

# Climate Change and Climate Change Policy as Human Sacrifice: Artifice, Idolatry, and Environment in a Technological Society

By Noah J. Toly

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## Introduction

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Europe's summer of 2003 was the hottest since the sixteenth century, and more than 19,000 deaths on the continent were attributed to the oppressive heat.<sup>1</sup> While no single weather event can be credited to global warming, researchers have pointed to the consistency of this summer heat wave with the predicted patterns of climate change, also noting increased average temperatures of European winters and the fact that the past three decades have been the region's hottest since the advent of instrumented readings in 1750. Research also indicates a dramatic acceleration in climate change, as the summer of 2003 exceeded average summer temperatures of the period 1901 – 1995 by 2.0° Celsius.

Climate change reveals an unprecedented level of human intervention in ecological systems and processes. As Paul Crutzen and Eugene Stoermer write, "Considering... 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."<sup>2</sup> Among the challenges of this era, global climate change is one of the greatest. Again, as Crutzen and Stoermer write, "because of the anthropogenic emissions of CO<sub>2</sub>, climate may depart significantly from natural behaviour over the next 50,000 years."<sup>3</sup>

Our ability to transform the chemistry of the atmosphere through pollution and managed intervention reflects an increasing scale and scope for human ecological impact—accidental, incidental, and purposed. Recognizing this capacity,

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In this essay, **Noah J. Toly** argues that climate change and the current international climate regime embodied in the Kyoto Protocol represent practices of human sacrifice unique to contemporary technological society. Deploying a critique based upon the theory of Jacques Ellul, Mr. Toly demonstrates that climate change and climate policy epitomize the characteristic artifice and idolatry of technological society, while also offering a modest contribution to Christian political ethics of environment focused upon the principles of stewardship, justice, and freedom. Mr. Toly is a Research Fellow and Assistant Professor at the University of Delaware's Center for Energy and Environmental Policy.

many have heralded the demise of nature as an independent reality.<sup>4</sup> As Byrne et al write, "Nature *routinely* bears the imprint of human influence.... Not only is nature denied autonomous standing and development, but its future becomes dependent upon social direction."<sup>5</sup> Technical developments have made possible previously inconceivable levels of human interference in the ecological order.

These developments implicate heightened human accountability for global environmental integrity and for the social relations mediated through the distribution of environmental goods and ills. Calvin DeWitt writes:

Our species, in contrast with every other, affects... biospheric dynamics on a grand and pervasive scale and it is this that brings us from time to time to assess our impact on the earth. In our day, we find, remarkably, that we have become a principal geological force. We find ourselves to have significantly restructured the biosphere both biogeographically and trophically. And unlike the assessment a half-century ago that examined our role, today's assessment recognizes our domination. During the past half-century, Earth has come under human domination, and this has propelled us into a new role: stewards of the biosphere.<sup>6</sup>

Acknowledging this heightened accountability and drawing upon the insights of Jacques Ellul (1912 – 1994), I will demonstrate that anthropogenic climate change and international climate change policy are unique to a technological society and that more than 150,000 climate change-related deaths per year represent a practice of human sacrifice that exposes idolatrous underpinnings of this peculiar civilization. The article concludes with a measured contribution to a Christian political ethic of environment based upon the principles of stewardship, justice, and freedom.

## The Environment in a Technological Society

Ellul, a French theologian and social theorist, was one of the most prolific scholars of the twentieth century and perhaps the greatest critic of technology's place in contemporary society. At first glance, he seems an ill-suited guide to environmental crisis. While his activism reflected a measure of concern for the natural environ-

<sup>1</sup>Jurg Luterbacher et al., "European Seasonal and Annual Temperature Variability, Trends, and Extremes since 1500," *Science* 303, 5663 (2004).

<sup>2</sup>Paul J Crutzen and Eugene F Stoermer, "The 'Anthropocene,'" *Global Change Newsletter* 41 (2000). See also Paul J Crutzen, "Geology of Mankind," *Nature* 415, 3 (2002).

<sup>3</sup>Crutzen and Stoermer, "The 'Anthropocene'."

<sup>4</sup>For one among a host of recent publications, see Bill McKibben, *The End of Nature* (New York: Anchor, 1999).

<sup>5</sup>John Byrne, Leigh Glover, and Cecilia Martinez, "The Production of Unequal Nature," in *Environmental Justice: Discourses in International Political Economy*, ed. John Byrne, Leigh Glover, and Cecilia Martinez, *Energy and Environmental Policy* (New Brunswick, NJ: Transaction Books, 2002), 281. See also John Byrne, Cecilia Martinez, and Steven Hoffman, "The Social Structure of Nature" (paper presented at the 6th Annual Technological Literacy Conference, February 1991).

<sup>6</sup>Calvin B. DeWitt, "Biogeographic and Trophic Restructuring of the Biosphere: The State of the Earth under Human Domination," *Christian Scholar's Review* XXXII: 4 (2003): 347.

ment and for what might be described today as environmental justice,<sup>7</sup> ecological questions received relatively little attention in his extensive scholarly contributions. Upon closer examination, however, Ellul seems an apt selection, offering one of the most penetrating analyses of technological society from which contemporary environmental crises cannot be divorced and presenting explicit, while rare, insights into the state of nature in a technological society.<sup>8</sup> Furthermore, Ellul's profound critique is coupled with a deep Christian commitment, making his analysis an appropriate, if surprising, foundation for this article.<sup>9</sup>

In his 1964 book, *The Technological Society*<sup>10</sup> (for which the English title is an unfortunate translation of what should be *The Technical Society*, or simply *Technique*), Ellul described the pervasiveness of technique, the contemporary hegemonic version of which he defined as "the totality of methods rationally arrived at and having absolute efficiency (for a given stage of development) in every field of human activity."<sup>11</sup> Technique is the search for the "one best way,"<sup>12</sup> and includes all means – not simply the machines of industry and convenience with which we so often associate technology. Ellul wrote of economic technique, political technique, medical technique, and educational technique, among others, offering a glimpse of its totalizing and integrating characteristics.<sup>13</sup>

<sup>7</sup>Jacques Ellul, *Perspectives on Our Age: Jacques Ellul Speaks on His Life and Work*, ed. William H Vanderburg (Concord, ON: House of Anansi Press, 1997), 25 - 26.

<sup>8</sup>See, for example, Ellul's comments on three questions of ecological justice: nuclear waste – Jacques Ellul, *The Technological Society*, trans. John Wilkinson (New York: Vintage Books, 1964), 109.; the enclosure of the commons – Ellul, *The Technological Society*, 56 - 57.; and the pollution of the Arcachon basin in the French region of Aquitaine – Jacques Ellul, *The Technological Bluff*, trans. Geoffrey Bromiley (Grand Rapids, MI: Wm. B. Eerdmans Publishing Co, 1990), 299. See also Jacques Ellul, "The Relation of Man to the Creation According to the Bible," in *Theology and Technology: Essays in Christian Analysis and Exegesis*, ed. Carl Mitcham and Jim Grote (Lanham, MD: University Press of America, 1984a).; Jacques Ellul, "Technique and the Opening Chapters of Genesis," in *Theology and Technology: Essays in Christian Analysis and Exegesis*, ed. Carl Mitcham and Jim Grote (Lanham, MD: University Press of America, 1984b). For other Ellulian analyses of environmental issues, including climate change and biodiversity loss, see several articles in the February 2005 issue of the *Bulletin of Science, Technology, and Society*, including John Byrne and Leigh Glover, "Ellul and the Weather," *Bulletin of Science, Technology, and Society* 25:1 (2005).; Noah J Toly, "A Tale of Two Regimes: Instrumentality and Commons Access," *Bulletin of Science, Technology, and Society* 25:1 (2005).

<sup>9</sup>It should be noted that Ellul is among many scholars who have engaged the question of technology's role in contemporary society from an explicitly Christian perspective. Among recent scholarship evaluating the relationship between Christianity and a technological society are Albert Borgmann, *Power Failure: Christianity in the Culture of Technology* (Grand Rapids, MI: Brazos Press, 2003).; Murray Jardine, *The Making and Unmaking of Technological Society: How Christianity Can Save Modernity from Itself*, ed. David S Cunningham and William T Cavanaugh, *The Christian Practice of Everyday Life* (Grand Rapids, MI: Brazos Press, 2004). While many have made important contributions to the field of study, the sweeping trajectory of Ellul's work is unique.

<sup>10</sup>Ellul, *The Technological Society*.

<sup>11</sup>*Ibid.*, xxv.

<sup>12</sup>*Ibid.*, 79.

<sup>13</sup>For a limited typology of technique, see Jacques Ellul, "Ideas of Technology: The Techno-

Ellul's pointed critique emphasized the emergence of technique as a new milieu for human activity – the third in a series that includes the milieus of nature and of society.<sup>14</sup> While the technical milieu “was meant to be a buffer between man and nature,” offering the capacity to transcend limits and freeing society from necessity, it has developed considerably beyond this mediating role.<sup>15</sup> “Unfortunately,” Ellul wrote, “[the technical order] has evolved autonomously in such a way that man has lost all contact with his natural framework and has to do only with the organized technical intermediary which sustains relations both with the world of life and with the world of brute matter.”<sup>16</sup> In a theme repeated throughout much of his work, the technical means has become the end in what Ellul described as a “triumph of the absurd.”<sup>17</sup>

Despite limited reference to environmental issues, Ellul was particularly concerned with this technical milieu as an artificial replacement for the natural – both human and ecological. He noted that technique, in its current dominating form, “is opposed to nature,” elaborating:

The world that is being created by the accumulation of technical means is an artificial world and hence radically different from the natural world. It destroys, eliminates, or subordinates the natural world, and does not allow this world to restore itself or even to enter into a symbiotic relation with it. The two worlds obey different imperatives, different directives, and different laws which have nothing in common. Just as hydroelectric installations take waterfalls and lead them into conduits, so the technical milieu absorbs the natural. We are rapidly approaching the time when there will be no natural environment at all. When we succeed in producing artificial *aurorae boreales*, night will disappear and perpetual day will reign over the planet.<sup>18</sup>

For Ellul, this artifice, while profoundly important, was a sufficiently obvious characteristic of technological society as to merit only brief attention in his “characterology of technique.”<sup>19</sup>

Despite the concision with which Ellul treated the question of artifice, it is possibly his most important contribution to the question of the environment in a technological society. He indicated the potential for the construction of an environment of technology, while at the same time suggesting the possibility of a technicized ecology. In other words, Ellul implied that humans now function within technique

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logical Order,” *Technology and Culture*. Exemplary of Ellul's approach to various non-material techniques is his book, *Propaganda: The Formation of Men's Attitudes* (New York: Vintage Books, 1965).

<sup>14</sup>Jacques Ellul, *What I Believe*, trans. Geoffrey Bromiley (Grand Rapids, MI: W. B. Eerdmans Publishing Co, 1989), 87 - 140.; Ellul, *Perspectives on Our Age: Jacques Ellul Speaks on His Life and Work*, 59 - 64. For an excellent summary of Ellul's theory of the three milieus, see Richard Stivers, *Technology as Magic: The Triumph of the Irrational* (New York: Continuum International Publishing Group Inc, 2001), 16 - 28.

<sup>15</sup>Ellul, *The Technological Society*, 428.

<sup>16</sup>*Ibid.*, 428.

<sup>17</sup>Ellul, *The Technological Bluff*, 199 - 242.

<sup>18</sup>Ellul, *The Technological Bluff*, 79.

<sup>19</sup>*Ibid.*, 64 - 148.

– it has become their chief context; this even as the technical subsumes the natural in the establishment of a “techno-nature,”<sup>20</sup> represented by, among other symbols, the genetically modified organism.

I propose that such technical modification of the natural proceeds along three lines: accidental, incidental, and purposed. The first includes the grand accidents of a distinctly technological society – such events as the Exxon-Valdez and Chernobyl disasters. Incidental modification implies the attendant (and possibly catastrophic) modification of ecological systems and processes as a cumulative result of technical development and arising from the normal operations of technological society. In this case, unexceptional causes have extraordinary consequences, of which the current crisis of biodiversity loss serves as an example. A third mode by which the technical order modifies the natural is purposed intervention, which includes efforts to manage ecological systems and processes that were previously not subject to intentional human manipulation. Among the many illustrations is genetic engineering. This purposed mode presents the distinct possibility of nature’s “transformation entirely from a phenomenal order to a value vector that meets the needs and interests of technological civilization.”<sup>21</sup> By any of these three modes, ecological alteration is made possible at grand scales only by the collective effect of relatively recent technical developments. As Byrne et al. write:

Until very recently, the human imprint was confined to the geography of nature-society relations. Specific areas and discrete social and ecological systems were exploited and/or risked by modernity.... [N]ow all of nature has become available to human ends. A crucial attribute of this phase is that the ‘total reach’ of human impact is now recognizable, at least among members of expert sections of knowledge society. Empowered by this recognition, projects in knowledge society anticipate an ability to embody nature as a whole in human knowledge. From genetic modification to ecological management, the Global North aspires to realize nature as a system organized and managed by human intelligence.<sup>22</sup>

All three modes of modification demonstrate this increasing scale and scope for the alteration of ecological systems and processes, advancing the artifice of the technical order.

## The Changing Climate of a Technological Society

Examples of the artifice described by Ellul include various human dimensions of environmental change which testify to the usefulness of this typology; perhaps none so vividly display its value as the crisis of climate change. The chemical composition of the atmosphere is now largely of our own making – initially an incidental effect of industrialization and its attendant pollution and more recently the effect of a purposed effort to manage climate by technical means. As DeWitt writes,

<sup>20</sup>Arturo Escobar, “After Nature: Steps to an Antiessentialist Political Ecology,” *Current Anthropology* 40:1 (1999).

<sup>21</sup>Byrne, Glover, and Martinez, “The Production of Unequal Nature,” 281.

<sup>22</sup>*Ibid.*, 280.

"While in earlier days, earth's atmosphere and climate were more or less stable 'givens' in human life, they are no longer. They have been impacted by human activity and invention that reach to the lower heavens."<sup>23</sup> Both climate change and international climate change policy are driven by technique and are consistent with the artifice of the technical milieu.

### *Anthropogenic Climate Change*

While evidence of climate change has only recently emerged,<sup>24</sup> the phenomenon is far from novel. Geological records indicate previous dramatic shifts in global average surface temperature accompanied by associated changes in regional and local climates.<sup>25</sup> These shifts have been attributed to various natural causes and associated positive feedback loops related to, among other phenomena, slight shifts in the orbit of the earth, variability in solar irradiance, dramatic changes in the reflectivity of the planet, and volcanic activity.<sup>26</sup> The analogous contemporary phenomena of global warming and climate change, however, are set apart from these earlier episodes by increased impact upon human population and anthropogenesis.

The evidence of climate change is overwhelming. Research demonstrates that the average surface temperature of the earth has increased by 0.6° C since 1900, contributing to highly differentiated deviations from normal weather patterns across the globe.<sup>27</sup> However, while the phenomenon itself is generally incontrovertible, its causes have been hotly disputed. Although much evidence points to contemporary climate change as anthropogenic, a portion of the scientific community contests such a position, arguing instead that the phenomenon is natural in origin.

Despite persistent debate, with the emergence of climate change as a field of inquiry in its own right, a strong consensus has been built in support of anthropogenesis. The Intergovernmental Panel on Climate Change (IPCC), a consensus-based scientific advisory group,<sup>28</sup> finds compelling evidence for the anthropogenic nature of the phenomenon, attributing its development to two chief causes: land

<sup>23</sup>DeWitt, "Biogeographic and Trophic Restructuring of the Biosphere," 351.

<sup>24</sup>For an interesting and highly accessible history of inquiry into climate change, see Spencer R. Weart, *The Discovery of Global Warming*, ed. Margaret C. Jacob, Spencer R. Weart, and Harold J. Cook, *New Histories of Science, Technology, and Medicine* (Cambridge: Harvard University Press, 2003).

<sup>25</sup>Michael E. Mann, Raymond S. Bradley, and Malcolm K. Hughes, "Global-Scale Temperature Patterns and Climate Forcing over the Past Six Centuries," *Nature* 392 (1998); P.D. Jones, T.J. Osborn, and K.R. Briffa, "The Evolution of Climate over the Last Millennium," *Science* 292 (2001).

<sup>26</sup>Thomas J. Crowley, "Causes of Climate Change over the Past 1000 Years," *Science* 289 (2000).

<sup>27</sup>Intergovernmental Panel on Climate Change (IPCC), ed., *Climate Change 2001: The Scientific Basis* (New York: Cambridge University Press, 2001); Thomas R. Karl and Kevin E. Trenberth, "Modern Global Climate Change," *Science* 302 (2003).

<sup>28</sup>The IPCC was founded in 1988 as a joint effort of the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO).

use change and increased greenhouse gas (GHG) emissions.<sup>29</sup> Releases of sequestered carbon, alterations in the capacity for carbon sequestration, changes in the reflectivity of the planet, and modifications to the composition of the atmosphere have set the global climate on a path toward potentially catastrophic alteration.<sup>30</sup> GHG emissions are considered the most pernicious of these causes, and current totals, both natural and anthropogenic, greatly exceed the limited uptake capacity of the earth's carbon cycle.<sup>31</sup>

Proxy indicators – estimates of sequestered gases in drilled ice cores, for example – detect the beginnings of increased atmospheric concentrations of GHGs in the latter half of the eighteenth century.<sup>32</sup> This, as many scholars have noted, coincides with the beginning of the industrial revolution, commonly associated with the emergence of James Watts' steam engine in 1784. Since then, industrial development has accounted for ever-increasing levels of GHG concentrations. Current emissions are at all-time highs in industrialized countries, led by energy and transportation sectors. Indeed, these anthropogenic emissions levels are unfathomable apart from their context in a technological society and illustrate incidental modification of the atmosphere.

While the phenomenon of anthropogenic climate change is generally accepted, its consequences are a matter of some scientific dispute. Many argue that the probable effects of climate change are by no means strictly harmful. Increased atmospheric concentrations of CO<sub>2</sub> and other GHGs, along with the poleward spread of temperate weather, are likely to bring such possibly beneficial effects as longer growing seasons for agriculture and decreased exposure-related mortality.<sup>33</sup> Despite such possibilities, however, the adverse effects of climate change are expected to introduce more dramatic environmental and social changes.

With a 1.7° - 4.9° C projected warming of global average surface temperatures over the next century,<sup>34</sup> anticipated consequences of climate change include sea-level rise, increased storm surge, increased intensity and frequency of hurricanes, typhoons, and tornadoes, heightened intensity of floods and droughts, and loss of biological diversity.<sup>35</sup> While the future extent of these phenomena is highly dependent upon the magnitude of global warming, some of these effects are already issuing in hard realities. Sea-level rise has already made environmental refugees of

<sup>29</sup>Intergovernmental Panel on Climate Change (IPCC), ed., *Climate Change 2001: The Scientific Basis*.

<sup>30</sup>Karl and Trenberth, "Modern Global Climate Change." K. Hasselman et al., "The Challenge of Long-Term Climate Change," *Science* 302 (2003).

<sup>31</sup>Intergovernmental Panel on Climate Change (IPCC), ed., *Climate Change 2001: The Scientific Basis*.

<sup>32</sup>Ibid.

<sup>33</sup>Ibid.

<sup>34</sup>Ibid.; T. Wigley and S. Raper, "Interpretation of High Projections for Global-Mean Warming," *Science* 293 (2001); Karl and Trenberth, "Modern Global Climate Change."

<sup>35</sup>Intergovernmental Panel on Climate Change (IPCC), ed., *Climate Change 2001: Impacts, Adaptation, and Vulnerability* (Cambridge: Cambridge University Press, 2001).

Tuvalu's citizens, residents of a small island state in the South Pacific, who are retreating from their homeland and seeking safe-haven and new citizenship in New Zealand.<sup>36</sup> Over the next 100 years, this phenomenon threatens to flood other places, including more than 10% of Bangladesh, a country densely populated with 133,000,000, largely poor people.<sup>37</sup> Due to both distribution of effects and capacity for adaptation, the consequences of climate change threaten poor populations and future generations in disproportionate measure to their GHG emissions, demonstrating the uneven geographic and temporal distribution of climate change's pernicious effects.<sup>38</sup>

### *The International Response to Climate Change*

In the face of this crisis, the international community has gathered under the auspices of the United Nations Framework Convention on Climate Change (UNFCCC) in an effort to organize their efforts toward abatement and adaptation. The highlight of the convention has been the emergence of the Kyoto Protocol – one of the most ambitious international treaties in history. Adopting a principle of shared but differentiated responsibilities, the agreement sets emissions targets for 39 industrialized nations, defined in the Protocol's "Annex B," during its first budget period, 2008 – 2012.<sup>39</sup> Other countries are exempt from emissions objectives during this initial accounting, but are likely to be assigned targets for the second period. Collective emissions reductions under the Protocol's targets would indicate a 5.2% cumulative mitigation of emissions among Annex B nations by 2010, a far cry from the IPCC's suggested global reductions of 60% from 1990 levels in order to achieve stabilization of atmospheric GHG concentrations.<sup>40</sup>

<sup>36</sup>Reuters News Service, "Tuvalu Seeks Help in U.S. Global Warming Suit," August 30 2002.; Leslie Allen, "Will Tuvalu Disappear beneath the Sea? Global Warming Threatens to Swamp a Small Island Nation," *Smithsonian*, August 2004.

<sup>37</sup>Intergovernmental Panel on Climate Change (IPCC), ed., *Climate Change 1995: The Science of Climate Change* (Cambridge: Cambridge University Press, 1996), 364. See the IS92a scenario. This conservative model assumed moderate climate sensitivity and projects business-as-usual emissions growth. A direr scenario was projected by IS92c, which assumed high climate sensitivity parameters and indicated far more catastrophic results.

<sup>38</sup>Anil Agarwal and Sunita Narain, "Global Warming in an Unequal World: A Case of Environmental Colonialism," (New Delhi: Centre of Science and Environment, 1991); Intergovernmental Panel on Climate Change (IPCC), ed., *Climate Change 2001: Impacts, Adaptation, and Vulnerability*; Anil Agarwal, Sunita Narain, and Anju Sharma, "The Global Commons and Environmental Justice - Climate Change," in *Environmental Justice: Discourses in International Political Economy*, ed. John Byrne, Leigh Glover, and Cecilia Martinez, *Energy and Environmental Policy Series* (New Brunswick, NJ: Transaction Books, 2002).

<sup>39</sup>"Kyoto Protocol to the United Nations Framework Convention on Climate Change," (1997).

<sup>40</sup>Intergovernmental Panel on Climate Change (IPCC), ed., *Climate Change 1995: The Science of Climate Change*. For updated scenarios see the emissions and concentrations "storylines" in Intergovernmental Panel on Climate Change (IPCC), ed., *Climate Change 2001: The Scientific Basis*; Intergovernmental Panel on Climate Change, "Emissions Scenarios: Special Report," ed. N Nakicenovic and R Stewart (Cambridge, UK: Cambridge University Press, 2000).

However, faced with the prospect of even minimal emissions reductions, negotiators developed the Protocol's flexibility mechanisms (emissions trading, joint implementation, and the clean development mechanism), policy devices designed to limit the necessity of domestic emissions reductions in favor of joint action. The agreement also includes carbon sinks in accounting for domestic emissions, effectively reducing the emissions reduction requirements of many Annex B nations by counting already existing forests as mitigated emissions.

These policy tools have been designated as a means to achieve economically *efficient* emissions abatement. Unfortunately, the implementation of these techniques will likely lead to emissions increases according to business-as-usual (BAU) projections rather than to abatement.<sup>41</sup> For example, after crediting forest cover as mitigated emissions, purchasing emissions credits from those few countries with targets higher than current emissions, and conducting energy development and carbon sequestration projects in Annex B and non-Annex B countries, a given country may claim to have achieved target emissions levels while actually posting emissions growth according to BAU estimates. Indeed, phantom emissions reductions such as these, applied to the accounts of Annex B countries, assure a "successful" protocol despite these likely increases – certainly a triumph of the absurd in an Ellulian sense.

While many of the flexibility mechanisms have been introduced into the Protocol under great pressure from the government of the world's largest polluter, the United States, this same government (along with those of other prominent emitters) has opted out of participation in international negotiations for the abatement of greenhouse gas emissions, choosing instead to pursue a domestic agenda of voluntary emissions abatement based upon a 'no regret' strategy.<sup>42</sup> 'No regret' policies for greenhouse gas emissions abatement seek to rectify market inefficiencies and failures in order to reduce GHG emissions or emissions intensity only when benefits exceed costs, deriving these benefits from increased market efficiency and denying any sacrificial options for abatement in rhetorical deference to the possibility that the destructive effect of climate change may not be as vicious as is projected.

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While the 1995 report suggested a 60% reduction in emissions to achieve stabilization of atmospheric concentrations at 350ppm, the 2000 and 2001 reports presents various scenarios. Notably, a 350ppm objective has been all but abandoned in favor of much higher concentration objectives – 450, 650, and 1000ppm – necessitated by historical emissions since 1995, higher forecasted emissions, and a more precise understanding of the effects of climate change upon the carbon cycle.

<sup>41</sup>John Byrne et al., "Beyond Kyoto: Reclaiming the Atmospheric Commons," in *Climate Change: Policy and Politics*, ed. Velma Grover (Enfield, NH: Science Publishers, 2004).

<sup>42</sup>David Wirth, "The Sixth Session (Part Two) and Seventh Session of the Conference of the Parties to the Framework Convention on Climate Change," *The American Journal of International Law* 96, no. 3 (2002); White House, "Executive Summary of the Bush Climate Change Initiative," (Washington, DC: 2002); White House, "Transcript of the Speech of President Bush Delivered at NOAA in Silver Spring, MD," (Washington, DC: 2002).

'No-regret' strategies play upon the marginal scientific rhetoric of uncertain causes and effects in the global climate change debate. While the scientific community cannot claim the same consensus regarding climate change as exists regarding gravity, for example, the evidence for dramatic changes in climate and some level of human contribution to the problem is more overwhelming now than ever. Nevertheless, climate change skeptics continue to deploy the rhetoric of uncertainty as partial justification for 'no regret' strategies.

Despite failure to achieve its stated goals and to compel the participation of key GHG emitters, the Kyoto Protocol has been hailed by some as a success for the international policy community.<sup>43</sup> While this may be a questionable level of enthusiasm for the possibility of actual emissions reductions under this particular regime, the Protocol is certainly a "successful" example of purposed intervention into the biospheric processes that govern climate. The international climate regime is intentionally determining desirable levels of atmospheric modification and climate change to be achieved by technical (both material and non-material) means.

The reasoning behind a successful appraisal of the Kyoto Protocol would be no more surprising to Ellul than the artifice it reflects. In a technological society, the success of the Protocol is not predicated upon its achieving a desired end, but rather upon its proliferation of technical means. As Ellul suggests, "it is not truly an end that is sought, but only an application of a means.... We live within an amalgam of means that no longer have any other meaning than to escalate and that tend to eliminate everything outside of themselves."<sup>44</sup> Even those countries that abstain from participation in the Protocol do so out of deference to technique; participation would be inefficient.

The problems of anthropogenic climate change and the international policy response to the social and ecological crises threatened by the phenomenon are clearly inconceivable prior to the advent of industrial society. Technical developments in productive sectors make possible the emission of greenhouse gases at levels that would have been impossible prior to the industrial revolution. Developments in the field of economic technique have made "virtual carbon reductions"<sup>45</sup> almost certain under the Kyoto Protocol through the implementation of market mechanisms for the achievement of efficient management of atmospheric GHG concen-

<sup>43</sup>See, for example, Jon Hovi, Tora Skodvin, and Steinar Andresen, "The Persistence of the Kyoto Protocol: Why Other Annex I Countries Move on without the United States," *Global Environmental Politics* 3:4 (2003); Michael Grubb, Christiaan Vrolijk, and Duncan Brack, *The Kyoto Protocol - a Guide and Assessment* (Earthscan Publications Ltd, 1999).

<sup>44</sup>Jacques Ellul, "Political Realism (Problems of Civilization III)," *Sources and Trajectories: Eight Early Articles by Jacques Ellul That Set the Stage*, ed. Marva Dawn (Grand Rapids, MI: Wm. B. Eerdmans Publishing Co, 1997), 61.

<sup>45</sup>John Byrne and Leigh Glover, *Climate Shopping: Putting the Atmosphere up for Sale, Tela: Environment, Economy, and Society Series* (Melbourne, Australia: Australian Conservation Foundation, 2000); John Byrne et al., "The Postmodern Greenhouse: Creating Virtual Carbon Reductions from Business-as-Usual Energy Politics," *Bulletin of Science, Technology, and Society* 21:6 (2001).

trations.

Finally, the unilateral environmental policies pursued by the United States, Australia, and others also reflect technical origins. 'No-regret' strategies value, above all, a commitment to economic efficiency. Like the market-based flexibility mechanisms of the Protocol itself, a 'no-regret' strategy pursues only the most efficient means of emissions reductions. Even re-entry into the Protocol would be predicated upon efficiency. Some have indicated that the United States will likely soon sign the treaty, and the consensus rationale is thought to be the economic inefficiency of exclusion from the carbon trading market during the early years of the first commitment period, which would prevent the US from taking advantage of "low-lying fruit" in the purchase of cheap emissions credits.<sup>46</sup>

### Climate Change and Climate Change Policy as Human Sacrifice

Climate change reflects the growing artifice of contemporary civilization, and while Ellul found this aspect of the technical milieu plain, he considered another important facet of technological society considerably less obvious and devoted an entire book, *The New Demons*, to technique's capacity as a sacred element in the organization of contemporary society.<sup>47</sup> Again, an infelicitous translation of the title is somewhat misleading. *The Newly Possessed* might be a more revealing rendition, intimating technique's indwelling facility. In other words, technique serves both as milieu and as idol.

Ellul began his analysis of this characteristic with an interpretation of modern society's supposed "'irreligious' condition."<sup>48</sup> "A current commonplace," he wrote,

is that the modern world is secular, secularized, atheistic, laicized, desacralized, and demythologized.... [I]t obeys reason and rejects beliefs, especially religious beliefs; it has got rid of God the Father and all gods, and if you talk to it of religion it won't understand you. It has adopted a new way of thinking worlds apart from the traditional way of thinking that found expression in myths. It cannot understand the language of transcendence and can live only at the level of concrete reality. The day of religion is over.<sup>49</sup>

Ellul found this commonplace lacking, however, judging it to be inadequately examined and steeped in naïveté. A careful analysis yields "phenomena not expressly called religion or myth but fulfilling exactly the same function."<sup>50</sup> "The substantial reality," he noted, "is identical."<sup>51</sup>

In an earlier exposition of these idolatrous tendencies, Ellul emphasized the emergence of the sacred from the everyday elements of society:

<sup>46</sup>Bertrand Hamaide, "'Economic' and 'Political' Cooperation in Various Climate Policy Scenarios," *Climate Policy* 3 (2003).

<sup>47</sup>Jacques Ellul, *The New Demons* (New York: Seabury Press, 1973).

<sup>48</sup>*Ibid.*, viii.

<sup>49</sup>*Ibid.*, 18.

<sup>50</sup>*Ibid.*, 47.

<sup>51</sup>*Ibid.*, 47.

We live in a world that, to the same extent that it more and more rejects the Christian faith, also fabricates for itself more and more idols, let's say, or myths, or false values. In the absence of true religions, we respond by creating values adapted to our religious need. And then the simple facts are transformed into religious values. For example, the state will be easily transformed into a religious value – or the nation, or progress, or work, or, in certain countries, socialism is transformed into a religious value. In other words, facts that, when they are nothing but facts, are perfectly acceptable, perfectly normal, become threatening and dangerous at the point where they are invested with sacral value.<sup>52</sup>

Among the phenomena identified by Ellul is technique, which, as sacred, organizes human social relations as well as human relations with the non-human creation, delimiting both thought and action.<sup>53</sup> "Thanks to the sacred," he wrote,

[man] can be oriented in the world and know where and how to act.... It is always a matter of knowing what it is possible to do, and sometimes how and where to do it. From then on, the sacred defines a certain order of action, for it is precisely that action which cannot be carried out thoughtlessly. It is appointed in a given space. The sacred is an organization of action in a space, and at the same time it is the geography of that space in which the action can be undertaken.<sup>54</sup>

It is in this organizing capacity, as much as through its characteristic artifice, that technique constructs the problem of climate change.

While a preoccupation with technique is a principal cause of climate change, itself, it is also a fundamental element of the international response. As Wesley Granberg-Michaelson suggests, "Our culture adheres to a blind faith in technological progress as the means to resolve environmental problems and the maldistribution of world resources;"<sup>55</sup> the Kyoto Protocol is no exception. The international regime of climate management issues from a commitment to technique in which efficiency is confessed as the hope for future, the means of renewal.

This exaltation of technique is plainly idolatrous. As Ellul wrote,

Technique is what it is. Administration, as a thing, is fine. The machine, as a thing, is fine. But as soon as people put their faith in this machine, place all their hope in this machine, are convinced that their spiritual life depends on this machine and that actually the machine will be the vicarious instrument which will allow them cheaply to exercise love of neighbor, then at that moment we are in full idolatry.<sup>56</sup>

In the purposed intervention of environmental management evidenced in the Kyoto Protocol, technique has become the means by which international society proposes to exercise love of neighbor in the face of an environmental crisis that already claims

<sup>52</sup>Jacques Ellul, "Christian Faith and Social Reality," *Sources and Trajectories: Eight Early Articles by Jacques Ellul That Set the Stage*, ed. Marva Dawn (Grand Rapids, MI: Wm. B. Eerdmans Publishing Co, 1997), 176.

<sup>53</sup>Ellul, *The New Demons*, 50.

<sup>54</sup>*Ibid.*, 51 - 52.

<sup>55</sup>Wesley Granberg-Michaelson, *Ecology and Life: Accepting Our Environmental Responsibility* (Waco, TX: Word Press, 1988), 37.

<sup>56</sup>Ellul, "Christian Faith," 177.

the lives of more than 150,000 people every year, a tragedy faced by a population consisting largely of poor children in Africa, Asia, and Latin America.<sup>57</sup> Even at this level, climate change may seem a less significant – and less tractable – cause of human suffering than many others. For example, vitamin and mineral deficiencies claim millions of lives every year. Nevertheless, while these other causes of human suffering warrant serious consideration and direct action, climate change-related mortality represents a practice of human sacrifice inherent in the organization of technological society.

As Ellul observed, “What is tragic is that once a thing has been transformed into a divinity, technique for example, we are ready to sacrifice persons to it. All the gods, we know from human history, have demanded human sacrifice. With Technique, with the State, with the Fatherland, that continues.”<sup>58</sup> While Israel was prohibited from offering its children as burnt sacrifices to Molech, our technological society stands ready to offer our neighbors, children, grandchildren, and God’s good creation as burnt sacrifices to Mammon in the fiery furnace of earth’s future climate.

In pursuing either market-based flexibility mechanisms or ‘no regret’ strategies in response to the prospects for climate change, we trust in technique (efficiency) for the resolution of potential social and environmental evils. In opting for no-cost and low-cost approaches, we imply that the market will efficiently distrib-

<sup>57</sup>World Health Organization (WHO), “World Health Report 2002: Reducing Risks, Promoting Healthy Life,” (Geneva: World Health Organization, 2002), 71 - 72. Causes of death examined included diarrhoeal diseases, malaria, malnutrition, heat and cold, and floods. See also World Health Organization (WHO), ed., *Climate Change and Human Health - Risks and Responses* (Geneva: World Health Organization, 2003). For a discussion of research methods used in the WHO estimations, please see A.J. McMichael et al., “Climate Change: Comparative Quantification of Health Risks: Global and Regional Burden of Disease Due to Selected Major Risk Factors,” (Geneva: World Health Organization Evidence and Information for Policy Group, 2003). For a more circumscribed approach, see D.H. Campbell-Lendrum, C.F. Corvalan, and A. Pruss-Ustun, “How Much Disease Could Climate Change Cause?” *Climate Change and Human Health: Risks and Responses*, ed. A.J. McMichael, et al. (Geneva: World Health Organization, 2003); P. Martens et al., “Climate Change and Future Populations at Risk of Malaria,” *Global Environmental Change - Human and Policy Dimensions* 9 (1999). For a contrarian position, see Robert E. Davis et al., “Seasonality of Climate-Human Mortality Relationships in US Cities and Impacts of Climate Change,” *Climate Research* 26 (2004). This recent article has received much publicity for its very low estimates of projected marginal mortality increases in US cities due to increased heat. In fact, the authors note that marginal increases in mortality during summer heat waves may be offset by marginal decreases in exposure-related mortality during the winter months. It must be noted, however, that the authors examined only the effects of increased heat in US cities, where air conditioning is ubiquitous. Indeed, the authors themselves attribute the small increase to air conditioning, noting the possible toll of energy taxes upon European communities in the face of rising temperatures. The authors do not, however, attend to the relationship between energy use and climate change. Nor do they address the effects of extreme heat in less affluent communities, other examples of extreme weather (i.e., increased frequency and intensity of hurricanes and typhoons), or other warming-related phenomena, such as sea level rise.

<sup>58</sup>Ellul, “Christian Faith,” 177.

ute globally any social and environmental ills. We rely, in this instance, upon technique "as the vicarious instrument which will allow [us] cheaply to exercise love of neighbor"<sup>59</sup> in our marginal efforts at reducing emissions: cheaply, in that we elude the prospect of tangible and immediate obligation to sacrifice. It is not a costly way to love other populations throughout the world, or future generations, or creation. For efficiency's sake, they are discounted, in every sense of the word. As Ellul suggested, "Efficiency is a fact and justice a slogan."<sup>60</sup>

## Conclusion

An obsession with efficiency manifest in the origins of climate change and climate change policy engenders not only a preoccupation with means to the exclusion of ends, but also a fixation upon solutions to the exclusion of problems. Ellul writes of the dangerous tendency to prioritize the solution over the problem: "This is the folly of our time: we claim to give solutions without even looking at the problems. We cast a superficial glance over the world and pretend to organize it for a thousand years. It is not one of the least contradictory traits of our epoch that we demand answers before we are capable of formulating clearly the questions."<sup>61</sup> Elsewhere Ellul elaborates on this point:

Solutions to what? That is one of the most suggestive surprises there might be.... Nobody is concerned to know the problem. One begins with the very general and vague idea: 'it's not working.' What? Everything: the economic, the political, and social. More precisely? Unimportant. Vain analyses, mind games. What is needed is a remedy, and that right away.... Now these problems are all, without exception, wrongly posed because... they are conceived as causes when they are only effects.... The problem is posed well enough in reality, in the practical life, but it is not formulated, it is not intellectually, analytically conceived. Now it is impossible to answer a question when the question is not thus posed.<sup>62</sup>

This Ellulian rationale would justify an almost-exclusive concern for problemizing climate change from a Christian perspective, especially given the church's general lack of attention to environmental issues and the social relations mediated by them. Nevertheless, the problem is so grave as to command a reformulation of Christian political ethics of the environment. In conclusion, I offer a modest contribution to this end, focused on the principles of stewardship, justice, and freedom.

<sup>59</sup>Ibid.,177.

<sup>60</sup>Ellul, *The Technological Society*, 282.

<sup>61</sup>Jacques Ellul, "Chronicle of the Problems of Civilization: 1. By Way of a Brief Preface," *Sources and Trajectories: Eight Early Articles by Jacques Ellul That Set the Stage*, ed. Marva Dawn (Grand Rapids, MI: W.B. Eerdmans Publishing Co, 1997), 20.

<sup>62</sup>Jacques Ellul, "Needed: A New Karl Marx! (Problems of Civilization II)," *Sources and Trajectories: Eight Early Articles by Jacques Ellul That Set the Stage*, ed. Marva Dawn (Grand Rapids, MI: W.B. Eerdmans Publishing Co, 1997), 36.

The most carefully and robustly articulated of these three virtues is stewardship, which enjoys considerable attention in Christian environmental scholarship.<sup>63</sup> Indeed, a discernible current of “creation care” may be distinguished in both classical and contemporary literature. Nevertheless, while an evangelical ethic of earth-keeping is a thoroughly-examined concept, it suffers a lack of application to particular environmental issues, including climate change.

With climate change, we come to a new understanding of stewardship’s scope. So often reduced to a simple application of resource management, stewardship is considerably more than the promotion of sustainable exploitation of nature. The problem of climate change exposes stewardship as a corporate project of promoting ecological integrity.

### Justice

While Christian scholarship has made a considerable contribution to the development of a discourse of stewardship, it has given relatively little attention to the matter of environmental justice. Of course, significant theological resources have been brought to bear upon the question of social justice, but this excellent work seems very seldom translated into a Christian interpretation of environmental crises. Kenneth Petersen writes,

As with our understanding of stewardship, we have tended to construe justice too narrowly. We correctly perceive that justice involves right relationships among people and between God and people. But we seldom include the non-human creation in this concept even though Scripture makes plain that God’s justice encompasses all of the creation.<sup>64</sup>

Perhaps this is indicative of the church’s struggle with a nature/culture dualism. As Steven Bouma-Prediger writes, “The emphasis within the Christian tradition on dualisms... denigrates the earth and sanctions its misuse and exploitation.”<sup>65</sup> This emphasis quite possibly also accounts for the difficulty with which the church engages social relations mediated by ecological conditions.

<sup>63</sup>For an excellent treatise on Christian environmentalism, see Steven Bouma-Prediger, *For the Beauty of the Earth: A Christian Vision for Creation Care*, eds. William A. Dyrness and Robert K. Johnston, *Engaging Culture* (Grand Rapids, MI: Baker Academic, 2001). See also Fred Van Dyke, David C. Mahan, Joseph K. Sheldon, and Raymond H. Brand, *Redeeming Creation: The Biblical Basis for Environmental Stewardship* (Downers Grove, IL: InterVarsity Press, 1996); Calvin B. DeWitt, *Caring for Creation: Responsible Stewardship of God’s Handiwork* (Grand Rapids, MI: Baker Publishing Group, 1998).

<sup>64</sup>Kenneth L. Petersen, “The Educational Imperative of Creation Care,” *Christian Scholar’s Review* XXXII:4 (2003): 449.

<sup>65</sup>Bouma-Prediger, *For the Beauty of the Earth*, 71. For a more thorough treatment of dualism, particularly matter/spirit and nature/history, see also Steven Bouma-Prediger, *The Greening of Theology: The Ecological Models of Rosemary Radford Ruether, Joseph Sittler, and Jurgen Moltmann* (Atlanta, GA: Scholars Press, 1995).

Despite this obstacle, the injustices of climate change and climate change policy call for a robust articulation of ecological justice, demanding ethical consideration of both human and non-human nature, as well as future generations.<sup>66</sup> Bouma-Prediger interprets this theme through the “theological motif of righteousness,” writing, “Of particular concern are those most likely to be treated unjustly, namely, the voiceless, the powerless, the homeless. And while this concern is appropriately and most often directed toward humans, it also includes those non-human creatures whose voices remain silent to human ears.”<sup>67</sup> Climate change presents an opportunity to articulate a more robust vision of justice that considers both environmentally mediated human conditions and ecological integrity, as well as the social relations to which it is unfortunately so often limited.

### *Freedom*

No doubt the greatest barrier to stewardship and justice is bondage to idols such as technique. In the face of this condition, Christians must take upon themselves the tasks of profaning the contemporary idols to which we are willing to make such sacrifices and of desacralizing those systems by which we propose to vicariously and cheaply love our neighbors. As Bouma-Prediger writes, “We must renounce the idols to which we have pledged our allegiance – the false gods of scientism, technicalism, and materialism, among others....”<sup>68</sup> Ellul writes, “Christians have an enormous service to render to humankind in smashing these idols.... This kind of profanation... must be done not only in words, not in doctrines and in theories, but must also penetrate practice.”<sup>69</sup>

Rather than excusing ourselves on account of uncertainty, we should see the prospect of global climate change as the opportunity to articulate both ethics and politics consistent with the principles of justice, stewardship, and freedom from the bondages to idols that enslave us. This is a high calling and a difficult task. The thought alone is costly, and the practice more so. But our God, too, demands human sacrifice. He demanded it of his Son, our Lord, and he demands that we present ourselves as living sacrifices, even as we participate in the groaning of creation.<sup>70</sup> Our faith in this God must issue in a praxis that articulates, in word and deed, a love for Him and neighbor, and respect for His creation.<sup>71</sup>

<sup>66</sup>Extending the boundaries of the ethically considerable, ecological justice is concerned with the production, valuation, and distribution of environments. The landmark text regarding ecological justice is widely considered to be Nicholas Low and Brendan Gleeson, *Justice, Society, and Nature: An Exploration of Political Ecology* (New York: Routledge, 1998).

<sup>67</sup>Bouma-Prediger, *For the Beauty of the Earth*, 157.

<sup>68</sup>*Ibid.*, 157.

<sup>69</sup>Ellul, “Christian Faith,” 176.

<sup>70</sup>Romans 12:1 and 8:18-25.

<sup>71</sup>I would like to thank four anonymous reviewers for helpful comments on earlier drafts of this article.