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²⁸ Some of this work is profiled in the work of the Alliance of Religions and Conservation, particularly their Faith in Food initiative (see <http://www.arcworld.org/projects.asp?projectID=520>).

²⁹ See Todd LeVasseur, Pramod Parajuli, and Norman Wirzba (eds.), *Religion and Sustainable Agriculture: World Spiritual Traditions and Food Ethics* (Lexington, KY: The University Press of Kentucky, 2016).

Part Five

New Directions

Law for and from the Natural World

Mary Ellen O'Connell with Marie-Claire Klassen

Humanity's earliest attempts to protect the natural world have combined theological, philosophical, scientific, economic, and legal concepts. As the 2015 Paris talks on climate change demonstrated, law is currently the most important, readily available means for putting ideas with global impact into action.¹ At the same time, law is only as effective as our commitment to it allows. The greater our respect for law, the more successful it can be as a tool for accomplishing our goals. Attracting respect for law is a continuous, essential challenge. Significant rules on peace, human rights, and the environment are widely disregarded, creating vast suffering, especially for the poor and the vulnerable of the planet. Leaders in the United States, Russia, China, and other states are renouncing international obligations rather than seeking improved compliance. The consequences of such disregard may be more significant than at any time in history.

This chapter looks at one factor in improving law compliance: the decline of long-held assumptions as to why anyone *should* obey legal rules. By the late nineteenth century, legal realists were questioning basic assumptions about law. They were followed by critical legal scholars and postmodern theorists. Participants from each of these movements exposed internal contradictions in Enlightenment thinking respecting law, yet failed to supply answers, including reasons to comply.²

Answers did emerge from outside the legal field, particularly economics. Economic theory of law, known as "law and economics," has become the prevailing legal theory in United States law schools and increasingly beyond the United States.³ Unquestionably, economics is an important consideration for legal theorists. Yet, our thesis is that economics does not offer answers to fundamental legal questions, such as why law binds when it provides no tangible personal gain.⁴ Without an answer to this question, the legal protection of common goods, such as a healthy environment, will remain weak.

¹ The Paris Agreement on Climate Change is a protocol to the 1992 United Nations Framework Convention on Climate Change. For more on both agreements, see <http://unfccc.int/2860.php>.

² See Stephan Smith, *Law's Quandary* (Cambridge: Harvard University Press, 2004).

³ For more on the rise of law and economics, see Francesco Parisi and C.K. Rowley, (eds.) *The Origins of Law and Economics: Essays by the Founding Fathers* (Cheltenham: Edward Elgar, 2005).

⁴ See Nicole Roughan, "Mind the Gaps: Authority and Legality in International Law," *European Journal of International Law* 27.2 (2016): 329; Samantha Besson, "The Authority of International Law—Lifting the Veil," *Sydney Law Review* 31 (2009): 343.

Theologians once supplied reasons for compliance, as well as the objects and purpose of law. Theology, however, has declined as a source of answers to questions of legal theory.⁵ This chapter will show how economic theories of law that prevail today are insufficient to fill theology's former role. A better theory can be built by looking again, not to theology per se but to a new source of inspiration for theologians that can inspire legal theorists as well. Contemporary theology is looking to aesthetics, the study of beauty, as a path to God. Aesthetics can also supplement economic approaches to law. As will be discussed later, law and economics teaches wealth maximization as the guiding principle for why and how to do law, but the environment needs an approach that persuades human beings to act for the good of others and nature where no short-term or even long-term benefit to the self can be perceived. The theory proposed in this chapter builds, in a very preliminary way, on theological aesthetics to understand the value of being other-oriented. Aesthetics supplies economics with reasons as to why anyone should limit her own self-interest to protect wildlife, vistas, the oceans, or other common spaces. The theory proposed in this chapter is one that should appeal to believers and nonbelievers alike in providing persuasive answers to the question: why obey law beyond economic self-interest?⁶ A theory of legal authority built on beauty offers a persuasive answer and can thereby revive law's capacity to protect the natural world, our common home.

Religion and economics as reasons for law compliance

Readers of this book will understand the urgent need for effective international environment law. This section provides examples of the law that currently exist and discusses why current law has not done a better job of effectively responding to environmental devastation. To some extent, the problem is in need of better substantive law.⁷ Yet, regardless of how good rules for environmental protection are, the greater problem may lie in commitment to, and compliance with, law that requires a good measure of altruism. The world lacks an overarching, general ecosystem-wide treaty on environmental protection. It also lacks a powerful institution with a mandate to respond to the crisis of the environment. The United Nations Environment Program exists but hardly compares with, for example, the World Trade Organization (WTO).⁸ Nevertheless, the more critical problem is not with the substantive law or institutions but with the lack of respect for law.

As international environmental challenges have emerged, sovereign states have adopted treaties and created institutions in response. The United Nations Convention

⁵ Theology has not been wholly excluded from legal theory. Consider the blend of theology and law in contemporary theocracies such as Iran, Israel, Tibet, and the Holy See. See also *infra*, 4–5.

⁶ See *infra*, 22–3.

⁷ For a comprehensive treatment of international environmental law, see Philippe Sands and Jacqueline Peel, *Principles of International Environmental Law*, 3rd edn. (Cambridge: Cambridge University Press, 2012).

⁸ The United Nations Environment Program (UNEP) is only a program of the United Nations (UN) while the World Trade Organization (WTO) is a UN specialized agency. One major difference is seen in funding. Programs must rely on voluntary contributions; sovereign state members of specialized agencies are assessed dues.

on Protection of the Ozone Layer and its Montreal Protocol have worked particularly well.⁹ The ozone treaty regime demonstrates the capacity of international law to protect the environment but is seemingly an exception. More typical is the case of China in July 2016 in which China lost a major arbitration to the Philippines.¹⁰ A tribunal established under the UN Convention on the Law of the Sea (UNCLOS) found, among other wrongdoing, that China was violating its obligations to protect the marine environment.¹¹ China denounced the decision. The United States called on China to comply, but China responded by pointing out that the United States, unlike China, is not a party to UNCLOS and is hardly able to complain about any alleged noncompliance by China.¹²

Compare this with the fact that the United States and China are both party to the WTO. Each has lost important cases before the WTO dispute settlement body. Each has complied with those decisions.¹³ This example indicates a willingness of states to comply with law where short-term self-interest is clear. Climate provides another example. The Paris Climate Agreement of 2015 replaces the Kyoto Protocol to the United Nations Framework Convention on Climate Change.¹⁴ Kyoto mandated binding greenhouse gas emissions levels. The United States never agreed to Kyoto. China did but only because of the weak obligations imposed on “developing states.” The United States and China both initially committed to the Paris Agreement and submitted national emissions restrictions goals. Again, however, it is a weak agreement in which parties develop their own greenhouse gas emissions limits. The goals submitted by the

⁹ See Aaron Sidder, “Remember the Ozone Hole? Now There’s Proof It’s Healing,” *National Geographic*, June 30, 2016. Online: <http://news.nationalgeographic.com/2016/06/antarctic-ozone-hole-healing-fingerprints/> (accessed July 14, 2016). For the text of the primary treaty on protection of the ozone layer and the protocol to it, see UNEP, “Vienna Convention on the Protection of the Ozone Layer” (1985). Online: <http://ozone.unep.org/en/handbook-vienna-convention-protection-ozone-layer/2205> (accessed July 14, 2017). See also the “Montreal Protocol on Substances that Deplete the Ozone Layer” (1987). Online: <http://ozone.unep.org/en/handbook-montreal-protocol-substances-deplete-ozone-layer/38> (accessed July 14, 2017).

¹⁰ See Tom Philips, Oliver Holmes, and Owen Boycott, “Beijing Rejects Tribunals Ruling in South China Sea Case,” *Guardian*, July 12, 2016. Online: <https://www.theguardian.com/world/2016/jul/12/philippines-wins-south-china-sea-case-against-china> (accessed July 12, 2017).

¹¹ See *In the Matter of the South China Sea Award*, PCA No. 2013–19 (Phil v. China), July 12, 2016, especially part VII D 6(c) & (d). Online: <https://pca-cpa.org/wp-content/uploads/sites/175/2016/07/PH-CN-20160712-Award.pdf> (accessed July 12, 2017). In paragraph 16 of the holding, the Tribunal found that China has among other violations of UNCLOS “caused—through its land reclamation and construction of artificial islands ... —severe, irreparable harm to the coral reef ecosystem” (*ibid.*, 476).

¹² See Katie Hunt, “South China Sea: Court Rules in Favor of Philippines over China,” *CNN*, July 12, 2016. Online: <http://www.cnn.com/2016/07/12/asia/china-philippines-south-china-sea/> (accessed July 14, 2016).

¹³ See, for example, United States Trade Representative (USTR), “Report to Congress on China’s WTO Compliance” (December 2015). Online: <https://ustr.gov/sites/default/files/2015-Report-to-Congress-China-WTO-Compliance.pdf> (accessed July 12, 2017).

¹⁴ Framework treaties, like the UN Convention on Climate Change, are drafted with the understanding that at a later time, additional agreements will be added to the main treaty in the form of protocols. Under international law and within national law, these additional agreements are treaties in their own right. The United States follows a practice where important, obligation-rich protocols require the same two-thirds senate majority as a treaty.

United States, China, and other states will not achieve the Paris Agreement's goal of holding temperature rise to two degrees Celsius above preindustrial levels.¹⁵

Climate change is a case where the best prospect for amelioration rests on robust legal mandates that attract wide compliance. Such mandates are unlikely, however, to offer short-term benefits and will need a persuasive argument about the authority of law. At one time, international law had a strong theory of authority. For centuries, legal scholars understood that complying with law for the common good was a command of God. In *Law and Revolution*, Harold Berman writes: "The fundamental concept of the Western legal tradition [is] ... the concept of a society that has the power to transform itself in time by the rapid and continuous infusion of divine and natural law into ecclesiastical and secular legal institutions."¹⁶ For Berman, the core of the Western legal system is not only a demand for the consent of those subject to the law but also a grounding of the law in divine command. The connection between law and God provided compelling grounds for the authority of law.¹⁷

With the Reformation and the Enlightenment that followed in Europe, theology faded from legal theory in the West. Both intellectual movements helped usher in the age of science and answers to fundamental questions based on scientific method. With the rise of science in Europe and North America, theological answers to legal questions have become unpersuasive. While it is true that within Islam, Judaism, Buddhism, animism, and some other religious traditions theology is intertwined and even coextensive with law, as far as Western and international law are concerned, theology is likely to remain suppressed as a source. International law, perhaps more than any other body of law, must find its answers outside any one religion. By contrast, economics has growing appeal within international law in part for the very reasons that it is secular, universal, and provides persuasive explanations of human behavior.

Economic frameworks limit values and proposals to the search for the best means to the end of wealth. Decisions are keyed to their utility for wealth maximization, a factor termed "efficiency." The historian Brad Gregory sees the rise of economics as filling the gap in the West's ethical frame. Gregory argues that in the West, each individual is "free to choose self-absorbed, consumerist self-construction as one's good" without regard to the good of others.¹⁸ What previously constituted an approach incorporating the common good in social policy, politics, and law, derived from an understanding of God in the world, has been replaced with the neoliberal market, consumer choice, and individual self-interest.

By the 1960s, religious influences in law through, for example, direct invocations of natural law theory, had come largely to an end.¹⁹ Ronald Coase, a British economist,

¹⁵ Camila Domonoskoe, "2 Degrees, \$100 Billion: The World Climate Agreement by the Numbers," *NPR* (December 12, 2015). Online: <http://www.npr.org/sections/thetwo-way/2015/12/12/459502597/2-degrees-100-billion-the-world-climate-agreement-by-the-numbers> (accessed July 12, 2017).

¹⁶ Harold Berman, *Law and Revolution* (Cambridge, MA: Harvard University Press, 1983), 197.

¹⁷ See also Jeffrey Stout, *Democracy and Tradition* (Princeton: Princeton University Press, 2005).

¹⁸ Brad Gregory, *The Unintended Reformation* (Cambridge, MA: The Belknap Press of Harvard University Press, 2012), 296.

¹⁹ Among legal theorists, John Finnis stands out in this period as an exception. John Finnis, *Natural Law and Natural Rights*, 2nd edn. (Oxford: Oxford University Press, 2011).

was a key figure in moving economic theory into the space left by the abandonment of natural law. Coase published an article in 1960 on how law influences certain financial costs to society. From this early work, he, along with his University of Chicago colleague Judge Richard Posner, came to see economic analysis of law as providing “the analytical rigor necessary for the study of the vast body of legal rules present in a modern legal system. This intellectual revolution came ... when legal academia was actively searching for a tool that permitted critical appraisal of the law, rather than merely strengthening ... dogmatic consistencies.”²⁰ The work of Coase, Posner, and others gave rise to the “law and economics” movement, which promotes the evaluation of law based on efficiency or wealth maximization. Law and economics has succeeded dramatically in transforming legal theory.

According to Posner: “Wealth maximization combines elements of utilitarianism and individualism, and in so doing comes closer to being a consensus political philosophy in our contentiously pluralistic society than any other overarching political principle.”²¹ Posner sees conduct in the market demonstrating that wealth maximization is an objective measurable standard against which to evaluate law. Francesco Parisi, too, argues that in the absence of clear moral or ethical theories of justice “efficiency provides the most appropriate criterion for allocating limited resources among competing claims.”²²

One of the weaknesses of the law and economics approach, however, is the well-known fact that while certain laws may result in greater wealth as a general matter, it is typically the case that participation in wealth created in a market economy is not distributed uniformly across society. Market economies are competitive, meaning that while some do well, it is often at the expense of others, a zero-sum game. Law and economics theorists are now positing that while the market may work well for the wealth maximization of some, all individuals, even wealthy ones, need things that cannot be acquired on their own known as “public goods.” These goods require cooperation, which is best fostered through institutions of governance. At the international level, the World Bank and other global institutions have identified a list of “global public goods” that are needed for all of society. The list includes protecting the environment, tackling “communicable diseases (including HIV/AIDS, tuberculosis, malaria, and avian influenza), international trade, [reform of the] international financial architecture, and global knowledge for development.”²³ The logic of the market, however, counsels against cooperating to acquire public goods collectively. “Free-riding” is identified as

²⁰ Francesco Parisi, “Methodological Debates in Law and Economics: The Changing Contours of a Discipline,” in *The Origins of the Law and Economics*, (eds.) F. Parisi and C.K. Rowley (Cheltenham, UK: Edward Elgar Publishing, 2005), 35.

²¹ Richard Posner, “Wealth Maximization Revisited,” *Notre Dame Journal of Law, Ethics and Public Policy* 2 (1985): 85, 104.

²² Francesco Parisi, “Methodological Debates in Law and Economics: The Changing Contours of a Discipline,” in *The Origins of the Law and Economics*, (eds.) F. Parisi and C.K. Rowley (Cheltenham, UK: Edward Elgar Publishing, 2005), 47.

²³ World Bank, *What Are Global Public Goods?* (2008). Online: <http://go.worldbank.org/JKZLIHR2B0> (accessed April 30, 2016). See also Fabrizio Cafaggi and David Caron, “Global Public Goods amidst a Plurality of Legal Orders: A Symposium,” *European Journal of International Law* 23 (2012): 643.

the problem where a single individual need not contribute to the global public good but can still benefit from the efforts of others. From an individual's perspective, free riding is a good to be sought.

At the national level, government is seen as the institution that can overcome free riding and other barriers to ensuring public goods. Without government at the global level, international law is the best available tool for coordination to realize common interests.²⁴ Individuals involved in law making at the national or international level are, again, drawing on their available sources of values, especially the tradition of religion as explained earlier. Nonetheless, economic values persist. Even those worried about the unfairness of the market or the need to develop public goods seem to have no compelling alternatives.

Economics and environment

The approach of law and economics is failing to develop attitudes toward law that can effectively protect the environment and may even be encouraging environmental damage. Pope Francis draws a similar conclusion in *Laudato Si'* when he calls on the world "to seek other ways of understanding the economy and progress" as a critical change needed to save the planet.²⁵ Protecting the environment is imperative even if it is not a wealth generator.²⁶

For example, the Kyoto Protocol assigned economic value to the reduction of greenhouse gases. The protocol included three market-based mechanisms: emission credit trading; joint implementation ("JI," which allowed for participation in emissions reductions in other countries to earn emissions reductions units), and the clean development mechanism ("CDM," which allowed for emission-reduction credits). The use of market-based instruments was promoted as achieving the dual aim of lowering greenhouse gases while generating wealth. The market mechanisms, however, were not sufficiently attractive to entice the United States or China to take the action essential to reduce greenhouse gases toward needed limits. Kyoto failed. The Paris Agreement also includes market mechanisms but relies centrally on the need to limit temperature rise, rather than wealth maximization.²⁷ The Paris Agreement, however, like all law today, has little by way of an express rationale for compliance that is able to counter the appeal of wealth maximization.

Economics, with its focus on the self and acquisition, is heavily anthropocentric. Ushra Natarajan argues that our concept of freedom is linked to consumption. Law that

²⁴ Daniel Bodansky, "What's in a Concept? Global Public Goods, International Law, and Legitimacy," *European Journal of International Law* 23 (2012): 651.

²⁵ Pope Francis, *Laudato Si': On Care for Our Common Home* (May 24, 2015), §5. Online: http://w2.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si.html (accessed July 12, 2017).

²⁶ Harro Van Asselt, Michael Mehling, and Clarisse Kehler Siebert, "The Changing Architecture of International Climate Change Law," in *Research Handbook on Climate Change Mitigation Law*, (eds.) Geert Van Calster and Wim Vandenbberghhe (Cheltenham: Edward Elgar Press, 2015), 3.

²⁷ Daniel Bodansky, "The Paris Climate Change Agreement: A New Hope?" *The American Journal of International Law* 110, no. 2 (2016): 288-319. doi:10.5305/amerjintlaw.110.2.0288.

privileges the human person's right to things "systemically devalues the non-human."²⁸ We are "profoundly disconnected from knowing ourselves as a species inextricably interconnected with other organic and inorganic life."²⁹ We tend to separate nature from ourselves and view it as an object, a tool for our use as dictated by economic values.

The economic orientation to law also promotes the idea of unlimited growth as a positive value. The notion that development is tied to infinite progress appears to be uniquely Western.³⁰ The idea of "limitlessness" grew out of the Enlightenment and led to assumptions that have shaped many of our modern institutions. As environmental treaties are currently negotiated, they are based on an underlying belief in the value of limitless economic growth. Kathleen McAfee finds "green developmentism" at institutions such as the World Bank and in treaties like the Convention on Biological Diversity (CBD), where nature is a kind of currency: "This global environmental-economic paradigm reduces organisms and ecosystems to their allegedly fungible components and assigns monetary prices, calculated with reference to actual or hypothetical markets."³¹ She argues that the CBD guarantees continued "Northern access to Southern ecosystems and resources as sources of primary commodities and of 'genetic resources' for their own agrochemical, pharmaceutical, and other biotechnology industries."³² She highlights that articles 1, 15, and 19 all stress sharing equally the "benefits of biodiversity," with article 1 specifically emphasizing the economic benefits.³³ Ultimately, this framework "devalues the intricate ecological and social relationships in which biological diversity is embedded."³⁴

The result is that the international legal system is often "structured in ways that systemically reinforce ecological harm."³⁵ Attempts to address environmental decline create the appearance of addressing the problem while at the same time reinforcing the underlying economic structures, which are the cause of harm in the first place. Natarajan argues that we need to shift our perspective and adopt "a legal concept that asserts the limits of natural growth."³⁶

The shift toward economic values, both at a wider societal level and within the law, has negative implications for the environment. Economic reasoning and values are posing obstacles to the law we need in order to protect the natural world as a good in and of itself, separate from its potential "market value."

²⁸ Ushra Natarajan, "The Marriage of Human Rights and the Environment: from Mutual Convenience to Irreconcilable Differences," in *International Research Collaborative (IRC) on Resource Governance, Inequality and Human Rights* (New Orleans: Law and Society Association, June 2–5, 2016), 22.

²⁹ *Ibid.*

³⁰ Ushra Natarajan and Kishan Khoday, "Locating Nature: Making and Unmaking International Law," *Leiden Journal of International Law* 27 (2014): 588.

³¹ Kathleen McAfee, "Selling Nature to Save It? Biodiversity and Green Developmentism," *Environment and Planning D: Society and Space* 17 (1999): 134. Online: <http://globalseminarhealth.wdfiles.com/local-files/pharmaceutical-harvesting/McAfee.pdf> (accessed July 12, 2017).

³² *Ibid.*, 141.

³³ *Ibid.*, 143.

³⁴ *Ibid.*, 141.

³⁵ Natarajan and Khoday, "Locating Nature," 574.

³⁶ *Ibid.*, 591.

Theology and beauty

We saw in the last section how economics has failed to provide a sufficiently solid foundation for the law, in particular environmental law. This section considers aesthetic theory as a supplement to economic theory in explaining legal authority. Theologians are rediscovering the role of beauty in aesthetic theory as a path to the divine. Their work inspires this new look at aesthetics for reviving respect for law that aims to protect the other, including the natural world.

The teaching associated with Plato and Aristotle played a significant role in early Christian theology and continues to do so in contemporary aesthetic theory. In the *Phaedrus*, Plato notes that sight is the most immediate of our senses, and, as a result, beauty is the most accessible transcendental. In the *Symposium*, Plato describes our experience of beauty as a ladder. Love (*eros*) of the beautiful helps us ascend from lower rungs of the ladder to the higher—from physical beauty, to beautiful actions, and ultimately to beauty itself, which discloses goodness and truth. In the *Philebus*, Plato argues that the good consists of three things: beauty (καλὸν), symmetry (συμμετρία), and truth (ἀλήθεια). Consequently, truly “seeing beauty” means also seeing the true and the good. Similarly, Aristotle understood beauty to be objective, defined by the characteristics of “order, symmetry and definiteness.”³⁷ The *Nichomachean Ethics* shows the connection between beauty and virtuous action by defining virtue as aiming at the mean—in other words, the symmetry that defines beauty.

This connection continued in the theology of the early and medieval church. Beginning with Justin the Martyr (100–165 AD), and including Gregory of Nyssa (335–394 AD), St. Augustine (354–430 AD), and St. Thomas Aquinas (1225–1274 AD), Christian scholars saw the glory of God revealed in beauty. Aquinas described beauty as a unified whole, which consisted of integrity, proportion, and clarity. Like the Greek philosophical tradition, beauty communicated knowledge of the good and the true.³⁸

The combined insights of the ancient Greeks and early and medieval Christians about the important role of beauty in understanding the true and the good faded during the Protestant Reformation and into the contemporary era. Science, the Reformation, and subsequently the Enlightenment shifted the West from a transcendental worldview to a material worldview.³⁹ Gesa Thiessen explains how the fundamental changes during this period impacted theological aesthetics.⁴⁰ Protestants generally distrusted mediation and placed new emphasis on the individual clinging to God alone. This attitude developed differently in various denominations.

Luther countenanced images but warned against trusting beauty. Trust is reserved for God.⁴¹ Luther emphasized that of God “we can have absolutely no image or vision.”⁴²

³⁷ Aristotle, *Metaphysics*, in *The Basic Works of Aristotle*, (ed.) Richard McKeon (New York: Penguin Random House, 2008), 1078 a36.

³⁸ Bruno Forte, *Portal of Beauty* (Grand Rapids: Eerdmans, 2008), 17.

³⁹ Montague Brown, *Restoration of Reason: The Eclipse and Recovery of Truth, Goodness, and Beauty* (Grand Rapids, MI: Baker Academic, 2006), 48.

⁴⁰ Gesa Thiessen, *Theological Aesthetics: A Reader* (Grand Rapids: Eerdmans, 2004).

⁴¹ *Ibid.*, 126. See also Steven Ozment, *The Serpent and the Lamb: Cranach, Luther and the Making of the Reformation* (New Haven: Yale University Press, 2012).

⁴² Thiessen, *Theological Aesthetics*, 127 (quoting John Calvin’s 1539 *The Institutes of the Christian Religion*).

Calvin, more skeptical of images than Luther, rejected “any presence of images in churches, ‘for God himself is the sole and proper witness of himself.’”⁴³ Rejecting the visual, however, destabilizes ancient and medieval unity of the triune transcendental we have been discussing: the good, the true, and the beautiful. The insight of beauty becomes largely lost to Western philosophy and law.⁴⁴

A second important part of this story is the rise of modern science. Francis Bacon is a key figure marking the shift from faith to testing and observation. Montague Brown argues that Bacon, in limiting knowledge solely to what can be physically measured, “restricts the legitimate activity of reason to mathematics and physics, thereby denying the realm of . . . traditional metaphysics.”⁴⁵ As a result, reason and human experience are limited to the material world. John Dadosky notes that differentiation is a key element of the scientific revolution, which means that “[t]he true becomes differentiated from the good, and likewise, the beautiful becomes an autonomous field of knowledge— aesthetics.”⁴⁶ Yet, when beauty is separated from goodness and truth, becoming its own field of knowledge, it ceases to be objective. As Dadosky explains, “the beautiful will not be able to survive in a context conditioned by historicism, materialism, and psychoanalysis. In other words, beauty becomes simply in the eye of the beholder. The immanence of the sciences replaces the possibility of the immanence of the beautiful.”⁴⁷ Legalistic moralism replaces beauty as communicating the true and the good. Ethics is separated from beauty, and beauty becomes superficial—consigned to the realm of “appearance” and personal taste.⁴⁸

Balthasar argues that Catholicism has not been immune to this disconnect. He writes, “Theological ethics is losing its all too philosophical character and is now understood to be the historical encounter with the Word of God in an ever-changing historical situation.”⁴⁹ A scientific focus on verification of the historicity of the “sources of revelation”⁵⁰ takes precedence, and the aesthetic dimension is lost. For Balthasar, one of the deepest losses is understanding the sheer attractiveness of Christ and the desire to do the good inspired by that beauty. The division of beauty, truth, and goodness severs the connection between beauty and action.

Balthasar also traces this tradition of skepticism toward beauty to the Reformation but attributes the separation of aesthetics from other spheres of life—including theology—to Søren Kierkegaard, rather than earlier Protestant theologians.⁵¹

⁴³ Hans Urs Von Balthasar, *Seeing the Form*, vol. 1 of *The Glory of the Lord: A Theological Aesthetics*, trans. Erasmo Leiva-Merikakis (San Francisco: Ignatius Press, [1982] 1989), 57.

⁴⁴ Lutheran and Anglican churches often retained visual art, while Calvinists and Methodists tended toward text and music in order to place a greater significance on hearing the Word of God. Theissen, *Theological Aesthetics*, 126.

⁴⁵ Brown, *Restoration of Reason*, 25.

⁴⁶ John Dadosky, “Recovering Beauty in the Subject: Balthasar and Lonergan Confront Kierkegaard,” *American Catholic Philosophical Quarterly* 83 (2009): 520.

⁴⁷ *Ibid.*, 520.

⁴⁸ Eric Ziolkowski argues that the autonomy of art later “culminates with the notion of l’art pour l’art in the nineteenth century” in “Kierkegaard’s Concept of the Aesthetic: A Semantic Leap from Baumgarten,” *Literature and Theology* 6 (1992): 35.

⁴⁹ Balthasar, *The Glory of the Lord: A Theological Aesthetics*, 75.

⁵⁰ *Ibid.*, 74.

⁵¹ Ziolkowski, “Kierkegaard’s Concept of the Aesthetic,” 34.

Ultimately, Kierkegaard sets the aesthetic and religious on opposite sides of a spectrum, placing the ethical in between.⁵² Dadosky argues: “If we consider that Kierkegaard was influenced by Luther in the way Balthasar describes (‘Luther’s attack on the “whore” Reason, which aesthetically attempts to achieve a harmony between divinity and humanity’) then for Kierkegaard the beauty of this world can offer no image of the beauty of God.”⁵³ Even if we acknowledge that some element of the aesthetic could be redeemed in Kierkegaard, it seems clear that the aesthetic does not reveal God in any positive way. Kierkegaard follows Alexander Baumgarten, who separated philosophical understandings of art from religion.⁵⁴ Balthasar notes that there were also “early moves in this direction by Schiller, Schelling, Goethe, and the early German and classical English Romantics.”⁵⁵ Aiden Nichols argues that “the descendants of Kierkegaard treat the Christian reality as entirely inward ... they finish with Bultmann, for whom revelation has neither imagery nor form.”⁵⁶

In the introduction to *The Glory of the Lord: Volume 1*, Balthasar diagnoses the contemporary cultural malaise as a rejection of beauty. He writes that today “we no longer dare to believe in beauty and we make of it a mere appearance in order the more easily to dispose of it.”⁵⁷ Our society suffers the repercussions of this. In abandoning beauty, “the good also loses its attractiveness, the self-evidence of why it must be carried out.”⁵⁸ Balthasar comments that in previous ages, the *καλοκάγαθός*—the beautiful and the true—seemed self-evident.⁵⁹ At the heart of Balthasar’s work is a desire to “overcome the ‘aesthetic autonomy’ of contemporary academic aesthetics and recover the original unity of the beautiful, the true and the good.”⁶⁰ His efforts and those of others have borne fruit as witnessed in the contemporary emergence of aesthetic theology that attracts Protestants along with Catholics, the Orthodox, and non-Christian faiths.

Theological aesthetics is also leading to new thinking about the environment. Wendell Berry laments how modern American Christianity has cooperated with an economic system that destroys the natural beauty of the world, often under the guise of progress and development.⁶¹ The result is a world controlled by “quick profit” and the convenience of the “ready-made,” which has led to the breakdown of both our kinship with each other and the natural world.⁶² When beauty and art find their proper place,

⁵² *Ibid.*, 35.

⁵³ Dadosky, “Recovering Beauty in the Subject,” 519.

⁵⁴ Ziolkowski, “Kierkegaard’s Concept of the Aesthetic,” 36.

⁵⁵ Balthasar, *The Glory of the Lord: A Theological Aesthetics*, 50.

⁵⁶ Aiden Nichols, *The Word Has Been Abroad: A Guide through Balthasar’s Aesthetics* (Washington, DC: The Catholic University of America Press, 1998), 9.

⁵⁷ Balthasar, *The Glory of the Lord: A Theological Aesthetics*, 18.

⁵⁸ *Ibid.*, 19.

⁵⁹ Balthasar, *The Glory of the Lord: A Theological Aesthetics*, 25.

⁶⁰ Oleg Bychkov, “Introduction,” in *Theological Aesthetics after von Balthasar*, (eds.) James Fordor and Oleg Bychkov (New York: Routledge 2008), xiv.

⁶¹ Wendell Berry, *The Art of the Commonplace: The Agrarian Essays*, (ed.) Norman Wirzba (Washington, DC: Counterpoint Press, 2003), 319.

⁶² Wendell Berry, “Manifesto: The Mad Farmer Liberation Front” (1973). Online: http://www.best-poems.net/wendell_berry/manifesto_the_mad_farmer_liberation_front.html (accessed July 12, 2017).

the community “lives, works, remembers, worships, and enjoys itself” together.⁶³ It is the opposite of self-absorbed alienation.

In *Laudato Si'*, Pope Francis uses beauty to critique the current economic system and its implications for the environment. He appeals to beauty in his call for us to love and care for our “common home” and to forge a new understanding of economy. The encyclical references beauty twenty-six times to explain that the contemplation of beauty helps us overcome the dangerous cult of reductionism that characterizes much of political and economic life.⁶⁴ Beauty moves us beyond self-interest toward a deeper sense of responsibility and care for the other.

In this regard, “The relationship between a good aesthetic education and the maintenance of a healthy environment cannot be overlooked.”⁶⁵ By learning to see and appreciate beauty, we learn to reject self-interested pragmatism. Learning to stop and admire the beautiful teaches us to stop searching for advantage and using others without scruple. If we want to bring about deep change, we need to realize that mindset influences behavior. Efforts at education will be inadequate unless we strive to promote a new way of thinking about human beings, life, society, and our relationship with nature. Otherwise, the paradigm of consumerism will continue to advance, with the help of the media and the highly effective workings of the market.⁶⁶

Beauty and international environmental law

The recovery of beauty in theology is a hopeful sign for international law⁶⁷. Modern international law emerged to replace religion in governing relations among states in 1648 as the last major war between Protestants and Catholics, the Thirty Years War, came to an end in Europe. International law was the invention of Protestants to substitute for the role filled by the Papacy and Holy Roman Empire.⁶⁸ The field has rested on tradition since its founding. It is in need of renewal through new means of providing pathways to truth and to the confidence and pleasure of acting for the good.

The recovery of beauty in academic disciplines and education in beauty should result in the transformation we need to replace pure self-interest with space for common interest. The reintroduction of aesthetic theory to law holds real promise for expanding the possibilities of what law can accomplish for the environment. Pope Francis discusses the role of law, especially international law, in the protection of the environment in *Laudato Si'*.⁶⁹ His references to the importance of beauty as inspiration

⁶³ Berry, *The Art of the Commonplace*, 317.

⁶⁴ Pope Francis, *Laudato Si'*, §112.

⁶⁵ *Ibid.*, §115.

⁶⁶ *Ibid.*, §215.

⁶⁷ This section draws on Mary Ellen O'Connell, “Law, Theology, and Aesthetics, Identifying the Sources of Authority,” in *Theology as Interdisciplinary Inquiry: Learning with and from the Natural and Human Sciences*, (eds.) R.W. Lovin and J. Mauldin (Grand Rapids: Eerdmans, 2017), 121.

⁶⁸ Hugo Grotius, “Prolegomena,” in *Law of War and Peace*, trans. Francis Kelsey (Oxford: Clarendon Press, [1625] 1925). Grotius was a Protestant theologian, jurist, and diplomat.

⁶⁹ Pope Francis, *Laudato Si'*, §5.

to care for the planet extends to the law designed for that very purpose. Through beauty, we can ground a legal theory that calls for action on behalf of others and the natural world.

Commenting on why beauty became lost to legal theory, Costas Douzinas explains that the connection between beauty and law was once well known and continues to be represented in the attractive, blindfolded statues of justice, holding a sword in one hand and a balance in the other. The need for the sword was not rejected but was given equal place with the balance—a symbol of fairness, another word for beauty. The “inner relationship between the beautiful and the good” was once well understood, and “the link between law, order, and harmony, or between justice and beauty form[ed] a consistent theme in the writings of the humanist lawyers both in England and continental Europe.”⁷⁰ Aesthetics once played a key role in forming legal thought and can do so again.

In developing the law we need, and articulating the reasons to comply with it, beauty teaches that human beings are capable of selflessness. Law need not rely on simple economic incentives respecting wealth. Building on Plato, Aquinas, and Kant, twentieth-century secular philosophers Iris Murdoch and Hannah Arendt reach conclusions that parallel those of aesthetic theologians. Murdoch and Arendt have shown through aesthetic theory selflessness is as inherent to humanity as self-interest. Our capacity for selflessness is a counterpoint to the interest in self, providing an argument for law compliance even in the absence of personal advantage or coercion. Murdoch shows further that the unselfish life is the good life. Linking selflessness to the good supports the conclusion that law for the common good is possible and can be effective.

Murdoch applies practical reason to conclude that human beings are naturally selfish—a perspective she shares with many economists.⁷¹ She then builds moral philosophy around antidotes for selfishness. The most obvious “occasion for ‘unselfing’” that she finds is beauty: “Plato pointed out, beauty is the only spiritual thing which we love by instinct.”⁷² Murdoch offers a gloss on Kant’s experience of disinterested pleasure in contemplation of the beautiful, finding the experience may be produced through contemplation of good art as well as nature. The surer object for the experience of unselfish pleasure, however, is nature: “[W]e take a self-forgetful pleasure in the sheer alien pointless independent existence of animals, birds, stones and trees. ‘Not how the world is, but that it is, is the mystical.’”⁷³

The good life is the unselfish life. This is known through the unselfish pleasure experienced in the contemplation of beauty. “The self, the place where we live, is a place of illusion. Goodness relates to the attempt to see the unself, to see and to respond to the real world in the light of a virtuous consciousness.”⁷⁴ In a concordant way, the literary theorist Elaine Scarry also sees how beauty leads us to understand

⁷⁰ Costas Douzinas, “Prosopon and Antiprosopon: Prolegomena for a Legal Iconology,” in *Law and the Image: The Authority of Art and the Aesthetics of Law*, (eds.) C. Douzinas and Nead (Chicago: University of Chicago Press, 1999), 36, 53.

⁷¹ Iris Murdoch, *The Sovereignty of Good* (Abingdon: Oxon, Routledge & Kegan Paul, 1970), 78.

⁷² *Ibid.*, 84.

⁷³ Murdoch, *The Sovereignty of Good*, 85.

⁷⁴ *Ibid.*, 93.

why we should live with one another in peace through recognizing the equality of others. Scarry also draws on Plato, as well as Dante and Simone Weil, to explain how the contemplation of one beautiful thing leads us to the general and the universal. Care for something beautiful opens us to care and concern for the world.⁷⁵ Empathy is engendered by being drawn outside of ourselves to the world by its beauty, as understood through a single beautiful thing.

Scarry links this concern beyond self directly to law, in particular to the fundamental and interrelated legal principles of justice, equality, and fairness. She argues that the pervasive understanding of the value of treating people equally before the law is supported by our instinctual interest in or empathy for the other. The proof of the importance of fairness, equality, and justice as integral aims of law is found in our reaction to beauty. Scarry sees even more direct linkages between beauty and the reasons for law. She reminds us that “beauty” and “fairness” are terms once used interchangeably. Equality, proportion, and symmetry are at the heart of what we understand as beauty. Aquinas’s clarity, integrity, and proportion are found in the rose in first bloom—an ancient symbol of beauty.

Beauty does more than provide the rationale for law and its core principles. As Pope Francis explains in *Laudato Si'*, beauty inspires action toward justice.⁷⁶ Scarry sees “that beauty’s emphasis on symmetry, communicability, and shared emotion provides a model for ideal social relations, relations described in terms of justice or mutuality.”⁷⁷ Inspiration to achieve justice is found in our shared experience and sense of commonality. The international law scholar Philip Allott also finds inspiration to act in contemplation of the ideal, which can also be termed “excellence”⁷⁸ or “the beautiful”: “[T]he mind contains a particular kind of idea—the ideal—a powerful form of mental energy that leads us to make a *better* reality caused by the magnetic attraction of ideas such as justice, the good, the true, the beautiful, the ideal.”⁷⁹ Action inspired by beauty is toward the beautiful. As we learn to care for something beautiful on a personal level, it opens us to care for our wider community. As a result, beauty can help us foster the virtue of empathy.

Aesthetic theory provides secular reasons for respecting legal authority that are in harmony with the world’s religions, as well as schools of philosophy, the humanities, science, and even economics.⁸⁰ Aesthetic insight reveals the human capacity to experience a purely unselfish pleasure in the contemplation of beauty. The fact of unselfish pleasure demonstrates the capacity of people to truly care about others and the natural world even when there is little or no personal gain involved.⁸¹ We

⁷⁵ Elaine Scarry, *On Beauty and Being Just* (Princeton: Princeton University Press, 1999), 82.

⁷⁶ *Ibid.*, 115.

⁷⁷ Mark Canuel, *Justice, Dissent, and the Sublime* (Baltimore: Johns Hopkins University Press, 2012), 5.

⁷⁸ Gordon Graham, “Aesthetics as a Normative Science,” *Royal Institute of Philosophy Supplement* 75 (2014): 214.

⁷⁹ Philip Allott, “The Idealist’s Dilemma: Re-Imagining International Society” (May 23, 2014). Online: <http://www.ejiltalk.org/the-idealists-dilemma-re-imagining-international-society/> (accessed July 12, 2017).

⁸⁰ For a wide-ranging discussion of beauty in a variety of disciplines, see Vittorio Hösle, (ed.) *The Many Faces of Beauty* (Notre Dame, IN: Notre Dame University Press, 2013).

⁸¹ See Philip Allott, “Europe and the Idea of the Transcendental, Human Rights and Other Imagined Entities,” paper presented at *The Crisis of Eurocentrism and the Future of the European Humanism: Historical, Cultural, Religious, Legal and Socio-Economic Perspectives*, Università Cattolica del Sacro Cuore, Milan (April 16, 2016).

can be persuaded to sacrifice fossil fuels or waste production knowing that others will benefit—other humans and other participants in creation.

Conclusion

Theology is being renewed “in the light of and perceived through sense knowledge (sensation, feeling, imagination), through beauty, and the arts.”⁸² Aesthetics is leading to a renewed understanding of the morally good life.⁸³ This understanding is essential to law that is guiding conduct toward the good. The aesthetic of beauty tells us that such law aims to achieve peace, harmony, fairness, and justice. These desiderata have value and are worthy of some sacrifice of personal and national self-interest to gain them for others and the natural world. The aesthetic theory of beauty provides reasons for participation and compliance with law designed to support flourishing everywhere.

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⁸² Thiessen, *Theological Aesthetic*, 1.

⁸³ Graham, “Aesthetics as a Normative Science,” 94. See also Cyril O’Regan, “Theology, Art and Beauty,” in *The Many Faces of Beauty*, (ed.) Vittorio Hösle (Notre Dame, IN: Notre Dame University Press, 2013).

In Defense of Biodiversity: Biodiversity in Ecology and Theology

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Introduction

Pope Francis's encyclical letter *Laudato Si'* is the latest in a line of statements of Christian environmental responsibility.¹ Study and reflection by the churches, as well as concrete action, is evidence of increasing awareness of the environmental imperative.²

However, the moral and practical project is in danger of lacking the distinctive character of Christian witness in the absence of a critical theological engagement with ecology. This enterprise is particularly urgent in the contemporary cultural context in which ecological science speaks with a virtually unquestioned authority in defining and interpreting biodiversity. This can lead theology to an attitude of accommodationism: ecology establishes what biodiversity is and what we should do about it, and then theologians nod their heads and try to find theological reasons for doing so. Here theology is a sort of icing on the scientific cake, extraneous to ecology itself. But Christian engagement with ecological knowledges needs to express theology's own self-understanding as the "science," the true knowledge, of everything there is. Without that critical enterprise, the churches risk forfeiting their prophetic vocation to read secular knowledges and discourses according to the logic of the gospel.

In the first part of this chapter, I suggest that we cannot talk about biodiversity at all without presupposing some picture of reality as a whole: the ecological concept of biodiversity begs theological narration. The second part considers Thomas Aquinas's well-known account of the good which is created diversity to show Christian theology as an ecology in itself: it frames a conception of what nature is, which is rooted in an account of difference and its goodness. The proposal underlying both aspects of the

¹ Pope Francis, *Laudato Si': On Care for Our Common Home* (London: Catholic Truth Society, 2015). See also Ecumenical Patriarch Bartholomew, *Toward an Ecology of Transfiguration: Orthodox Christian Perspectives on Environment, Nature and Creation*, (eds.) John Chryssavgis and Bruce Foltz (New York: Fordham University Press, 2013); Leonardo Boff, *Toward an Eco-Spirituality* (London: Crossroad, 2015); and Celia Deane-Drummond, "Joining in the Dance: Ecology in Roman Catholic Social Teaching," *New Blackfriars* 93 (2012): 193–212.

² Bill Huebsch and Trish Hindmarsh, *Care for Our Common Home: An Australian Group Reading Guide to Pope Francis' Laudato Si'* (Victoria, Australia: Garratt Publishing, 2015) is an outstanding example of ecclesial reflection and a move toward changed practice.

discussion is that theology is not “outside” ecology looking in. The kind of essentialism that dominates the public perception of science and religion misses the inextricable entanglement of the two, the impossibility of drawing definite boundaries between them, which characterizes their development.³ A theological approach to ecology is not a value-added exercise for those who have the taste for it but is a way of making explicit the theology already operative in ecological thinking. This is not a land grab, where ecological territory is appropriated for theologians to occupy; rather, theology calls on a broader picture of what reality is like in which ecological intuitions can be distinguished as inescapably metaphysical and negotiated more constructively as such. In this way, questions about the nature and place of human beings in the biological world, the scope of diversity, the nature of biological change and loss, and the rationale for biodiversity conservation can all be illuminated.

This kind of project may seem like an idle luxury in the face of the crisis of biodiversity loss. But it is not idle, in at least two ways. First, for Christian communities, it is a crucial way of taking ownership of ecological insight and understanding, assuming an answerability to it, and recognizing that faith’s domain is *everything* in light of God. Second, it is a way of helping ecology itself—a science now so decisive for our collective well-being and even survival—become more mature, comprehensive, and grounded.

“Biodiversity” is implicitly theological

Ecology is not “just” a science anymore. It is part of public, political, and even spiritual discourse. The concept of biodiversity is one of the clearer examples of this pervasiveness. It has become fundamental to our collective language for valuing nature,⁴ expressing a sense of a plenitude or fullness in nature that we seek to celebrate and protect.⁵ David Takacs sees the modern use of the concept as inherently personal and axiological:

Each of us can find in it what we cherish ... What is it you most prize in the natural world? Yes, biodiversity is that, too. In biodiversity each of us finds a mirror for our most treasured natural images, our most fervent environmental concerns.⁶

The ongoing debates around the meaning and definition of biodiversity reflect its character as a vessel for social concern. It appears as a fundamentally pragmatic notion, used to bring about change, and in this sense is not a simple descriptive or empirical term. From its inception, the concept of “biodiversity” has been oriented to

³ Seminally, John Hedley Brooke and Geoffrey Cantor, *Reconstructing Nature: The Engagement of Science and Religion* (London: T&T Clark, 1998), and John Hedley Brooke, *Science and Religion: Some Historical Perspectives* (Cambridge: Cambridge University Press, 2014).

⁴ The sociology of this change is a field in itself; see Bronislaw Szerszynski’s perceptive *Nature, Technology and the Sacred* (Oxford: Wiley-Blackwell, 2005).

⁵ Markku Oksanen, “Biodiversity Considered Philosophically: An Introduction,” in *Philosophy and Biodiversity*, (eds.) Markku Oksanen and Juhani Pietarinen (Cambridge: Cambridge University Press, 2009), 4.

⁶ David Takacs, *The Idea of Biodiversity: Philosophies of Paradise* (Baltimore and London: Johns Hopkins University Press, 1996), 81.

certain ends and expressive of a picture of what is good about the world, what deserves our attention and commitment. In his well-known survey of biodiversity, Don DeLong writes:

By coining the new concept, the conservation biologists had a mission in mind: to promote the cause of conservation and to alarm the decision makers about the biological diversity “crisis” ... Thus, biodiversity, the neologism, is a value-laden notion that manifests both the sense of wonder before diversity and the worry over its loss. It was the rapid, mainly anthropogenic, decline of biological diversity that induced the U.S. scientists to invent the catchword and to launch a campaign.⁷

On one count, “biodiversity” has generated over eighty-five definitions, drawing many different disciplines into the discussion in the process.⁸ This vagueness appears to be central to its social and political success, as well as its scientific fertility, promoting conversation and cooperation between different fields and disciplines.⁹ Raising questions that escape containment in any one disciplinary approach, the concept has drawn criticism for lacking explanatory power, with some suggesting that it does not do much more for us than previous concepts that functioned in a similar way.¹⁰ This underlines how socially and politically laden the term is: it is being used not so much because it is the most precise analytic term available, but because it expresses what we need to say about nature now, at this time, or it expresses that we do not quite know what we need to say, except that the richness of life on Earth calls for the most expansive affirmation we can collectively muster.

The fractured usage of a word so pivotal for ecology points to the contestability of the concept of nature itself.¹¹ Implicit in “biodiversity,” as in all scientific concepts, is a notion of what counts as relevant and significant. Kevin Gaston and John Spicer advert to this general feature of science when they recognize that the very act of selecting “biodiversity” as worthy of study expresses a value judgment: “Both what you are measuring and how you are measuring it reveals something about what you most value.”¹²

The disagreements the concept of biodiversity has generated expose the boundaries between different ways of valuing nature and life, as well as the complex relations between scientific, societal, and philosophical approaches to the natural world. By crystallizing what is most deeply at stake in the concept, the disagreements reveal the “theologies” already operative in ecological thought. Some definitions of

⁷ Oksanen, “Biodiversity Considered Philosophically,” 4.

⁸ Don DeLong, “Defining Biodiversity,” *Wildlife Society Bulletin* 24 (1996): 738–49.

⁹ Takacs, *The Idea of Biodiversity*, 81.

¹⁰ Julia Koricheva and Elena Siipi, “The Phenomenon of Biodiversity,” in *Philosophy and Biodiversity*, (eds.) Markku Oksanen and Juhani Pietaren (Cambridge: Cambridge University Press, 2009), 27–53, 48.

¹¹ A study drawing on a wide variety of disciplinary perspectives including the ecological is Michael Soulé and Gary Lease (eds.), *Reinventing Nature: Responses to Postmodern Deconstruction* (Washington, DC: Island Press, 1995).

¹² Kevin Gaston and John Spicer, *Biodiversity: An Introduction* (Oxford: Blackwell, 1998), quoted in Takacs, *The Idea of Biodiversity*, 37.

biodiversity focus on simple species richness, while others include not only number but also variability and variety of species (a beetle and a sparrow constitute a higher biodiversity value than two different species of beetle). Some include different levels of biological hierarchy: ecosystem diversity, for example, or abiotic components, such as landscapes. Some define biodiversity as including ecological processes as well as living organisms, while others hold it must be restrictively applied only to that which is biologically alive. A further debate concerns what is allowed to count as “diverse”: only native diversity—diversity that humans did not put there? Or human-generated diversity as well? Does the biological diversity of the forests of Hawaii count, if all the tree species in the forest were introduced by human beings? It has been argued that we can to a degree circumvent this pluralism by separating the *definition* of biodiversity from the biodiversity *measure* that is adopted. In this way, policy making can proceed without waiting on “theoretical” questions.¹³ But this merely sidesteps the issue, for the empirical purchase of the term is linked directly to what counts for its fulfillment (even if that is only in principle rather than in practice). The “x” that biodiversity names, and the criteria for identifying it, are not separable, even if we recognize that we cannot measure “x” to a degree of precision or comprehensiveness that would match our definitions.

The debate over definitions substantiates the impression that ecology does not operate with values or criteria arising exclusively from nature itself. More revealing still of its orientation to and from the human world are debates over whether and how biodiversity is a good. This may seem banal since one is unlikely to hear an ecologist, or anyone else, saying that biodiversity is bad. But its value is not as obvious as might be supposed. To inhabitants of mangrove forests in Bangladesh, the forms of large vertebrate diversity known as the Bengal tiger and the Nile crocodile may count as biological difference, but it is not obvious that they are good, responsible as they are for the gruesome deaths of hundreds of villagers each year. To inhabitants of the southern hemisphere, the mosquito is hardly a desirable form of biological difference. Forgetting the megafauna that Europeans have exterminated over recent centuries,¹⁴ we have waged efficient war on millions of microorganisms throughout human history, as a result of which we live longer and healthier lives.

Rephrasing “biodiversity” as “biological-difference” sharpens the point. Why is it that the difference of creatures is good? Where does our instinctive sense that *more* variety and not *less* is desirable come from? It seems this is a pre-theoretical orientation. As so often in science, an encounter with a foundational inexplicability in a particular discourse presents a vital opportunity. Takacs reports a conversation with one biologist:

When I’m asked, “should we save this species or that species, or this place or that place?” the answer is always “Yes!” with an exclamation point. Because it’s obvious.

¹³ Koricheva and Siipi, “The Phenomenon of Biodiversity,” gives an accessible overview of the different issues.

¹⁴ Michael Northcott’s discussion of the ideological biocide of “vermin” characterizing the early modern period in Britain is acute. *Place, Ecology and the Sacred: The Moral Geography of Sustainable Communities* (London: Bloomsbury, 2015), 60–1.

And if you ask me to justify it, then I switch into a more cognitive consciousness and can start giving you reasons, economic reasons, aesthetic reasons. They're all dualistic, in a sense. But the feeling that underlies it is that "yes!" And that "yes!" comes out of the affirmation of being part of it all, being part of this whole evolutionary process.¹⁵

The "affirmation of being part of it all" is offered as a rationale for the *Yes* that emerges spontaneously in response to life's richness. But this is to repeat the puzzle, not to explain it, like Edward Wilson's famed notion of "biophilia."¹⁶ The supposition that we are "part of it all" is itself an ecological nostrum and not self-evident, as demonstrated by the widespread existence of alternative philosophies that view the human being as fundamentally an alien in the world.¹⁷ The contestability even of this seemingly self-evident and instinctive alignment is apparent from the fact that ecologists themselves cannot agree whether we are truly "part of it all" as far as biodiversity is concerned or whether humans need to be excluded from biodiversity itself.¹⁸

While ecologists debate why and how biodiversity is a good, the lack of a broader context for the discussion has generated conflict within the discipline.¹⁹ Some propose that biodiversity is good instrumentally: it improves ecosystem stability, or it provides evolutionary flexibility and so is a kind of insurance against change, or it is a resource of immense importance to human beings—valued to the world economy at \$33 trillion.²⁰ Others defend the value of biodiversity independently of its use, whether human or ecological. It is worth something for its own sake.²¹ Instrumentalists face the challenge of instrumentally useless biodiversity or "redundancy." Some of the charismatic megafauna we are most emotionally invested in have low or nil ecological "use-value" since in many cases, they are replaced or replaceable by humans, as in the UK, or they are so few in number that the disappearance of the final populations is unlikely to change ecosystem function.²² Anthropogenic developments could mimic

¹⁵ Takacs, *The Idea of Biodiversity*, 97.

¹⁶ Developed in Edward Wilson and Stephen Kellert (eds.), *The Biophilia Hypothesis* (Washington, DC: Island Press, 1993), helpfully critiqued in Yannick Joye and Andreas De Block, "Nature and I Are Two: A Critical Examination of the Biophilia Hypothesis," *Environmental Values* 20 (2011): 189–215.

¹⁷ The classic study of the human as alien is Hans Jonas, *The Gnostic Religion* (Boston: Beacon Press, 2001).

¹⁸ See J. Callicott, Crowder, and K. Mumford, "Current Normative Concepts in Conservation," *Conservation Biology* 13 (1999): 22–35.

¹⁹ The debate is outlined in Koricheva and Siipi, "The Phenomenon of Biodiversity," 38–40. They note that the distinction in many cases is one of context: ecologists might hold to a noninstrumental value model privately but trade on the instrumental one in public discourse.

²⁰ R. Costanza et al., "The Value of the World's Ecosystem Services and Natural Capital," *Nature* 387.6630 (1997): 253–60.

²¹ Examined in Keekok Lee, "The Source and Locus of Intrinsic Value: A Reexamination," *Environmental Ethics* 18 (1996): 297–309. A representative sample of the different views can be found in Holmes Rolston and Andrew Light (eds.), *Environmental Ethics: An Anthology* (Oxford: Blackwell, 2003), 129–90.

²² The hierarchical structure of ecology begs these sorts of questions directly. At what level should conservation efforts be targeted, and what is the ultimate aim of conservation practice? Koricheva and Siipi identify the key players in this debate; "The Phenomenon of Biodiversity," 44–64.

or even improve on the performance of certain species in ecosystem function. Does the “natural” supplier of that function retain only a sentimental or aesthetic value? If we fall back on the aesthetic value as the foundational one, we have not avoided the underlying issue since we need to ask whether and why this is irreplaceable by humans: why does the beauty of a “natural” object trump the beauty of a human-made one in most people’s instincts? The alternative, defending a noninstrumental “intrinsic” value to biodiversity, faces the puzzle of what it could mean for biological diversity to have “intrinsic” value. Where does “intrinsic value” come from? Is it absolute? The difficulties of this approach are magnified by the operations of nature itself, which cheerfully destroys its own biodiversity regularly; the first five mass-extinction events were brought about by Earth’s own “natural” climatic and geological change. Nature cannot then itself be a norm for intrinsic value.

This invites the further question of whether humans are to be thought of as inside or outside the system, another division in ecological opinion. The debate over evolutionary values makes this question more urgent. How, if nature is our standard for the good of biodiversity, can we express what is wrong with humans behaving in a “natural” evolutionary manner: multiplying at the expense of other species, perfecting competitive techniques of dominance, which put their mastery beyond question? This problem is made more intractable by the well-known problems with a balance-of-nature model. If nature is not “intrinsically” balanced, what is so wrong about changing it?

“Nature” eludes our attempts either to essentialize it or to make of it a moral foundation. In making biodiversity a central concept, contemporary ecology faces questions that appear insoluble in a framework that refuses to comment on, or picture, the whole of reality. Without such a picture, it cannot securely identify abiding and reliable natural goods beyond controversy or articulate the rationale for those goods that are identified. This is a general feature of science in an age of the consistent undermining of formerly secure norms, such as “nature.” It also makes ecology relentlessly political: societal values and priorities intrude upon it everywhere, and what count as ecological goods for one group may not for another.²³ Reintroduction of wolves to the Scottish Highlands is appealing from Bristol but less attractive in Inverness. These instabilities in the concept of biodiversity seem at face value to be straightforwardly empirical. But they are the hallmarks of a conceptual project that calls for a setting or context that is bigger than the canvas of the notion as definable by “science,” if “science” is conceived as a set of pragmatic disciplines that relate only extraneously to notions of value, the good, and the constitution of reality itself. Such instabilities testify to the presence of the metaphysical in even the most apparently uncontroversial accounts of what is in the world.

It is not surprising, then, that in its historical origins, the notion of a diversity of life traded on a cosmological frame of reference, which included an articulation of a metaphysical value in diversity itself. In the *Timaeus*, Plato argued that maximal diversity is a sign of the perfection of the natural world, which expresses the mind of

²³ Analyzed at length in Tim Forsyth, *Critical Political Ecology: The Politics of Environmental Science* (London: Routledge, 2003).

the demiurge who made it. He emphasized the normativity and desirability of self-regulating stability in natural systems, suggesting that diversity actually generates equilibrium: a capacity to return to an original balance after disturbances. Living beings are central in the self-regulating power of nature and so contribute to the goodness and perfection of the world.²⁴ Darwin himself was influenced by inherited ideas of a balance or perfect equilibrium in nature, an ideal level of diversity to which nature spontaneously tends.²⁵ Scientists are often concerned by historical and philosophical presences in concepts that are functioning normatively. But the debates among ecologists about the meaning and correct usage of the concept of biodiversity indicate the importance of attending to these influences. “Theology” is going on at the deepest level within ecology itself, in ecology’s attempt to define what matters and why in the world of life. It turns out to be very difficult to give a definition of biodiversity and its value in the absence of a broader account of what the world is and should be. Indeed, while contemporary thought has largely lost any metaphysical purchase on a cosmological context that could ground a concept of biodiversity, its societal and political cachet constitutes a prominent way in which a classical metaphysics continues to have influence: nature is still thought of and experienced in terms of richness, abundance, and possibility. What is not easily articulable in modern language is a corresponding sense of what reality itself is like that would make sense of our attraction to abundance, our instinct that biological diversity is normative, and our insistent desire to see multiplicity flourish.

Framing a theological ecology

Theologian John Milbank’s discussion of the antinomy of explanation that pervades natural and social sciences illuminates the way in which ecology trades implicitly on pictures of the good and the true that always exceed the bounds of theorizing.²⁶ In Milbank’s analysis, where fundamental concepts are invoked such as “nature” or “society,” a question always hovers, even where it is not acknowledged: is this the thing that does the explaining? Or the thing to be explained? On Milbank’s account, this antinomy is only troubling if the theological constitution of knowledge as such is denied: knowing always trades on, and assumes, implicit accounts of the world that exceed the competence of any circumscribed and self-explanatory discourse. To use Milbank’s own terms, our most elementary concepts cannot be captured in the terms of “pure immanence” alone.

Thomas Aquinas helps us to imagine how ecology’s elementary concepts could be grounded explicitly in a picture of reality as a whole, and from such a picture to give a

²⁴ Juhani Pietarinen, “Plato on Diversity and Stability in Nature,” in *Philosophy and Biodiversity*, (eds.) Markku Oksanen and Juhani Pietarinen (Cambridge: Cambridge University Press, 2009), 85–100.

²⁵ Kim Cuddington and Michael Ruse, “Biodiversity, Darwin and the Fossil Record,” in *Philosophy and Biodiversity*, (eds.) Markku Oksanen and Juhani Pietarinen (Cambridge: Cambridge University Press, 2009), 102.

²⁶ John Milbank, *Theology and Social Theory*, 2nd edn. (Oxford: Wiley-Blackwell, 2006), 51.

robust account of the good which is the diversity of creatures.²⁷ The accent of Thomas's account is on the *gratuity* of created plenitude.²⁸

For Thomas, God creates in order to communicate the divine goodness, to "represent" God's being, and for this communication, no rationale can be given beyond the good itself: communication of itself is what the good does. Because of what God is like, the divine end in creating is better served by more rather than less difference. A multiplicity of creatures more adequately communicates the divine good because God is infinitely rich, infinitely diverse. For Thomas, creaturely differences are complementary in that they compensate for one another's deficiencies as representations of God.²⁹ Willis Jenkins stresses Thomas's rejection of a univocal moral continuum: creatures are not measured against each other as though on a single ladder of importance.³⁰ It is not just difference that is good, but different sorts of difference. The differences themselves do not all belong to the same genus.³¹ At the same time, the widest possible context for these differences best communicates the infinite diversity of God: the whole universe "more perfectly" represents the divine goodness than any one creature by itself.³² Furthermore, creaturely differences are not extrinsically representative, pointing like road signs to the divine superabundance, but participative representations. The creature is an ontological participation in the divine goodness. Each plant and animal

²⁷ Thomas resisted the view, received through Origen, that inequality among creatures is a consequence of the fall. Thomas says: "In a whole the good is the integrity which results from the order and composition of the parts. Hence it is better for a whole than there be disparity among its parts... than that all its parts be equal." Thomas Aquinas, *Summa Contra Gentiles*, trans. James Anderson, 3.94. Online: <http://www.dhspritory.org/thomas/ContraGentiles2.htm#44> (accessed March 31, 2016). Willis Jenkins foregrounds God's pleasure in a creature being what it is, with all its limits: "God desires ravens to call upon God by acting as ravens, not by learning to sing as angels.... God delights in the simple way stones love him." *Ecologies of Grace: Environmental Ethics and Christian Theology* (Oxford: Oxford University Press, 2008), 123–4.

²⁸ For he brought things into being in order that his goodness might be communicated to creatures, and be represented by them; and because his goodness could not be adequately represented by one creature alone, he produced many and diverse creatures, that what was wanting to one in the representation of the divine goodness might be supplied by another. For goodness, which in God is simple and uniform, in creatures is manifold and divided and hence the whole universe together participates in the divine goodness more perfectly, and represents it better than any single creature whatever.

Thomas Aquinas, *Summa Theologica*, trans. Fathers of the English Dominican Province (Lander, WY: The Aquinas Institute, 2012), I.47.1.

²⁹ The source of both the distinction among things and the inequality among them, Thomas says, is the divine wisdom, not the effect of sin: "The diversity of things results from the original intention of the first agent, not from a diversity of merits" (Aquinas, *Summa Contra Gentiles*, 2.44). He goes on: "But the greatest good in things created is the perfection of the universe, consisting in the order of distinct things; for always the perfection of the whole has precedence over the perfection of the individual parts." This is an "ecological" insight in the sense that it prioritizes the interrelation of parts: it is not distinction alone, but the relation between distinctions, that makes for good.

³⁰ Jenkins, *Ecologies of Grace*, 124. Jenkins addresses questions raised by Thomas's use of notions of a hierarchy of creation in "Biodiversity and Salvation: Thomistic Roots for Environmental Ethics," *The Journal of Religion* 83.3 (2003): 401–20.

³¹ Jenkins notes the careful balance of Aristotelian naturalism with a neo-Platonic Augustinian mysticism: creatures' values are referred constantly beyond themselves, to God whose goodness their diversity represents, and yet their specific and concrete embodied diversity is an essential good (*Ecologies of Grace*, 116–17).

³² Diversity is a quality of perfection: "For the universe would not be perfect if only one grade of goodness were found in things" (Aquinas, *Summa Theologica*, I.47, a2, ad.1).

in some sense *is* the divine goodness communicated, simultaneously with being the recipient of the divine goodness communicated. Such a thickly metaphysical account of creaturely diversity generates a subtle and sensitive valorization of biological diversity. Our instinct for the good of diversity is made sense of via a comprehensive account of the convergence of self-communicating good with reality itself.

This can be brought to bear on defining the boundaries of biodiversity as an ecological concept, for ecological processes and abiotic components too can express this richness, inviting further discussion about the distinctive value of *living* creatures in such a scheme. It also raises the question of how such a general account of created difference can support the specific value not just of the difference of natural objects but of what those objects *do*, of ecological process and the embodied lives of organisms and ecosystems unfolding in time, which remains central to ecological concern.

Thomas's account of the desire of creatures for God takes us to this point. He analyzes living creatures as bodies of desire, which cannot be adequately grasped in a closed natural forum. Ravens who call upon God (Ps. 146.9) are expressing their natural desire for the divine goodness.³³ Jenkins reminds us of Thomas's ontology as the crucial context for this claim: creation is nothing but a relation to God.³⁴ So the integrity of the creature *is* its relationship with God, a relationship of desirous movement toward the divine. Each creature enacts its orientation to the divine goodness in a distinct way. A diversity of natural forms is therefore a diversity of creaturely desires for the divine; each creature desires the good that is God in a manner fitting its own form and telos. "Now to love God above all things is natural to man and to every nature, not only rational but irrational, and even to inanimate nature according to the manner of love which can belong to each creature," and Thomas quotes Dionysius, "God leads everything to love of Godself."³⁵ It is not simply the fact that ravens exist that is significant, but the way ravens express in their embodied lives the desire that they are, and in their activities express their movement of return toward God. In Jenkins's words,

God moves creatures toward God through each creature's natural operations. Creatures participate in God in the dignity of their own causality. Seeking their own proximate goods, creatures desirously move toward divine goodness according to the manner of their respective natures.³⁶

Thomas is not offering a static conception of diversity but a dynamic one that attends to the quotidian doings of plants and animals. A sapling pushing its roots through the

³³ *Ibid.*, II-II.83.10, ad 3: "The young ravens are said to call upon God, on account of the natural desire whereby all things, each in its own way, desire to attain the Divine goodness."

³⁴ Jenkins, *Ecologies of Grace*, 119.

³⁵ Aquinas, *Summa Theologica*, I-II.109.3. Thomas explains that each creature loves the good of the whole more than its own individual good. Scott Hefelfinger explores its significance for different ecologies in "Human, Social and Natural Ecology: Three Ecologies, One Cosmology, and the Common Good," in *Environmental Justice and Climate Change: Assessing Pope Benedict XVI's Ecological Vision for the Church in the United States*, (eds.) Jame Schaefer and Tobias Winright (Maryland: Lexington, 2013), 61–82.

³⁶ Jenkins, *Ecologies of Grace*, 120. Jill LeBlanc pursues a broadly similar account of a Thomistic environmental ethic in "EcoThomism," *Environmental Ethics* 21.3 (1999): 293–306.

soil, a mushroom lifting its head through leaf mold, a hen taking a dust bath; all are expressing a desire for the divine goodness. The same can apply to the action of a river or the falling of snow. This is not biodiversity as a numerical count of different types of things. The richness of what creatures do, as well as their existence as diverse entities, communicates the divine good.

Thomas shows how theology generates an ecological project of its own, indicating the way to a theological ecology. A theological ecology identifies biodiversity not as an inert fact, a self-explanatory “given,” but as a question that demands the largest possible canvas. Against this canvas, it can be narrated as a real and abiding good in itself. Allowing biodiversity to be framed in this way generates a rich language of esteem for the being and doing of creatures. Jenkins underlines Thomas’s loyalty to the *modus loquendi* of Scripture.³⁷ Ravens and lions call for their food from God, mountains leap, rivers clap their hands. Far from effacing the seemingly anthropomorphic language of Scripture in favor of a “realistic” or “scientific” account, theology invites a regard for a distinctive moral or spiritual agency, an inexpugnable orientation to God, in each creature. This theological mode of speech can be brought to bear on ecological discourses that do not explicitly make use of a theological narrative, but whose enquiries into creatures call for such a reading.

A theological ecology would impact on ecological theorizing and practice in a number of ways. It frees ecologists from the need to find instrumental use-values for every element of biodiversity in order to justify its preservation. This makes ecologists unnecessary hostages to fortune. There is no need to deny an instrumental or use-value model in relation to biodiversity, but it can be liberated from functions beyond its capacity if it is acknowledged that there is no need to limit our language about nature in this way. It frees ecologists from the gap between personal motivation and societal, political, or scientific justification that they confessedly suffer from.³⁸ And it offers a way of affirming both entity and process, species and ecosystem richness, biotic and abiotic, “human” and “natural,” which is yet sensitive enough to discern the values of distinctive kinds of difference, such as living versus nonliving. It enables a norm for the goodness of biodiversity, which is not simply *nature* considered as our present and limited experience of what is the case. The transtemporal character of the metaphysical framework reconciles us to the actual operations of biological change, which include both specific and mass extinctions. The fact that a species has become extinct does not mean that, in the perspective of eternity, it did not testify to and mediate the divine goodness. The eons when this planet was inhabited by giant reptiles, for example, are not in any sense “wasted” but are part of the communication of the divine perfection *sub specie aeternitatis*. Such a model can include a diversity of creatures on other planets.

Biodiversity in a theological ecology is not anthropocentric. What counts is *God’s* communication of God’s goodness across time and space. It calls us to recognize the value of the human difference, while not allowing societal, political, and scientific agendas to determine the value of nonhuman life. The difference that humans bring

³⁷ Jenkins, *Ecologies of Grace*, 119.

³⁸ Takacs reports the dualism from which practicing ecologists suffer: “Human economic and health needs were the most frequently expressed reasons why society should care, but they ranked far down the list of reasons why the biologists themselves cared” (*The Idea of Biodiversity*, 280).

to the biosphere counts as part of the representation of the divine goodness but remains within a framework that acts as a brake on the destruction of native biological diversity, insofar as it constitutes a reduction in the richness of the representation of divine goodness.³⁹ It does not short-circuit difficult practical questions about how to distinguish good from bad human influence on life on Earth but generates some metaphysical and moral purchase for pragmatic discernment.

It is crucial to distinguish this kind of approach from a naive apologetics in which such a view of reality is “logically” implied by ecology, as though it were an inescapable conclusion for any rational person. What is being proposed is a view of biological diversity as a participation in an immeasurable plenitude, which always exceeds what is presently knowable and visible.⁴⁰ The metaphysical richness of the classical affirmation of diversity is not recouped as a facile “natural theology,” with theologians taking scientific data and using it to prove their conclusions. That project perpetuates an extrinsic conception of the relation between science and theology. Rather it is suggested that biodiversity expresses and manifests an uncontainable plurality and richness in reality itself. This would be a way of approaching the ecological concept of “biodiversity” as always already theological because it begs questions about what the world is actually like—questions that do not call for “an” answer but that beg a broader context for an enquiry into biodiversity’s meaning, scope, and value. Herbert McCabe expresses it well in his classic articulation of a doctrine of creation as an invitation to an infinite knowability in reality itself.⁴¹

A certain hesitation is appropriate in using the word “mystery” too freely to name this context. Although in Christian theology the definition of this term is well secured against misunderstanding, people often react to the implication of mystification when it is used in the context of scientific endeavor, as though an increase in the precision or comprehensiveness of our knowledge is *over against* this cosmic depth, rather than directly proportionate to it. Notions of “awe” and “wonder” are more evocative of the infinitely knowable to those outside an explicit religious framework, but theologians need to work hard to avoid these concepts becoming stale, losing that porosity or open-endedness that melts our horizons metaphysically as well as empirically.⁴²

In sum, Thomas offers a way of valuing biodiversity, which helps us to negotiate the lack of purely immanent or empirical grounds for its measurement and definition, and honors the actual usage of the concept that reflects a common instinct for the

³⁹ Jenkins explains species loss as a “liturgical impoverishment” (Oksanen, “Biodiversity Considered Philosophically,” 411–14).

⁴⁰ Rowan Williams takes this kind of approach in seeking to articulate a “natural theology” of language in his Gifford lectures: something about the way language functions invites a regard of reality as always exceeding what we can command and control. *The Edge of Words: God and the Habits of Language* (London: Bloomsbury, 2014).

⁴¹ Herbert McCabe, *God Matters* (London: Bloomsbury, 1999), Chapter 1.

⁴² Apparent from the widespread invocation of these notions by many leading “New Atheists.” Richard Dawkins, for example, is keen to stress the constitutive role of awe and wonder in science, while remaining reductionist in his fundamental approach (e.g., *The Magic of Reality: How We Know What’s Really True* (London: Transworld Publishers, 2011)). What is needed is an account of awe and wonder that invites a non-reductive regard of the world. In *Eco-Theology* (London: DLT, 2008), Deane-Drummond proposes that wonder is a virtue, critiquing the shallow significance of “wonder” in the work of Edward Wilson (13).

inherent goodness of plenitude in our experience of the natural world. It does not pretend to answer the technical scientific questions but provides a framework in which the questions can gain some kind of axiological grip. It is a way of giving us a widest possible canvas, a most comprehensive setting, for the practice of ecology and the definition and defense of biodiversity. That “setting” is God and the world in God. But the metaphors need to be governed by an appropriate negative: this is a framework that escapes every horizon, a canvas with no discernible edges, a setting of which we can never gain a bird’s-eye view.

Outcomes

A theological ecology narrates biodiversity as inviting our regard to an infinite expansiveness and richness of possibility that somehow names what the world is like. In this way, far from acting as a restriction on ecology, Christian voices can express its unlimited scope and free it from the burden of giving itself boundaries. It states simply that biodiversity names a reality that extends limitlessly beyond our vision so that our looking and learning face no arbitrary point of cessation.

This kind of approach has moral and ethical applications. Positively, we are invited to see biodiversity as exceeding our agendas and our control and so as calling for a religious respect or reverence. This can ground a practice of celebrating biodiversity and protecting it from anthropogenic destruction.⁴³ Furthermore, because this is a mode of describing and valuing biodiversity that does not arise only from nature as we know it, we can name the “fallenness” of nature. Human destruction of biodiversity can be named as greed, lust, and idolatry; and we can describe nature’s own self-destructive powers as participant in a corruption or incompleteness, which characterizes creation’s groaning and travailing as it waits for redemption. Theology’s ecology would thus be distinguished by a breadth of imagination, which has a voice equally for lament and celebration as a response to the natural world. It also articulates the fundamental unity of these two responses: as we learn to see creation as a resplendent participation in the divine glory, we become less able to shut our eyes to the frustrated potentials that mark life on Earth for all creatures, not just human ones. Moral and spiritual realism about nature go hand in hand with irrepressible hope.⁴⁴ A theological ecology is a radical critique, a hard-nosed insistence that nature, like us, awaits judgment. It refuses to take nature at face value, to limit it to what we now see and know.

⁴³ For a discussion of how theological rationales for biodiversity protection might function, see O’Brien, *Ethics*, Chapter 3. Both O’Brien and Jenkins (*Ecologies of Grace*, 125–32) explore the question of human moral formation through the practice of loving and conserving biodiversity. Habit, virtue, and sanctification are theological concepts that can be used to express the *human* good of caring for creation. Scriptural exegesis will also be crucial, as Robert Murray, *Cosmic Covenant: Biblical Themes of Justice, Peace and the Integrity of Creation* (Piscataway, NJ: Tigris, 2007) and Margaret Barker, *Temple Theology: An Introduction* (London: SPCK, 2004) have explored.

⁴⁴ The hope for creation lacks systematic treatments, but Howard Snyder with Joel Scandrett, *Salvation Means Creation Healed: The Ecology of Sin and Grace* (Eugene, OR: Cascade, 2011) is an interesting exception.

This kind of approach makes significant critical advances possible. Eco-spiritualities and eco-theologies are given a stronger critical apparatus in their use of ecological science. In much of this literature, there is some naïveté about ecology as delivering unimpeachable moral and spiritual norms in notions such as interconnectedness, biocracy, biocentrism, and so on.⁴⁵ While these concepts may have a place in Christian reflection, embodying insights and values that can be found within the tradition already, they call for careful scrutiny rather than fast-tracked exaltation as the new hermeneutic center for Christian reflection. This is simply by way of recognition that, as has been argued here, biodiversity is always already a theological notion; what is needed in theology's grappling with biodiversity is a sensitivity to its moral and metaphysical content. It is popular, for example, to discard "traditional" theological anthropologies in favor of an ecocentrism in which biodiversity becomes a regulating concept.⁴⁶ But this is sometimes done without due regard for the way in which the concept of biodiversity already expresses metaphysical notions that are hospitable to "traditional" conceptions of human beings in the world; or may contain implicit cosmologies with an unexpected richness for articulating human responsibility and natural good; or that some elements and/usages of ecology's language may contain undiagnosed ills, problematic suppositions, and aspirations that invisibly undermine what Christians want to say about nature and life. Without a language for valuing the distinctive human perspective on biodiversity, it is hard to justify some of the points of view we want to maintain, and equally, a theological ecology can give a richer account of biodiversity than could be gained by an insistent exclusion of any perspective above and beyond the "scientific."

This discussion has not attempted to undermine ecological concepts of biodiversity. Rather it has proposed that biodiversity invites a *theological* ecology. Biodiversity can then function, unexpectedly perhaps, as an opportunity for a richer account of knowing itself and for a deeper affirmation of what we inchoately sense: that "life" and "diversity" are goods that in some way name reality itself.

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⁴⁵ Anne Primavesi, most recently in *Exploring Earthiness: The Reality and Perception of Being Human Today* (Eugene, OR: Wipf & Stock, 2013); Sallie McFague, *The Body of God: An Ecological Theology* (Minneapolis: Fortress Press, 2006) rely heavily on ecological norms for developing theological positions and models.

⁴⁶ For example, Heather Eaton, "Where Do We Go from Here? Methodology, Next Steps, Social Change," in *Christian Faith and the Earth: Current Paths and Emerging Horizons in Ecotheology*, (eds.) Ernst Conradie, Sigurd Bergmann, Celia Deane-Drummond, and Denis Edwards (London: T&T Clark, 2014), 214: "[W]e need to understand the natural world as a starting point for comprehending spiritual sensibilities." Earth is "not only our context, but our source" (205). Eaton recognizes the profound methodological challenge facing theology in its relationship to ecology: do ecological insights inform theology or the reverse?

Jenkins, Willis. *Ecologies of Grace: Environmental Ethics and Christian Theology*. Oxford: Oxford University Press, 2008.

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Evolution: A Theology of Niche Construction for the Twenty-First Century

Celia Deane-Drummond

Perhaps one of the most exciting ideas to have appeared in secular evolutionary anthropological literature in recent decades is that of niche construction.¹ Evolution could be thought of as the historical perspective on different ecological niches that exist in any one time.² It is therefore critical to understanding where we have come from in an ecological sense and one that deserves far more attention than has been given so far in the theology and ecology literature. This chapter will focus specifically on the role of humans in this process, given that it is our human activities that impact on planet Earth in the most profound sense. Understanding how we come to act the way we do in given environments or niches is therefore highly relevant to thinking through how to approach and tackle environmental issues today. Evolutionary naturalism is insufficiently satisfying and may partly explain why some advocates of a “Good Anthropocene” incorporate niche construction into what I perceive is a secularized eschatology. More explicit theological engagement with our natural history of human becoming will be, I suggest, crucially important in perceiving how to act in an ecologically responsible way in the twenty-first century. This chapter will review current evidence for what has been variously called the extended evolutionary synthesis (EES) in comparison with standard evolutionary theory (SET), which relies on trait-based models of evolution by natural selection and survival of the fittest. The newer model puts far greater emphasis on a dynamic interchange between humans and other creatures in their natural environment. However, it presses further than the thesis of simple entanglement between different species, toward a dynamic directional movement. Human beings, insofar as they are self-aware, can *form* the world in a self-conscious way, while other creatures cannot.

¹ The idea of niche is very familiar to those who have worked in the area of ecology and theology, but niche construction, as the name suggests, implies a much more positive movement of niche *creation* by the living organisms integral to that niche. Human beings, as this chapter will argue, are the most proactive niche constructors on planet Earth.

² Theological engagements with ecology habitually overlook literature on theology and evolution or incorporate it into grander schemes of cosmic evolution.

I will also suggest in this chapter that it is above all the shift in humanity's relationship with the natural world through the use of *technologies* that is at stake. This has critical implications for humanity's relationship with the natural world.³ Pope Francis's *Laudato Si'* makes the following comment:

Men and women have constantly intervened in nature, but for a long time this meant being in tune with and respecting the possibilities offered by the things themselves. It was a matter of receiving what nature itself allowed, as if from its own hand. Now, by contrast, we are the ones to lay our hands on things, attempting to extract everything possible from them while frequently ignoring or forgetting the reality in front of us.⁴

This brings a burden of deep human responsibility for the future of planet Earth. In the Anthropocene era, we have over-formed that world without even being aware of doing so. Evolutionary and social sciences generally resist charting out a well-defined and hoped-for future or *telos* in a way that theological anthropology does not. A theology of niche construction through a revised theological anthropology begins to fill the conceptual gap left behind in the wake of nondirectional secular naturalistic theories of evolution.

Extended evolutionary synthesis theory and its critics

Any development in the sciences is often accompanied by attempts to suppress newer alternatives that appear marginal to the dominant paradigm.⁵ Such is true of the newest evolutionary theory that has started to catch the attention of biologists, namely, the theory of EES. One of its chief proponents is Kevin Laland, a biologist leading a team from St. Andrews University in Scotland. He confronted his American critics from Duke and Harvard Universities, Gregory Wray and Hopi Hoekstra, in a fascinating head-to-head debate published in the prestigious journal *Nature* in 2014.⁶ The story told by Wray and Hoekstra is one that is familiar to those who have worked at the boundary of theology and science, though even this basic conception of Darwinian evolution is often poorly comprehended by nonspecialists. I will begin with their account first in order to highlight the alternative and show lines of continuity and discontinuity.

³ See Celia Deane-Drummond, Sigurd Bergmann, and Bronislaw Szerszynski (eds.), *Technofutures. Nature and the Sacred: Transdisciplinary Perspectives* (Farnham: Ashgate, 2015) for the importance of engaging religious perspectives on technology and the environment.

⁴ Pope Francis, *Laudato Si': On Care for Our Common Home* (2015), §106. Online: http://w2.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si.html (accessed June 18, 2015).

⁵ Thomas Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 2012). As evidence accumulated for the alternative paradigm, only "blind stubbornness" accounts for continued resistance (202). EES is not yet established to this extent, but it does represent the change in paradigm that Kuhn anticipated (111–34).

⁶ Kevin Laland et al., "Does Evolutionary Theory Need a Re-Think? Researchers Are Divided over What Processes Should Be Considered Fundamental," *Comment, Nature* 9.514 (2014): 161–4.

The standard evolutionary paradigm builds on Charles Darwin's theory of evolution by natural selection. Many theologians who are also interested in ecological matters assume that evolutionary biology is about his theory of evolution by natural selection.⁷ These authors are correct: without Darwin, there would be no biological theory and certainly no modern extended synthesis. Yet the details are important if theologians are to take biology as a discipline seriously. Furthermore, ecology does not make sense without reference to evolutionary biology.⁸ The critical point for biologists is, and always will be, contemporary empirical evidence. One of the interesting features of the ongoing raging debate is that the evidence is used in different ways and given different interpretations. This again is not all that unusual. In Darwin's time, natural selection was thought to be too weak a force to account for the variation in forms found: his theory gave it far more prominence, but it was only much later that genetic evidence in the modern synthesis lent further support for his ideas. Natural selection acts like a passive filter, even though biologists admit that it is a "negative" sieve, so individuals who do not have characteristics that fit them for their environment die earlier than others and therefore have fewer progeny.

The modern synthesis, developed by geneticists working in the early mid-twentieth century (1936–1947), identified deoxyribonucleic acid (DNA) as the material basis for heredity across generations. Two central aspects of this thesis were how to explain both adaptation of organisms to their environments and speciation, the appearance of novelty. Wray and Hoekstra believe that the current field of genetics is far from static and is able to absorb newer emphases, including the importance of development and phenotypic plasticity, variations of which have been in the evolutionary mix since the start.⁹ For them, the narrower focus on genes is the one that is the most scientifically valid as it is based on the "most powerfully predictive, broadly applicable and empirically validated component of evolutionary theory."¹⁰ A genetic basis for heredity brings both precision and grounding in mathematical analysis, such as that in population frequencies of variants over time, which—for these authors at least—brings a more solid empirical scientific foundation to work within.

Laland and his supporters disagree with this assessment and argue that it is time for evolutionary theory to shift. They are not suggesting that genetics is unimportant, but what they do press against is giving it unilateral importance. For them, the main drivers of processes of inheritance are just too complex to be narrowed down to a single factor—genes—with other factors added in as supplements to this central theory. As one might expect, pushing against an assumption that has come to dominate a field

⁷ See, for example, Elizabeth Johnson, *Ask the Beasts: Darwin and the God of Love* (London: Bloomsbury/Continuum, 2014); John Haught, *Making Sense of Evolution: Darwin, God and the Drama of Life* (Louisville: Westminster John Knox Press, 2010).

⁸ Biology, unlike theology, does not, or only rarely does, draw on historical figures as sources of evidence. Darwin is an unusual figure in that biologists still cite his work, but that is normally when a wider public audience is intended or in order to highlight how the evidence for a particular position has been accumulating ever since his theories were developed in the mid-nineteenth century.

⁹ Phenotypic plasticity refers to the ability of an organism to change its observable characteristics (phenotype) in response to changes in external environmental conditions, even though the sum total of the genetic constitution (genotype) remains the same.

¹⁰ Laland et al., "Does Evolutionary Theory Need a Re-Think?" 163.

and its catalog of research for over half a century has met with considerable resistance. Laland believes that this newer theory explains empirical evidence better than SET. For Laland, it is not just about other factors being included in the range of evolutionary research but “a struggle for the very soul of the discipline.”¹¹ For him, SET explains variation primarily through random genetic mutations and adaptation to different environments funneled through a process of natural selection. He argues, in the first place, that placing *developmental bias*, that is, development as a means through which organisms are constructed, alongside genetic factors helps to explain observations in a new way. Second, the environment itself will impact on the expression of specific traits through *plasticity*. Third, organisms directly modify their environments through *niche construction*, and fourth, *extra-genetic inheritance* processes transmit more than genes from one generation to the next.

In order to support his thesis, Laland points to evidence from developmental biology where some morphological forms turn up more frequently than others in a way that is nonrandom and not linked with genetic differences.¹² He also cites similarity of body shapes among cichlids in Lake Malawi compared with those in Lake Tanganyika, including some with large fleshy lips, some with protruding foreheads, and some with short, robust lower jaws, even though (genetically) the cichlids in Lake Malawi are more closely related. The theory most commonly used to explain such convergence relies on genetic processes and natural selection, which then leads to similar forms. But Laland comments: “This account requires extraordinary coincidence to explain the multiple parallel forms that evolved independently in each lake.”¹³ He argues that development bias guides gene pathways down specific routes that are opened up by development.¹⁴ The framing of the way such results are explained differs compared with SET. So, in SET, developmental bias imposes “constraints” on evolution by natural selection. For EES, the developmental processes are more active and could be thought of as a “creative element, demarcating which forms and features evolve, and hence accounting for why organisms possess the characteristics that they do.”¹⁵

Plasticity could be considered a specific form of developmental bias, where individuals respond to specific ecological environments by changing their form. Leaf shape can change form when soil chemistry changes. While SET supporters would view this as “fine tuning,” for EES, such changes are fundamental to the evolutionary process itself and actively *generate* traits that are well suited to that environment, eventually becoming stabilized through a change in genetic variation. The sequence here is critical since it allows the two theories to be distinguished: if the trait comes

¹¹ *Ibid.*, 162.

¹² Research on 1,000 different species of centipedes has shown that the number of leg segments is an outcome of developmental processes. W. Arthur, *Biased Embryos and Evolution* (Cambridge: Cambridge University Press, 2004).

¹³ Laland et al., “Does Evolutionary Theory Need a Re-Think?” 162.

¹⁴ Simon Conway Morris also admits an “eerie” quality to his convergence evolutionary theory that includes what looks like constraint along with the apparently “random” walk resulting from the sieve-like process of natural selection during evolution. He resists the idea of “purpose” but comes close to the concept of “design.” Simon Conway Morris, *Life’s Solution: Inevitable Humans in a Lonely Universe* (Cambridge: Cambridge University Press, 2004), i, 13–18.

¹⁵ Laland et al., “Does Evolutionary Theory Need a Re-Think?” 164.

first, then the genes that cement it follow several generations later. How far a species is able to evolve and change—a characteristic known as “evolvability”—will also therefore depend on developmental processes.

Niche construction theory (NCT) as an aspect of EES is of particular ecological importance. NCT, as the name implies, is about the purposeful directional manner in which organisms build their worlds; termites construct and build their homes in a manner that is shaped by past selection and that anticipates further selection. Laland compares this with volcanic eruptions: both represent changes to the external environment, but the one that is positively built is viewed very differently in EES compared with SET. For SET, the environment is the “background” in which genes are selected, whether that environment has been purposefully built or not. Laland argues that the difference is of critical importance since “organisms co-direct their own evolution by systematically changing environments and thereby biasing selection.”¹⁶

Nongenetic inheritance mechanisms might be epigenetic factors that alter genetic expression but not the sequence and can impact on fertility, longevity, and disease resistance. Socially transmitted behaviors among animals, including migratory behavior in fish and nut cracking in primates, are also ways in which specific and repeatable patterns are passed down to the next generation and so count as inheritance mechanisms.¹⁷ Extra-genetic inheritance can be studied using mathematical modeling and, according to Laland, can explain what are otherwise puzzling phenomena.¹⁸

Laland insists that EES is much more than a “protest” movement but is a viable alternative to SET. Its greater emphasis on behavior and the ability of organisms to adapt positively to their worlds in new ways makes it explicitly relevant for ecological understanding. Wray and Hoekstra, however, are correct to suggest that more scientific evidence is needed to support EES. A shift to a holistic and system-based approach is becoming rather more fashionable in Western cultural contexts compared with single factor explanations, and this may, at least in part, account for the receptivity to EES in the twenty-first century compared with the twentieth, when the popularity of positivistic and narrowly defined empirical methods of science still held sway.

Niche construction theory and human evolution

The implications of EES for understanding human evolution are among the most interesting aspects of this theory, especially with respect to ecology. Evolution, in general terms, reminds humanity that we are made of the same physical material as the rest of the universe and share even closer historical relationships with mammals and, more specifically, primates. Uncovering human evolutionary history will not provide a blueprint for ethical action in the manner that evolutionary ethical naturalism supposes, but it does provide some explanatory insight into our deepest

¹⁶ Ibid., 162.

¹⁷ F.J. Odling Smee, K.N. Laland, and M.W. Feldman, *Niche Construction: The Neglected Process in Evolution* (Princeton: Princeton University Press, 2003).

¹⁸ For example, the rapid colonization of North America by the house finch as well as the adaptive potential of invasive plants, even though they have low genetic diversity.

historical origins and at least some indication of why humans have the tendencies that they do. Anthropologists, like many theologians, have tended to work with dominant trait-based natural selection combined with a cost-benefit analysis of human behavior characteristic of SET. NCT provides an alternative portrait of human origins that puts much more emphasis on an entangled approach to cultural and behavioral characteristics that are part of common human experience.¹⁹ Agustín Fuentes argues that a new theoretical model that deliberately engages with the EES and NCT provides a firmer grounding for what many anthropologists are developing in practice.²⁰ The challenge to integrate within anthropology what happens at the individual, group, and community level dynamics is similar in some respects to the challenge faced more broadly within environmental ethics as it navigates difficult decision-making at individual and community levels.

From an anthropological perspective, religion, legal, and familial spheres provide the institutional contexts that are part of the constructive work of human cultures. Extensive technical and ecological construction operates within these institutions in influencing the structure of evolutionary landscapes. According to this view, it is wrong to suppose that the environment of evolutionary adaptedness (EEA) was only significant in the Pleistocene and then ceased.²¹ An integrated evolutionary process views social, cultural, and biological processes as intertwined, thus breaking down the divide between social anthropology and biological anthropology. For evolutionary anthropology in this vein, religious belief becomes part of the set of social factors that form a complex cultural system, a niche. Humans and other coevolving species modify ecologies, and these modified ecologies are inherited by subsequent generations.

For humans, constructing and inheriting ecological contexts is often mediated via material culture (tools, clothes, buildings, towns etc.), and the actions involved in developing and utilizing this material culture are rooted in the beliefs, institutions, histories, and practices of human groups.²²

A good example of the way this works is illustrated through the sickle cell allele in agricultural groups in West Africa.²³ Sickle cell anemia confers resistance to malaria on those who carry the allele. Specific crop-planting practices led to a spread of malaria,

¹⁹ Tim Ingold and Gisli Paalson (eds.), *Biosocial Becomings: Integrating Social and Biological Anthropology* (Cambridge: Cambridge University Press, 2013); Jon Marks, *Tales of the Ex-Apes: How We Think about Human Evolution* (Berkeley: University of California Press, 2015).

²⁰ Agustín Fuentes, "The Extended Evolutionary Synthesis, Ethnography, and the Human Niche: Toward an Integrated Anthropology," *Current Anthropology* 57 (2016): S13–S26.

²¹ EEA is the sum of all the selection pressures faced by an organism's ancestors. Many evolutionary psychologists identify the Pleistocene as the most significant period when human behavior became adapted to its external environment, which accounts for a mismatch between psychological tendencies best suited to small hunter-gatherer societies and the demands on humans today. See J. Tooby and Cosmides, "The Theoretical Foundations of Evolutionary Psychology," in *Integrations*, 2nd edn., vol. 2 of *The Handbook of Evolutionary Psychology*, (ed.) D.M. Buss (Hoboken: John Wiley, 2015), 625–68. This thesis implies that contemporary evolutionary changes in humans have ceased, a view that Fuentes and many other evolutionary anthropologists reject.

²² Fuentes, "The Extended Evolutionary Synthesis," S15.

²³ Michael O'Brien and Kevin Laland, "Genes, Culture and Agriculture: An Example of Human Niche Construction," *Current Anthropology* 52.4 (2012): 434–70.

which then led to greater selection pressure for the sickle cell allele and so to higher incidence of the disease. The treatment of disease was accompanied by the use of pesticides to control malaria, which then impacted on mosquito evolution through selection for pesticide resistance. A similar case could be made for dairy practices. Low lactose levels are associated with intolerance to dairy products, while high lactase levels are beneficial for those on high dairy diets. Extensive dairying in Neolithic groups in Europe and Asia created selection pressure for high lactase levels.²⁴ The point is that the system as a whole is dynamic and interacting, each practice impacting on the evolution of other parties in the system.

Human evolution is also distinct in its symbolic inheritance, defined as “the cross generational acquisition of symbolic concepts, ideologies and perceptions.”²⁵ Such symbolic thought is likely to be unique to humans and is capable of exerting a substantive impact on human perception, agency, and action. It is the social lives of humans that is important to consider in which it is not enough just to look at specific ecological relationships; rather, human niche creation has constructed a world in which humans begin to perceive themselves as somehow apart from the material, living, and ecological niches in which they are embedded. With the increase in population size, the creation of megacities, and so on, the sense of distancing becomes exaggerated. Humans are also what could be termed super-plastic in their responses; morphological and physiological plasticity is accompanied by behavioral and cognitive flexibility when faced with ecological and social challenges.²⁶ Cultural processes are not a veneer laid over a biological or physiological base, nor do cultures behave like genetic traits. Rather, they form a dynamic web of interacting processes that both construct and are constructed by human experience. As Fuentes argues:

A contemporary evolutionary approach has to treat what humans do and experience as a complex system that has specific histories, has inherited ecologies and institutions, and includes a myriad of categories of action and perception as they relate to the interactions between individuals, groups and the communities in which they exist.²⁷

The human niche, according to this model, consists of an individual, the group, which is the main social unit in which the individual is placed, and the community, which includes the main social partners and primary settings with which the individual and group interact. One distinctive feature of the human community concerns shared bonds even in the absence of spatial proximity. This reflects the capacity for hyper-cooperation, one of the key distinctive features of human communities, along with an extended childhood and complex parenting, diverse foraging and hunting

²⁴ O'Brien and Laland, “Genes, Culture and Agriculture.”

²⁵ Fuentes, “The Extended Evolutionary Synthesis,” S16.

²⁶ Claes Andersson, Anton Törnberg, and Petter Törnberg, “An Evolutionary Developmental Approach to Cultural Evolution,” *Current Anthropology* 55.2 (2014): 154–74; Susan Anton, Richard Potts, and Leslie Aiello, “Evolution of Early Homo: An Integrated Biological Perspective,” *Science* 345.6192 (2014), 1–13.

²⁷ Fuentes, “The Extended Evolutionary Synthesis,” S17.

patterns, and novel material and symbolic cultures, which eventually resulted in language.²⁸ The social landscape of humans is critical since while the individual is used in evolutionary models, changes that are evolutionarily relevant take place in interaction with others.

Understanding human evolution through NCT stresses the distinct but dynamic and entangled interactions between humans and their material worlds, including the ecological networks that are integral to these processes. The evolutionary past of *Homo* is not adequately represented just through studies of primates or contemporary foraging communities.²⁹ The common tendencies toward altruism, for example, may act as a baseline for human evolution, but that does not mean it provides a good model for ancestral humans.³⁰ Social traditions emerged in a particular way that was characteristically human. Kim Sterelny puts this aptly: “Ecological and social complexity became fused, as the ecological problem of extracting resources as individuals from a world we did not make became the economic problem of extracting resources collectively from and in a human world.”³¹

The common ancestor between African apes and ancestral humans diverged approximately 8 million years ago, but it is the distinctions within our human lineage relative to the other hominins that demands most explanation.³² Monkeys, apes, and humans all live in complex social groups; are highly cooperative; and have high social cognition, high social reciprocity, and simple tool use. Other “baseline” ancestral traits of the common ancestor include grasping hands, overlapping eyes that are forward facing, a 360-degree rotating arm/shoulder joint, a morphology that allows bi-pedality, and a relatively large brain-to-body size ratio. About 2 million years ago in the *Homo* lineage, there appears to be an extension in the childhood development phase, along with a decrease in the relative tooth size and morphology consistent with walking and running. Stone tools gradually became more complex. The thesis that human evolution happened rapidly just in the sub-lineage *Homo sapiens sapiens* is thus now under dispute.³³

Peter Hiscock has reviewed patterns of learning in a fascinating overview of toolmaking among early hominins.³⁴ Understanding tool use is critically important in order to perceive accurately what drives human abilities to transform the world. The skill involved in knapping is considerable, and one of the questions he asks is why there was so much effort put into gathering and flaking rock in particular ways, beyond that

²⁸ Agustín Fuentes, “Integrative Anthropology and the Human Niche: Toward a Contemporary Approach to Human Evolution,” *American Anthropologist* 117.2 (2015): 302.

²⁹ Kim Sterelny and Peter Hiscock, “Symbols, Signals and the Archaeological Record,” *Biological Theory* 9.1 (2014): 1–3; Ken Sayers, Mary Ann Raghanti, and C. Owen Lovejoy, “Human Evolution and the Chimpanzee Referential Doctrine,” *Annual Review of Anthropology* 41 (2012): 119–38.

³⁰ Katherine MacKinnon and Agustín Fuentes, “Primates, Niche Construction and Social Complexity, Origins of Altruism and Cooperation,” in *Origins of Altruism and Cooperation*, (eds.) R.W. Sussman and C.R. Cloninger (Dordrecht: Springer Science, 2011), 121–43.

³¹ Kim Sterelny, “Social Intelligence, Human Intelligence and Niche Construction,” *Philosophical Transactions of the Royal Society B* 362.1480 (2007): 728.

³² As summarized by Fuentes, “Integrative Anthropology and the Human Niche,” 307–8.

³³ Andersson et al., “An Evolutionary Developmental Approach” Kim Sterelny, “A Paleolithic Reciprocity Crisis: Symbols, Signals and Norms,” *Biological Theory* 9.1 (2014): 65–77.

³⁴ Peter Hiscock, “Learning in Lithic Landscapes: A Reconsideration of the Hominid ‘Toolmaking’ Niche,” *Biological Theory* 9.1 (2014): 27–41.

which would be required for tool use, and teaching others to do so as well. What was going on in the minds of these early hominins? Were these tools integral to “a narrative arc of decisions that produced objects that could act as signals to others”?³⁵ Debates have focused around the “tools” of the Oldowan period around 2.6 million years ago and the handaxes of the Acheulian, 1.6–1.7 million years ago. The Oldowan tools also gradually became elaborated concurrent with the newer Acheulian. The handaxes of the Acheulian show high levels of symmetry that is technically extremely hard to achieve.³⁶ The classic explanation that this marks the arrival of “man the toolmaker,” giving these hominins superiority in hunting success, is only a partial explanation. It also does not explain why there is a change in morphology of the stone tools over time, given that all the morphologies were equally multifunctional. For example, elongated flakes or blades occurred intermittently over half a million years, and small back-blunted flakes called microliths were in and out of circulation since the late Lower Paleolithic over a period of 300,000 years. There is also evidence that the specific rocks used were in some cases transported a considerable distance, as part of the resource mapping capabilities of early hominins. Hiscock’s preferred hypothesis is that lithic crafts were part of a costly signaling system of apprentice teaching and learning. This was more than associative learning since the skill of knapping is not easily observed; hence social learning combined with gestural language was likely to be significant. Apprentices learn by close observation, imitation, and instruction by skilled practitioners over many hours. This context selected for cognitive and physical capabilities and such social learning could then be adopted for other tasks.³⁷ Hiscock also suggests a potential role for public performance of production, along with food exchange or other social status rewards for those especially skilled in knapping. At all time periods, the hominins scavenged and recycled specimens discarded by others, and landscapes filled with lithic artifacts are like a library of designs and production processes. Crafts of stone making are observable in the community of Langda in Papua Province, Indonesia.³⁸ Toolmaking skills are developed in a social context of a supportive group and act as a source of pride and personal identity.³⁹ The point is

³⁵ *Ibid.*, 28.

³⁶ Even the simplest lithic tools are likely to have demanded hundreds of hours of practice. Dietrich Stout, “Stone Toolmaking and the Evolution of Human Cognition,” *Philosophical Transactions of the Royal Society B. Biological Sciences* 366 (2011): 1050–59. Stout suggests that “discovery of optimal technologies might be facilitated by social scaffolding, explicit instruction or high-fidelity imitation of an expert model, but minimally requires focused attention, self-monitoring and inhibition of automatic reactions during repetitious practice” (1057).

³⁷ Kim Sterelny, *The Evolved Apprentice: How Evolution Made Humans Unique* (Cambridge, MA: MIT Press, 2012).

³⁸ Dietrich Stout, “The Social and Cultural Context of Stone-Knapping Skill Acquisition,” in *Stone Knapping: The Necessary Conditions for a Uniquely Human Behaviour*, (eds.) V. Roux and B. Bril (Cambridge, MA: McDonald Institute for Archaeological Research, 2005), 331–40.

³⁹ Individual practice over many hours is encouraged by its positive social value and supported by instruction, demonstration, and assistance from those who are more experienced in what is termed a “social scaffold,” which promotes learning by individuals. It is also possible to go a step further and show that the same neural circuitry in sensory motor learning is also required for new roles in abstract reason and eventually language. Vittorio Gellese and George Lakoff, “The Brains Concepts: The Role of the Sensory-Motor System in Conceptual Knowledge,” *Cognitive Neuropsychology* 22.3/4 (2005): 455–79.

that the lithic niche that developed very early in human evolution was a crucial step in developing the distinctive human world that eventually gave rise to *Homo sapiens sapiens* and our profound abilities to transform our world.

Along with physical skill and cognitive development associated with lithic crafts, there is also evidence of enhancement in personal qualities of self-control and persistence and also the ability to imagine alternatives.⁴⁰ Penny Spikins investigates the distinctive capacity for long-term compassion in early hominins.⁴¹

In addition to distinct forms of compassion, the ability to navigate social relationships successfully must have been important in the development of collective efforts toward more and more sophisticated tools. Hiscock believes that competition between skilled individuals was significant in the enlargement of the human lithic niche.⁴² Spikins argues, instead, for an increase in trust between novices and practitioners. In practice, of course, both competitive interactions and cooperative ones are likely to have existed simultaneously. So, as well as the construction of a new physical niche, the social patterns and rules for interaction between humans became more sophisticated. Elements of practical wisdom, including accurate memory and the ability to predict the future—foresight—are integral to distinctively human social development.⁴³ The point to be made here is that along with tool use came a number of specific social capacities that are important in navigating the complex social world of human societies. The legacy of tool use is thus double-edged: it gives humanity incredible power of transformation of the material world, but it has *also* enabled the evolution of moral norms and eventually language, which are relevant to finding ways to solve complex problems facing human societies today.

Theological anthropology in the Anthropocene

Thus far, I have taken account of new theories of evolutionary biology that give much more precedence to ecological niches when considering the driving forces of evolutionary change. Biologists have moved away from close attention to genes alone to consider four key additional factors of development: plasticity, epigenetics,

⁴⁰ Hiscock, "Learning in Lithic Landscapes," 34–5.

⁴¹ Evidence for long-term compassion goes back at least 1.5 million years ago and can be tracked from the discovery of individuals with chronic disease. Penny Spikins, Holly Rutherford, and Andy Needham, "From Homininity to Humanity: Compassion from the Earliest Archaics to Modern Humans," *Time and Mind* 3.3 (2010): 303–25; Penny Spikins, *How Compassion Made Us Human: The Evolutionary Origins of Tenderness, Trust and Morality* (Barnsley: Pen and Sword Archaeology, 2015). See Celia Deane-Drummond, "Empathy and the Evolution of Compassion: From Deep History to Infused Virtue," *Zygon* 52.1 (2017): 258–78.

⁴² Hiscock dismisses Spikins's suggestion of the importance of going beyond self-interest and self-control in the lithic arts that then leads to increased trust and reduced violence; Hiscock, "Learning in Lithic Landscapes," 30 (citing Penny Spikins, "Goodwill Hunting: Debates over the Meaning of Lower Palaeolithic Handaxe Form Revisited," *World Archaeology* 44 (2012): 378–92). He presupposes alternative mental signaling motivations, such as competition between rivals.

⁴³ Celia Deane-Drummond, "Practical Wisdom in the Making: A Theological Approach to Early Hominin Evolution in Conversation with Modern Jewish Philosophy," in *The Evolution of Human Wisdom*, (eds.) Celia Deane-Drummond and Agustin Fuentes (Lanham: Lexington/Rowman & Littlefield, 2017).

learning behavior, and symbolic thought. I have illustrated how human evolution in particular depended on learning skills that lent themselves to cognitive enlargement and increasingly sophisticated cooperative practices, including abilities for long-term compassion and creative imagination, alongside practical wisdom. Religion, at least in its institutional form, arrives much later in evolutionary history in the community niche confined to *Homo sapiens sapiens*. So far, the historical narrative that I have told rests on accepted secular scientific principles and adopts philosophical premises based on a broad evolutionary naturalism. This account is crucial, however, for enabling a richer understanding of the place of humanity in the world and its distinctive abilities to construct and build that world in a way that appears to be distinctive for the *Homo* lineage. What evolutionary anthropology attempts to resist, however, insofar as it keeps to its agenda as a biological science, is making any explicit recommendations for human action, including actions that are ecologically relevant. As wedded to cultural relativism, it can observe the breakdown in our abilities to construct our world in tune with ecological understanding, but in general it cannot tell us what to do next or evaluate what that world might look like.⁴⁴ However, not all scholars who draw on NCT are as reserved. Geographer Erle Ellis weaves NCT into a concept of sociocultural evolution through what he terms is a new anthro-ecology.⁴⁵ I think it is important here to distinguish between NCT as a descriptive task of humanity living in embedded ecological relationships and the way this is then woven into a grand narrative of a “better” Anthropocene that puts particular emphasis on the technological power of humans. Lisa Sideris finds the two processes seamless, critiquing both David Sloan Wilson’s and Erle Ellis’ use of the EES as ways of promoting the self-direction of human evolution.⁴⁶ I view such elements in Ellis and Wilson as subtle forms of scientism along with an implicit eschatological impulse that relies on human powers in a way that can easily become unqualified and hubristic. Theology is permitted a much greater boldness in this respect since it works on the premise that there is a divine rather than simply human purpose or *telos* in the world as created, and that humanity has a significant role to play in working out that purpose, but one that needs to be conducted in all humility with other life forms, not least because all human beings are made in the divine image, *imago Dei*, and so have the responsibility to act in a way that honors the goodness of all that is.⁴⁷

Theological anthropology is, however, still able to weave some insights from evolutionary anthropology into its account of what it means to be human, and it

⁴⁴ Cultural relativism has become the accepted norm in evolutionary anthropology because of fears over historical neocolonial practices by missionary anthropologists.

⁴⁵ Erle C. Ellis, “Ecology in an Anthropogenic Biosphere,” *Ecological Monographs* 85.3 (2015): 287–331. For discussion of this article, see blog posts on *Inhabiting the Anthropocene*, <https://inhabitingtheanthropocene.com/2016/05/05/video-of-ellis-talk-and-panel-discussion/>, accessed October 24, 2017.

⁴⁶ Lisa Sideris, “Surviving the Anthropocene Part 2: Of Omega Points and Oil,” posted July 8, 2016. <https://inhabitingtheanthropocene.com/2016/07/08/surviving-the-anthropocene-part-2-of-omega-points-and-oil/>, accessed October 24, 2017. I would like to thank Lisa Sideris for referring me to this blog post and drawing attention to Ellis’s work.

⁴⁷ Some theologians have resisted using this term because of its associations with classical hierarchical notions of theological anthropology that stress difference and superiority over and against other animal kinds.

recognizes the importance of taking account of our historical origins. The shifts in cognitive capacities that seem to be accompanied by social skills were also, from a theological perspective, accompanied by a dawn of spiritual awareness as well. This sensitivity for the transcendent is implied by the attention to beauty and art in even the earliest hominin species. It is difficult, if not impossible, to tie down a specific time when revealed knowledge entered the human landscape. But the interpretation of religious experience is bound to be rather different from an evolutionary anthropological perspective. For the latter, religious experience is bound up with evolutionary emergence of cognitively advanced humans. For theologians, that same experience can be part of an overall drama of human and ecological histories, a dynamic performance in which God acts in ways that demonstrate more clearly to human beings an active presence of the divine in the world.⁴⁸ Inclusion of God in narratives about the human means that human histories are not simply on a trajectory of human progress and increase in skill development. Rather, there is another ultimate *telos* in view that supersedes scientific explanations, namely, trust in divine providence.

Vigorous discussion among religious studies scholars has arisen about whether other animals could also sense the presence of the divine, given that religious experience is just as much about emotive affects as cognition.⁴⁹ Donovan Schaefer engages with evolutionary atheism and the theories of Richard Dawkins and Daniel Dennett.⁵⁰ He critiques their stress on genetics, rationality, and the intentional adaptationist stance of evolution with its stress on “Design Space” and puts in its place what he considers the newer pluralist approaches to evolution in the work of Steven Rose and Stephen Jay Gould. Their stress on chance and contingency aligns with Jacques Derrida’s rejection of Enlightenment metaphysics.⁵¹ Schaefer believes that the newer approaches are epitomized in Stephen J. Gould’s proposal for evolution “as the production of embodied histories in an awkward sedimentation of accidents,” including co-option of past evolutionary histories in new ways.⁵² While contingency is an important facet of EES, it is more complicated than Schaefer allows for here. His particular attention to Gould seems to stem from resonance with his own project to develop a theory of affect. Hence, his characterization of modern evolutionary theory portraying “man as an adapted organism, fearfully and wonderfully made, but also imperfectly adapted because he is a patchwork thrown together, bit by bit, without a plan, remodeled opportunistically as occasions permitted”⁵³ only really tells part of what evolutionary anthropology attests. While greater attention to emotive aspects of religious experience is helpful, it seems unlikely that this could be meaningful without a cognitive component. Even the earliest hominins prior to the arrival of language could have experienced the emotive

⁴⁸ For further discussion, see Celia Deane-Drummond, *The Wisdom of the Liminal: Evolution and Other Animals in Human Becoming* (Grand Rapids: Eerdmans, 2014).

⁴⁹ Donovan Schaefer, *Religious Affects: Animality, Evolution and Power* (Durham: Duke University Press, 2015).

⁵⁰ *Ibid.*, 147–57.

⁵¹ *Ibid.*, 155–63.

⁵² *Ibid.*, 162.

⁵³ *Ibid.*, 164–5. It is disappointing that in making his claims, Schaefer ignores evolutionary anthropology research, relying on popular atheistic accounts of evolution and their rebuttal by scientists such as Stephen Gould whose last work was published posthumously in 2002.

power of the transcendent and made initial attempts to communicate that experience through material artifacts. A theologian would want to stress that human beings are not just driven by internal social demands for competition or even cooperation but are responsive to spiritual realities that speak of an inner call that seems to reach even beyond human imaginings. With that awareness came the possibility of deliberately turning away and resisting divine prompting. That transition is one that theologians narrate in terms of the fall of humanity.⁵⁴ It is unlikely, though not impossible, that such a transition happened at the earliest stages of human evolution since a religious sense of being addressed by the divine is only feasible with the advent of symbolic thought and eventually language.⁵⁵ But the point is that the presence of God as an affective and actively revealed presence is bound up with deep human history and the slow but sure development of human abilities to recognize and transform our world.

Human abilities to construct our world in a positive way seem to have run amok, detached from the social tapestry that bound human beings together in close-knit communities of apprentice learning. For advocates of a good Anthropocene, technological powers will potentially be salvific, but decisions in this case are limited to a narrow category of empowered humans living in the richer nations of the world. Is this one dimension in understanding the impact of the theological concept of the fall of humanity? Pope Francis has termed this eruption of the technological world in contemporary societies the “technocratic paradigm.” “The modification of nature for useful purposes has distinguished the human family from the beginning; technology itself ‘expresses the inner tension that impels man gradually to overcome material limitations.’”⁵⁶ Pope Francis recognizes that technology has the potential to produce art and “enable men and women immersed in the material world to ‘leap’ into the world of beauty.”⁵⁷ But the power of technology in the manner that is currently being used is highly ambiguous in its outcomes, so “we stand naked and exposed in the face of our ever-increasing power, lacking the wherewithal to control it.”⁵⁸

The point is that there has been a shift away from an active appreciation of the material world and attunement to what was possible in it through patient learning and acquisition of self-control, wisdom, and perhaps even compassion⁵⁹ to one that is impatient, aggressive, and confrontational: the planet is being “squeezed dry beyond every limit.”⁶⁰ And one of the background philosophical shifts in making this possible is the adoption of a scientific method as a universal way of knowing that absorbs and reduces the human and social world around us.⁶¹ In as much as evolutionary

⁵⁴ See Celia Deane-Drummond, “In Adam All Die? Questions at the Boundary of Niche Construction, Community Evolution and Original Sin,” in *Evolution and the Fall*, (eds.) James K.A. Smith and William Cavanaugh (Grand Rapids: Eerdmans, 2017), 23–47.

⁵⁵ Evolutionary anthropology cannot be mapped directly onto the biblical account since the purpose of the latter was very different.

⁵⁶ Pope Francis, *Laudato Si'*, §102.

⁵⁷ *Ibid.*, §103.

⁵⁸ *Ibid.*, §105.

⁵⁹ Spikins argues that the earliest humans eventually extended compassionate care toward material objects. This stage was subsequent to the development of long-term compassion toward other human beings in the same group. Spikins et al., “From Homininity to Humanity,” 317.

⁶⁰ Pope Francis, *Laudato Si'*, §106.

⁶¹ *Ibid.*, §107.

anthropology admits to the possibility of religion as part of a cultural niche, it permits its significance. But that way of understanding religion is only one way and does not, generally at least, take sufficient account of religious experience from the inside, though that is beginning to change with new methods in cultural anthropology that allow for an explicit theological perspective.⁶²

The aspiration in such a movement is one that puts technology in its proper place, so it is the opposite of the ecomodernist approach to solving problems in the Anthropocene.⁶³ The difference between early hominin evolution and the present realities faced in contemporary societies is that the tools of our own making have now come to dominate the global human landscape to such an extent that they have undercut the social worlds that were originally developed in deep history through their formation. Yet the earliest humans also faced incredible environmental challenges associated with drastic changes in climate and very real threats to survival from large predators and megafauna that anthropologists consider was at least one factor in cognitive development.

The complex political and social institutions that have a vested economic interest in a dominating form of global technology make any widespread change in technological use incredibly complicated and difficult to achieve. Pope Francis insists that we need to recover our abilities to see the “mysterious networks of relationships between things.”⁶⁴ Looking at the deep history of the human race provides a reminder of the importance of those relationships. Pope Francis describes a cultural process that seems to press for that change even in the midst of technological cultures. So “an authentic humanity, calling for a new synthesis, seems to dwell in the midst of our technological culture, almost unnoticed, like a mist seeping gently beneath a closed door. Will the promise last, in spite of everything, with all that is authentic rising up in stubborn resistance?”⁶⁵

One aspect of what that mist might mean is greater attention to dialogue between science and religion.⁶⁶ Given the shift toward greater openness to relational ways of knowing within evolutionary theory, the time seems ripe for thinking about what it means to be human through a theological lens as well as through the dominant neo-Darwinian paradigm that has absorbed cultural models of limitless progress, including

⁶² It is harder for those committed to evolutionary anthropology to publish work that uses explicit theological language. Cultural anthropologist Eloise Meneses argues for a more integrated approach on the basis that the epistemological starting point for ethnography has been too narrowly circumscribed and has not allowed the perspectives of their informants to become critical tools. This perspective has not yet become accepted in evolutionary anthropology. Eloise Meneses and David Bronkema (eds.), *On Knowing Humanity: Insights from Theology for Anthropology* (New York: Routledge, 2017).

⁶³ For a critical commentary on eco-modernist views, see Clive Hamilton, “The Theodicy of the ‘Good Anthropocene,’” *Environmental Humanities* 7 (2015): 233–8. Given that the development of technological skills happened so far back in human history, many anthropologists are more inclined to label the geological era of the Anthropocene as more or less coincident with the Holocene, starting with the advent of modern agriculture 60,000 years ago after migration of our early hominin ancestors from the African subcontinent rather than creating a new Anthropocene era that begins with the massive explosion in industrialized technologies in the eighteenth century. Michael Balter, “Archeologists Say the ‘Anthropocene’ Is Here—But It Began Long Ago,” *Science* 340 (2013): 261–2.

⁶⁴ Pope Francis, *Laudato Si’*, §20.

⁶⁵ *Ibid.*, §112.

⁶⁶ *Ibid.*, §62.

economic analysis. At the same time, from a theological perspective, taking account of evolutionary anthropology is a fruitful exercise in engaging with material history and providing a backdrop to thinking theologically about human meaning and becoming. The category of performance has been important in human toolmaking from the very start of early human history, and human interactions with material culture, their tools, other animals, and other human beings are integral to human history understood in terms of movement.⁶⁷ Agency is not something that humans *have* or possess but unfolds in the movement of life and its set of actions and relationships.⁶⁸

Conclusion

I have argued in this chapter that ecological awareness necessarily needs to pay close attention to evolutionary theories, not least because the most recent theories bring in ecological understanding as an integral part of evolutionary change. Rather than a single-trait model for evolutionary adaptedness through the weak (negative) force of natural selection, NCT embedded in EES implies a dynamic system that includes genetic change within a broader scope environment, which is itself made up of living bodies that are themselves changing. That dynamic movement within evolutionary change also includes the possibility of active agency on the part of actors in the system, thus creating the possibility of living beings actively contributing to evolutionary change. Development, plasticity, epigenetics, behavioral learning, and symbolic thought are all factored into EES theory. These different dimensions of heritability open up the possible significance of religious belief as an integral part of the human niche. Tracing deep human history of the lives of the earliest hominins living some 1 or 2 million years ago demonstrates the long *durée* of the intimate relationship between human beings and their technologies. A comparison of lithic technologies shows remarkable attention to aesthetic fine-tuning of these tools that went beyond obvious functional purposes. This window into beauty in even the earliest human species, long before *Homo sapiens* first walked the savannah, opens up a remarkable history of cognitive and social development. While it is difficult to provide concrete proof, a theological interpretation of the lives of these early hominins would include spiritual development alongside the emotive and cognitive development. Recognizable religious traditions emerged much later, but that does not mean that all forms of religious experience were impossible. A theological interpretation adds another interpretative layer to evolutionary anthropology, namely, enveloping human performative practices in relation to God's action in the world, signifying both an inner world of becoming and an outer world of making orientated toward the improvised charter of divine providence. An assertion that human technological tools are sufficient to solve the problems of living in the Anthropocene, whether reinforced by the newer evolutionary theories

⁶⁷ Tim Ingold, *The Perception of the Environment: Essays on Livelihood, Dwelling and Skill* (Abingdon: Routledge, 2000). Ingold stresses the idea that there is movement of the social life in, not on, a landscape, a way of being in the world that is environmentally attuned to that world.

⁶⁸ Also noted by Joanna Zylinska, "On Life, Movement and Stoppage: Agency and Ethics in the Anthropocene," *Leonardo* 28.2 (2015): 180–1.

or not, amounts to a refusal in humility, a refusal to accept that humanity has gone off course in its eclipse of social intimacy under the banner of technological progress. It is not surprising that some religious studies scholars are turning to affect and animality to solve these problems. Yet the cognitive should go hand in hand with the affective and spiritual modes of human being in the world: they are bound up together in human being and becoming, and our futures will be poorer if any one element is left behind. Treating the evolution of humanity through an eco-systems approach has its advantages, but the importance of the individual should not be overlooked. A theological anthropology that retains a qualified version of humanity made in the image of God will insist on the dignity of each and every person in developing a human ecology that is capable of facing the enormous ecological challenges that confront this and future generations.

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