



# CONSUMPTION, POPULATION, — AND — SUSTAINABILITY



**Perspectives from  
Science and Religion**

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**Edited by Audrey R. Chapman,  
Rodney L. Petersen, and Barbara Smith-Moran**

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## *Preface*

The question of global sustainability is one that has begun to absorb the attention and efforts of a number of different communities of scholars and policy personnel over the last quarter century. Consumption levels and issues of population policy directly affect the sustainability equation. Yet both are fraught with deep public policy implications that draw upon two communities that are at times seen to be at odds with one another, the “religious” and the “science” communities, each with its own conversations and social activists.

This volume—and the larger conference and work of which it is a part—attempts to draw these groups into conversation with one another. Therefore, it is appropriate that the book be developed by a scientific organization of such stature as the American Association for the Advancement of Science (AAAS) in collaboration with the Boston Theological Institute (BTI), the association of university divinity schools, schools of theology, and seminaries in the Greater Boston area. Since the inception of this volume, an increasing number of models have been put forward to promote a science–religion dialogue. Much of the credit for this goes to the AAAS and to conversations and studies people associated with AAAS have stimulated. However, if conversation is to proceed, it is clear that there needs to be an adequate understanding of the fundamentals of modern science and its methodology. This must be matched by an informed ethics developed in relation to the contemporary sciences, as well as an understanding of specific issues under consideration. Finally, new methodologies and approaches are needed to delineate proper integration. The authors of this volume argue for the importance of a broad interdisciplinary approach that draws together the concepts raised in the title, which are consumption, population, and sustainability. Short-term environmental policy fails to take into account the economic and moral burdens

being placed on future generations through the present depletion of resources.

The manner by which religion, or values independent from the natural sciences, might be integrated is complex. From one point of view, it requires a worldview that is not that of scientism, although it may be scientific. The field of religious studies is one that is deeply divided between those for whom religion is an area of human engagement subject to natural and mechanistic explanation and others for whom such an unreservedly naturalistic approach begs the very premises of religious understanding. Division in the field of anthropology between those who wish to maintain the aloofness of the social sciences from the natural sciences offers insight here. Although the enormity of these debates is only touched on in this book the subject needs to be raised at the outset.

The point raised at mid-century by Nels F. S. Ferré—that the sciences have inadvertently contributed to a collapse of values by fostering a spirit of negativity, detachment, and tentativeness—applies in a special way to the kinds of engaged activity required for environmental sustainability in the twenty-first century.<sup>1</sup> This critique, applied specifically to the emergence of scientific positivism, is one that is challenged today by scholars and policy personnel concerned about and committed to environmental justice and health. A similar concern with respect to technology was developed by the sociologist Jacques Ellul: “Technique is the translation into action of man’s concern to master things by means of reason, to account for what is subconscious, make quantitative what is qualitative, make clear and precise the outlines of nature, take hold of chaos and put order into it.”<sup>2</sup> This mentality has become, for Ellul, the reigning mythology of our epoch. Finally, Paul Ehrlich offers the opinion that “a quasi-religious movement, one concerned with the need to change the values that now govern much of human activity, is essential to the persistence of our civilization.”<sup>3</sup>

Whether Ferré’s concern for the sciences, Ellul’s focus on technology, or Ehrlich’s apprehension toward our environmental future, all three score negatively in the creation of a value-detached objectivity. Together, their concerns promote a science–religion dialogue with the aim of an informed and engaged morality.

Many people have contributed to this book. Thanks goes first to the Aspen Institute and the Pew Charitable Trusts for a grant given to enable a working conference to occur, jointly sponsored by the American Association for the Advancement of Science and the Boston Theological Institute. The conference, entitled “Consumption, Population, and the Environment: Religion and Science Envision Equity for an

Altered Creation," was held November 9–11, 1995. In addition to this volume, the conference facilitated the development of a video, "Living in Nature: Religion and Science in Dialogue on the Environment," a course taught at Andover Newton Theological School, and numerous eddies of conversation and study both in the Boston area and beyond.

In addition to the work of those cited as editors of and contributors to this volume, a special word of thanks goes to Adam Kissel and Forrest Clingerman, successive office operations managers of the Boston Theological Institute, and to Aaron Goldberg from the office of the Program for Science and Religion of the American Association for the Advancement of Science. Rev. Barbara Smith-Moran, E. Kay Bergersen, and Susan Youmans worked extensively with Dr. John Michalczyk, chair of the Fine Arts Department and professor of film studies of Boston College, to produce the video. Colleagues and students associated with the Religion and Ecology Program of the schools of the Boston Theological Institute helped with the conference and, at various stages along the way, with programming that helped to make ongoing work from the conference possible. Special mention goes to William Jones of Andover Newton Theological School; Jonna Higgins, Amy Langston, and Dennis Hargiss of Harvard Divinity School; Amelia Smith of Episcopal Divinity School; and Alexander Kern of Andover Newton Theological School for proofreading assistance. Finally, thanks goes to Dr. Timothy Weiskel, director of the Harvard Seminar on Environmental Values at the Harvard Divinity School. Dr. Weiskel's continued efforts throughout the Harvard University community have helped to keep alive a topic of such philosophical, religious, and ethical import as that of environmental studies.

—Rodney L. Petersen

## Notes

1. "The Immortality of Science," *Religion in Life* 10, no. 1 (Winter 1941): 31–40.
2. See his study, *The Technological Society* (New York: Alfred A. Knopf, 1964), p. 43.
3. *The Machinery of Nature* (New York: Simon & Schuster, 1986), p. 17.

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# Science, Religion, and the Environment

Audrey R. Chapman\*

The creation narratives in the book of Genesis provide images of an ideal landscape that anticipates a balanced and interdependent ecosystem. According to the biblical writers, God brings forth living creatures of every kind, blessing them and telling them to be fruitful and multiply. At the apex of the creation process, the first man and woman are placed in the Garden of Eden to till and keep it. The primordial couple are given one restriction, not to eat of the tree of knowledge of good and evil, but of course they violate this mandate. When they do, they suffer the penalty of banishment. They are driven out of the garden to face the realities of the outside world.

Suppose that the narrative turned out differently, that Adam and Eve were forgiven and allowed to remain in the garden. What might the outcome have been? Beginning the task of procreation, the first couple would soon have had a family. Their children and the countless generations following them would likely have taken God's blessing to be fruitful and multiply quite literally, as would the other species. This process of fruitful procreation would have set up a competition between the human family and otherkind for resources and space. Humans, having eaten of the tree of knowledge, might have tried to resolve the ensuing problems through the ingenious introduction of technology. Over the long term, however, their technology is likely to have been intrusive and affected the ecological balance. Eventually, the

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entire environmental system in the garden probably would have been threatened. Instead of banishment to the realities of an often harsh world outside the garden, humans would have undermined their paradise and turned it into a polluted and depleted landscape.

And that is our current situation. The growth in human population from five million people at the dawn of the agricultural revolution to six billion people at the close of the twentieth century has transformed ecosystems and contributed to an environmental crisis that threatens the planet. As ethicist James Nash comments, the biblical injunction to "increase and multiply" may be the only one that humankind has fully obeyed.<sup>1</sup> All other things being equal, a significantly smaller human population, five million people or even one billion, would have had considerably less impact on the environment than the current toll of six billion. If the planet's population had stabilized at even half of our current numbers, it is unlikely that there would be falling water tables, deforestation, or the extinction of thousands of species each year.<sup>2</sup> But of course, not all things are equal. Not only has the human population grown exponentially, but also changing lifestyles and rising consumption patterns have resulted in ever more environmentally damaging technologies. Modern technologies that have been developed to support affluent consumption patterns—even more than increasing numbers—have resulted in such environmental hazards as ozone holes and the possibility of human-induced climate change. This finite planet is being seriously taxed by modern industrial technologies that extract resources and pollute the earth at rates that would have been unimaginable in earlier periods.

What are the implications? As theologian Daniel Maguire starkly summarizes the situation, "If current trends continue, we will not. And that is qualitatively and epochally new."<sup>3</sup> As the twentieth century is coming to an end, many scientists believe that the cumulative impact of human activity is pushing to the limit the earth's life-supporting or carrying capacity, perhaps even exceeding it. Our Eden is being threatened, but there is no place to go.

This volume is an outgrowth of "Consumption, Population and the Environment: Religion and Science Envision Equity for an Altered Creation" a conference cosponsored by the Boston Theological Institute and the American Association for the Advancement of Science. Held in November 1995 in Weston, Massachusetts, the conference brought together more than 250 scientists and people of religious faith to discuss scientific and religious perspectives regarding the impact of consumption patterns and population trends on the environment; to envision alternative and more equitable value systems, economic

arrangements, and technologies; and to consider the potential contributions of religious communities to developing a more sustainable future. The focus of the conference and this volume raise two questions: First, why have a dialogue between the scientific and religious communities relating to the environment, and, second, why should such a dialogue focus on the issues of consumption and population?

## Relationship between Science and Religion

The philosopher Alfred North Whitehead once described science and religion as “the two strongest general forces (apart from the mere impulses of the various senses) which influence men.”<sup>4</sup> Taking up this theme, a World Council of Churches publication titled *Faith, Science and the Future* characterizes faith and science as two human ventures: “One meets the world with an inquiring intelligence. It values accurate, testable knowledge. It experiences the sheer joy of knowing, of understanding the world, of making discoveries and the power of prediction and control.”<sup>5</sup> This, of course, is the venture of science and technology, but, as the authors remind us, in some ways science is also a venture of faith, faith in the ultimate rationality and knowability of the world. Religious faith, in contrast, “meets the world in wonder, trust and commitment. It values the relations of persons to each other and to their ultimate source and destiny. It glories in the beauty of holiness and the responsibility of service.”<sup>6</sup> And it might be added that religious faith also pursues truth and understanding—however, with different methodologies and approaches than science does. Although both science and religion are essential to human understanding, their relationship has sometimes been problematic.

The relationship between the two ventures has frequently been portrayed as one of warfare, and various historical instances of conflict are well known. The Vatican’s condemnation of Galileo for accepting the Copernican view of a heliocentric (sun-centered) universe is often cited as one example. The decision to burn at the stake Giordano Bruno, a sixteenth-century astronomer and philosopher, because of the tenacity with which he maintained his unorthodox ideas of an infinite universe and a multiplicity of worlds also constitutes part of the litany of the supposed incompatibility of religious and scientific principles. A third example is that of the 1925 Scopes trial, in which it was argued that the teaching of evolution in the schools should be forbidden because it is contrary to scripture.

However, the conflict model simplifies and distorts a complex historical relationship. Historians remind us that modern empirical west-

ern science “was cast in a matrix of Christian theology. The dynamism of religious devotion, shaped by the Judeo-Christian dogma of creation, gave it impetus.”<sup>7</sup> According to Lynn White, by the early thirteenth century in the Latin West, natural theology was moving away from a focus on decoding the physical symbols of God’s communication with humanity and was making more of an effort to understand God’s mind by discovering how the creation operates. Up to and including Leibnitz and Galileo, scientists typically explained their motivation in religious terms. Not until the late eighteenth century did scientists secularize their vocations.<sup>8</sup>

Even in the post-Enlightenment period, it can be argued that autonomy rather than conflict was more often the dominant theme in the relationship between science and religion. After all, the dynamic of secularization over the centuries was to push religion from the public to the private sphere and to emphasize the contrast between faith and reason. Many writers in the history of Western thought have dealt with the epistemological dichotomy between religious and scientific knowledge, each of which is said to have its own distinctive domain and methods. The prevailing metaphysical dualism of spirit and matter further reinforced the independence and mutual autonomy of the two fields. Langdon Gilkey’s testimony at a 1982 trial provides a contemporary expression of this view. The trial contested an Arkansas law requiring the teaching of “creationist theory,” that there is scientific evidence for so-called scriptural claims that the world was created within the last few thousand years, as scientific theory in high school biology classes. Gilkey, who is a theologian, makes the following distinctions: science asks objective *how* questions, while religion asks *why* questions about meaning and purpose in the world and about our origin and ultimate destiny. Science seeks to explain objective, public, repeatable data; religion is concerned with the existence of order and beauty in the world and the experiences of our inner life. Logical coherence and experimental adequacy provide the basis of authority in science; the divine is the final authority for religion, and revelation through God’s human agents constitutes the medium of enlightenment and insight. Science makes quantitative predictions that can be tested experimentally; religion uses symbolic and analogical language.<sup>9</sup>

Rather than ongoing warfare, conflicts between science and religion have been sporadic, usually occasioned by scientific discoveries that threaten religious dogma. With the exception of the relatively small group of biblical literalists, most modern religionists, at least in the West, have repented of the famous, or perhaps infamous, efforts to suppress scientific findings. In 1984, a Vatican commission acknowledged

that "church officials had erred in condemning Galileo" in the seventeenth century.<sup>10</sup> In 1988, Pope John Paul II issued a statement in which he underscored the importance of the search for "areas of common ground" between the fields of religion and science. According to the pope, "It is crucial that this common search based on critical openness and interchange should not only continue but also grow and deepen in its quality and scope. For the impact [that science and religion have] and will continue to have, on the course of civilization and on the world itself, cannot be overestimated, and there is so much that each can offer the other."<sup>11</sup> While critical of scientism, the philosophical notion that does not admit the validity of forms of knowledge other than those of the sciences, the pope's recent encyclical letter *Fides et Ratio* conveys his admiration for scientific achievements and offers "encouragement to these brave pioneers of scientific research, to whom humanity owes so much of its current development." He urges scientists "to continue their efforts without ever abandoning the sapiential horizon within which scientific and technological achievements are wedded to the philosophical and ethical values which are the distinctive and indelible mark of the human person."<sup>12</sup>

One dimension of an effort at rapprochement is the religious community's growing interest in science. Efforts to better understand the implications for theology of scientific methodologies and discoveries are manifested on an academic level in course offerings, research, and literature addressing various aspects of "theology for a scientific age."<sup>13</sup> Theologians from many different faith traditions have begun to explore the implications of modern science for understanding the nature and purpose of the creation. Several academic programs and centers have been established, one of which, the Faith and Science Exchange at the Boston Theological Institute, played a major role in the cosponsorship of the conference that provided the basis for this volume. Religious ethicists, and in some cases faith communities, have also sought to address ethical and policy issues related to the impact of science on society. On the other side of the divide, scientists in some fields, particularly physics, cosmology, and astronomy, have begun to consider issues related to the origins, nature, and ultimate destiny of the universe, which are traditionally within the religious domain.

These developments raise a question as to how the religious and scientific communities can develop more meaningful and constructive relationships. In his landmark volume, *Religion in an Age of Science*, Ian Barbour identifies four options for the relationship between science and religion: conflict (the "warfare" model), independence (which assumes that the methodologies and subject areas of religion and sci-

ence are unrelated to one another), dialogue (the effort to explore boundary questions), and integration (approaches to developing a comprehensive metaphysics or coherent worldview based on science and religion).<sup>14</sup> Likewise, John Haught's book *Science & Religion: From Conflict to Conversation* offers four typologies: conflict, contrast, contact, and confirmation, the first three of which are similar to Barbour's options. Haught's fourth category, confirmation, expresses his belief that religion ultimately inspires and facilitates scientific discovery by setting the framework for a rational and orderly universe.<sup>15</sup>

There are several other complex and nuanced typologies. Ted Peters outlines eight models of interaction: (1) scientism (the belief that science offers the only path to knowledge); (2) scientific imperialism (which claims that knowledge of the divine comes from scientific research rather than religious revelation); (3) ecclesiastical authoritarianism (religious censorship of science); (4) scientific creationism (the use of pseudo-science to claim that biblical accounts of creation are fully scientific); (5) the two-language theory (which distinguishes between the language of fact and the language of values); (6) hypothetical consonance (which looks for areas in which there is a correspondence between science and religion); (7) ethical overlap (which addresses challenges created by science and technology); and (8) new age spirituality (which integrates spirituality with physical theory).<sup>16</sup> Philip Hefner's survey of contemporary thinking on the religion–science interface offers six trajectories: (1) the Christian evangelical option (which reaffirms the rationality of traditional belief); (2) the modern option (which translates traditional religious wisdom into scientific concepts); (3) the constructivist traditional option (which interprets science by means of traditional theological concepts that have themselves been reinterpreted in light of scientific findings); (4) the postmodern–new age option (which constructs new science-based myths); (5) the critical post-Enlightenment option (which expresses the truth at the “obscure margin” between what we know through science and the transcendent reality that we seek to know); and (6) the postmodern constructivist option (which fashions a new meta-physical loom on which scientific knowledge can be woven).<sup>17</sup>

Media reports notwithstanding, few mainstream religious thinkers currently believe that there are intrinsic conflicts between contemporary science and classical Western religious teachings. The major and sometimes very vocal exceptions within the religious community are fundamentalists and scriptural literalists who believe that every word and passage in the Bible are literally true and must be considered to be scientifically factual. So-called creation scientists, or creationists, who purport to prove the scientific basis of biblical accounts of the creation and

disprove scientific theories of evolution are a subgroup within the "conflict" constituency. Scientific skeptics who assume that modern science disproves religious belief in a purposeful universe created by a benevolent God constitute another subcommunity. Some scientists make the epistemological claim that science and scientific methods offer the only reliable guide to truth. Others go beyond an epistemological scientism to assert that physical matter is the only or fundamental reality in the universe.<sup>18</sup> Barbour and Haught argue that earlier conflicts between the religious and scientific communities, as well as current attitudes of religious fundamentalists and scientific skeptics, result from mistakenly conflating or confusing the appropriate methodologies and subject matter of science and religion.<sup>19</sup>

Recently, some religious thinkers and scientists have sought opportunities for constructive dialogue and mutual enrichment between the two disciplines. This reaching beyond the independence and autonomy of science and religion sometimes reflects the desire to explore boundary questions, such as the relationship between Judeo-Christian religion and the development of modern science.<sup>20</sup> Other times it advocates greater contact, anticipating that scientific knowledge can broaden the horizons of religious faith, while the perspective of religious faith can contribute to a fuller understanding of the universe.<sup>21</sup> Discovery of unanswered questions or issues that lie outside the competence of one's field can serve as a stimulus. Relevant examples are genetic scientists' realization that their research raises ethical dilemmas and fundamental questions as to what it means to be human, and theologians' interest in the implications of contemporary physics and cosmology for understanding the nature and destiny of the universe. There are also instances in which scientists and/or religious leaders, confronting serious problems or issues that affect the future of their country or the planet, determine that political cooperation between the communities can enhance prospects for a satisfactory resolution.

Despite the interests of individual scientists, the scientific community has generally been reticent about cross-disciplinary initiatives and interface between the fields. Assumptions not only that science and religion have different epistemologies and methodologies, but also that the scientific approach has greater value or truth, constitute a major barrier. It should be noted that the willingness of scientists to collaborate with religious leaders, even in some instances in which the scientific community has taken the initiative, does not necessarily mean that scientists respect their views. John Haught, a theologian who was a participant in the meeting that drafted the statement discussed later in this essay entitled "Joint Appeal by Science and Religion on the Environment,"

notes the anomaly of three prominent scientists, well known for their positions that religions are essentially illusory, appealing to the religious leaders present to foster the moral inspiration needed to protect the environment. Haught questions whether it is intellectually honest for these scientists to attempt to co-opt the moral enthusiasm of religions for the sake of ecology, especially since the source of the inspiration is the very religious symbols and ideas that they consider to be untrue and inappropriate.<sup>22</sup> Under such circumstances it is difficult to have a meaningful dialogue because, at a minimum, successful interaction presumes mutual respect. As David Byers observes, "Unless the scientific community treats religious principles as seriously as their own data, the deck is stacked from the beginning and dialogue is fruitless."<sup>23</sup>

The inability of most religious thinkers to comprehend scientific literature or to communicate easily within a scientific idiom quite understandably discourages interest among scientists. To date, most dialogues and joint activities have required that scientists operate within a religious or ethical field of reference rather than developing a context for research and reflection that is truly multi- or cross-disciplinary. Few theologians and theological ethicists are expert in a field of science, and many are not even scientifically literate. Most of those who are expert in both theology and science are trained scientists who turned to religion as a second career.

Nevertheless, there are signs of growing interest within the scientific community to reach across the historic divide with the religious community. While still a small minority, some seminaries and graduate religion departments have increasing numbers of students with scientific backgrounds, who are taking courses on religion and theology to enrich their own understanding and who are even enrolling in degree programs. The John Templeton Foundation's innovative program to promote the teaching of courses on the interaction between science and religion has stimulated the development of such course offerings at several universities, many of them team-taught by scientists and religion scholars. The establishment of such centers as the Faith and Science Exchange in Boston, the Center for Theology and the Natural Sciences at the Graduate Theological Union in Berkeley, the Institute for Theological Encounter with Science and Technology in St. Louis, and the Chicago Center for Religion and Science has provided fora for meaningful intellectual exploration between the fields and has promoted the development of collegial relationships among their staff and the participants in their programs. Two membership organizations, the Institute for Religion in an Age of Science and the American Scientific Affiliation, sponsor programs and publish journals that encour-



age broad discussion of and research into the relationship between religion and science.

The decision of the American Association for the Advancement of Science, the largest scientific membership organization in the world, to establish a Program of Dialogue on Science, Ethics, and Religion, which I direct, is another encouraging development. The program has three major objectives: (1) to promote knowledge about developments in science and technology within the religious community; (2) to provide opportunities for dialogue among members of the scientific and religious communities; and (3) to promote collaboration between members of the scientific and religious communities on projects that explore the ethical and religious implications of scientific developments. By offering scientists a vehicle for collaboration based in a scientific institution, the Program of Dialogue on Science, Ethics, and Religion may be able to encourage their participation in cross-disciplinary discussions and multidisciplinary projects.

## Meetings, Initiatives, and Dialogues on Environmental Issues

The past thirty years have been marked by increasing awareness of and heightened concern for the impact of human societies on our planet. In the 1960s, a few economists began to assess the hitherto unrecognized costs of economic growth to the environment. Kenneth Boulding, an economist concerned about the perils of the “reckless cowboy economy,” appealed to the National Council of Churches to promote an ethic of moderation, conservation, and recycling.<sup>24</sup> In 1967, Lynn White, a medieval historian, published an article in *Science* magazine entitled “The Historical Roots of Our Ecological Crisis,” in which he indicted Western Christianity and modern science and technology as two interrelated causes of contemporary environmental problems.<sup>25</sup> Two landmark studies in the 1970s raised the argument that modern industrial society is not sustainable. The first, *A Blueprint for Survival*,<sup>26</sup> was prepared by a group of British scientists and philosophers, and the second, *The Limits to Growth*,<sup>27</sup> was produced at the Massachusetts Institute of Technology under the sponsorship of the Club of Rome, an international group of scientists and industrialists. Based on its finding that five principal factors—population, capital, food, consumption of nonrenewable resources (including energy), and pollution—were growing exponentially at rapid rates, the latter study concludes that if present trends continue unchanged, “the limits to growth on this planet will be reached sometime within the next one hundred