

Reviews

Unprecedented Choices: Religious Ethics at the Frontiers of Genetic Science.

By Audrey R. Chapman. Minneapolis: Fortress Press, 1999. ix + 261 pages. \$22.00 (paper).

This book is a very welcome addition to the already distinguished series *Theology and the Sciences*. Audrey Chapman provides a well-informed critical discussion of both the implications of recent genetic science for religious ethics and the contribution that religious ethics have made, or might still make, for society at large as it attempts to evaluate the ethical and social implications of this science. As director of the Program of Dialogue on Science, Ethics and Religion at the American Association for the Advancement of Science (AAAS) at Washington, D.C., she is an ideal person to write this book. A decade of active engagement with religious leaders, theologians, and scientists on genetic issues, attempting to establish well-informed and credible responses, gives her the edge over many others. It also has left her less than sanguine about the overall contribution of religious ethicists to the crucial issues increasingly raised by genetic science.

Three substantial chapters survey, in turn, the contributions of religious ethicists, to (1) the possibility of human genetic engineering, (2) the possibility of human cloning, and (3) the ongoing debate about the patenting of life. Those who have been engaged actively in the current debate will be very familiar with the issues and arguments used, and Chapman adds little that is new in the first two of these areas. Nonetheless, what she does write is clear, accurate, and perceptive. Because she adopts a survey style rather than a thematic approach in these chapters, there is a considerable amount of repetition of points, arguments, and even quotations. She also does not seem particularly aware of parallel British and European discussions. As in the United States, a number of British religious ethicists have been discussing genetic issues over the last decade, and most British government or Foundation reports on genetics and ethics have included religious ethicists in their panels. An adequate survey should include more of these non-American contributions, although I am not sure that it would finally add much to the actual substance of the debate. There are as yet only so many points to be made about the merits or otherwise of novel but circumscribed areas such as genetic engineering or reproductive cloning.

It is in the third area—on the patenting of life—that Chapman makes a distinctly more original contribution. She takes as her starting point the Joint Appeal against Human and Animal Patenting made in May 1995 by more than eighty religious leaders. The Appeal opposed the patenting of human and animal life forms on the grounds that “humans and animals are creations of God, not

humans, and as such should not be patented as human inventions.” Instructively, this is the area that has most actively concerned her work for the AAAS. Because of the legal complications in this area debate about it has been particularly convoluted both in the United States and in Europe. Chapman offers a useful guide through this legal minefield and a clarification of the specifically ethical issues identified in the secular debate before turning at some length to the theological issues involved. At this point she offers an important critique of what she sees as the simplicities of the Joint Appeal. She argues that it has been a long-standing tendency of religious leaders in such debates to offer rhetoric rather than properly informed argument. For example, as it stands, she believes that the Joint Appeal depends upon a static, pre-evolutionary understanding of creation in which life forms are firmly fixed by God. It also has an unnuanced understanding of “ownership” that takes no account of the concept of humans as “created co-creators” developed by theologians Philip Hefner and Ted Peters. She is skeptical about the legitimacy of religious leaders speaking on behalf of their faith traditions without extensive prior consultation of a strong cross-section of their members.

However, Chapman still believes in public theology and in religious ethicists seeking to influence society at large, especially on ethical issues. The two chapters that follow offer an extensive discussion, first, of how theologians should take more account of scientific developments, and then of how they should seek to engage in public theology. At the first of these levels she believes that most theologians have still to assimilate the implications of Darwin and modern genetics properly into their understanding of creation, human distinctiveness, sin, and the soul. She examines the claims of sociobiology and, like Stephen Pope, is sympathetic to a judicious assimilation even here (although she is rightly critical of some of the more exaggerated claims of Richard Dawkins and Edward O. Wilson). At the second level she argues repeatedly that public theology in the area of genetic science should succumb neither to the abandonment of theistic language (she is particularly critical of James Childress on this account in his highly influential medical ethics) nor to simplistic biblical or theological claims.

This last point is crucial to all of us who work as religious ethicists alongside physical and social scientists and will be of special interest to readers of *Zygon*. What is the responsible way to do religious ethics on scientific issues within pluralistic, modern societies? Chapman is well aware that some secular scientists would exclude religious ethicists from any discussion that impinges on their work. She counters this with the position taken by the National Bioethics Advisory Commission, that the claims of religious traditions should be taken seriously, without being regarded as determinative, because historically and currently they mold the moral views of many citizens. Once it is acknowledged that secularists themselves do not arrive at moral positions independently of culture, there is a strong ground for not excluding any significant section of a particular culture. So far, so good.

The next stage of Chapman's position is more problematic. Her book is strongest when exposing the inadequacies of various religious positions, either because they fail to properly understand genetic science or because they make tendentious connections between theology and particular claims or prescriptions relating to genetic science. Such religious responses thus fail at either the cognitive or the hermeneutical level. Yet her own connections are quite tentative and are seldom

distinctively theological. She argues that religious ethicists tend to differ from secular ethicists in a number of important ways: they are more likely to move beyond individual autonomy and consent and to emphasize wider interpersonal and social relationships; they are more committed to justice and concern for the vulnerable; and they belong to religious communities with uniquely long traditions of moral discussion and attention to moral behavior.

I agree strongly with all three distinctive virtues and see them as crucial to my own work with secular bodies, in my case as a member of the British Medical Association's Medical Ethics Committee. All of these, however, are derivative virtues rather than the explicitly doctrinal claims usually advanced by exponents of public theology. Chapman claims briefly that there is a greater tolerance in secular society today for theistic arguments (but, tellingly, she does not make the same claim for christological arguments). Perhaps this is true in the United States—although I doubt if it is true in the U.S. secular academy—but I fear that it is not true in Britain or more widely in much of Europe, where memories of religious wars and/or religious hegemonies are still too recent for this to be possible. Given the latter, the religious ethicist engaged in the genetics debate within the public forum may simply have to choose to either (1) use explicitly religious arguments and, in the process, inform their religious communities but be ignored by society at large, or (2) represent the virtues of social concern and justice derived from their communities while largely eschewing public discussion of theological meta-ethics. If Stanley Hauerwas represents the first position in the United States, James Childress represents the second. Within Britain, Oliver O'Donovan and I represent a similar polarity. Those from the first position often regard those from the second as faithless, whereas those from the second tend to regard those from the first as sectarian. Neither label withstands much scrutiny, if left unqualified, because these differing positions are primarily public strategies rather than ontologies. Still, they remain difficult to resolve and continue to have a profound effect on religious ethics at the frontiers of genetic research.

Chapman has more work to do if she is to be convincing that there is a viable middle option. She has, nevertheless, written an important and helpful book on an area of prime ethical interest today.

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The Mind of the Universe: Understanding Science and Religion. By Mariano Artigas. Philadelphia: The Templeton Foundation Press, 2000. xx + 364 pages. \$22.95.

Mariano Artigas, a Roman Catholic priest and professor of natural science at the University of Navarra in Pamplona, Spain, addresses some of the difficult yet germane concerns pertaining to the science-and-religion dialogue. Artigas, in his easily accessible eight chapters, reflects on chaos theory, self-organization in biological evolution, thermodynamics, teleology, the rationality and ethics of science, and the writings of scholars from Sir Karl Popper to Paul Feyerabend. After subsequent analysis of the ideas proposed by many experimental theories or philosophies, Artigas concludes by revealing how to bridge the methodological gap between science and religion in order to provide the basis for a rational search for philosophical meaning of new scientific theories.

Artigas begins by discussing the presuppositions that underlie and support empirical science. His systematic examination of scientific assumptions should be recognized as a monumental success; nowhere in the literature does any other scholar explore this matter with such breadth and meticulous attention. He articulates that scientists possess three foundational presuppositions in order to perform experimental research: belief in the existence and intelligibility of natural order, faith in human ability to uncover truths about nature, and the existence of values in scientific explorations and decision making. The acknowledgment that science contains philosophical presuppositions that are necessary for the establishment of experimentation is a critical point of the book that opposes the idea, advocated by many empiricists, that philosophy is irrelevant to science. Scientific progress reveals that these presuppositions exist and validates the power of the scientific approach, which is mistakenly rejected by thinkers skeptical of scientific methods. In his introduction Artigas explains:

Scientific progress provides feedback on these presuppositions, because it retrojustifies, enriches and refines them. Just as these presuppositions are necessary conditions for the existence of science, scientific progress is sufficient evidence of their existence and enables us to determine their scope.

Seen in the light of that feedback, the analysis of these presuppositions can provide a clue to the philosophical meaning of scientific progress and, therefore, to its theological relevance. (p. xix)

Artigas acknowledges the methodological gap between science and theology during his analysis of boundary questions, which are currently perceived as the potential bridges between science and religion. Nevertheless, he explores the presuppositions of science throughout the work to bridge the two disciplines, because he thinks that the presuppositions themselves, as well as the insights they provide, will yield the most fruitful material for true discussion. It is clear that neither science nor theology can explain everything, and Artigas's articulation of scientific assumptions and his strategy for epistemological research is a breakthrough in the science-and-religion dialogue. Essentially, as Artigas himself explains, "to bridge [the gap between science and religion] we will need to use intellectual tools, which must include elements common to the opposite sides of the bridge" (p. 12). Philosophy, then, acts as the mediator between science and

religion, for neither alone can answer questions that lie outside their respective domains.

The very fact that science harbors metascientific assumptions leads Artigas to introduce two realizations germane to the fertility of the science-and-religion dialogue. The first is the recognition that metascientific foundationalism must have arisen in history somehow. The second is that progress in science must reveal something about the rationalistic and spiritualistic dimension of human nature.

Following the lead of Stanley Jaki, Artigas respects the view that Christianity throughout history has provided a cultural matrix whereby scientific presuppositions would have been introduced. For example, faith in an intelligible natural order was a Christian premise vital for the birth of empirical exploration. Such an illumination makes tangible the possibility of a fruitful and justified dialogue between science and religion. No longer is its dismissal as an artifact of modern cultural influence and propaganda vindicable. A logical parameter exists for promoting the dialogue, and it foreshadows the ultimate success of the dialogue.

In part 2 of the book, Artigas analyzes the various theories postulated for a comprehensive worldview and introduces information for a new and more unified picture of the world that has scientific support from work on thermodynamics of irreversible processes, catastrophe theory, synergetics, deterministic chaos, and theoretical research on biological self-organization and evolutionary emergence. This new scientific worldview confirms the values of Christian ideas of a natural order and the human ability to understand that order and even amplifies them. In addition, Artigas sees the *rationality* of science as a component of the overall rationality of human beings. He concludes,

... the feedback of scientific progress on the epistemological presuppositions of science demonstrates that we transcend nature even though we are a part of it. Scientific creativity is a proof of our singularity. It shows that we possess dimensions that transcend the natural level and can be labeled as spiritual. The very existence and progress of the natural sciences are two of the best arguments for our spiritual character. (p. 246)

The acknowledgment of human spirituality unavoidably leads one to question the source of such spirituality. In light of this, Artigas advocates that scientific progress ultimately reconfirms his view that God exists and that “man is a cocreator who participates in God’s plans” (p. 247).

Recognition of human spirituality and its relation to the divine from philosophic reflection of scientific progress also leads one to consider the ethical, value-laden component to the scientific enterprise. Essentially, apart from ontological and epistemological presuppositions, there also exist *ethical* presuppositions of science that are needed for its continuation. In part 4, Artigas presents a comprehensive analysis of the various kinds of values embedded in the scientific enterprise. *Constitutive* values encompass the general, unchangeable goals of science, such as the search for truth and controlled dominion over nature. *Institutional* values refer to the social aspect of science—values that are derived from the “communal” character of the scientific enterprise, such as cooperativeness, intellectual humility, and open-mindedness in scientific research. Like ontological and epistemological presuppositions, the ethical presuppositions of science are retrojustified by scientific progress. Consequently, Artigas explains, “our mastery over nature should not be tyrannical” (p. 248) but rather directed toward opening up new

vistas of exploration and promotion of civilization that can lead to veneration of nature, reverence for its creator, and respect toward ourselves.

Artigas ends his work by affirming a scientific realism about the world that can harmonize with religious belief. He explains that science is committed to discovering partial or "contextual" truths about nature, which are validated by the predictive, fertile, and explanatory power of science. Such a commitment of science to discover truth parallels the commitment of religion to discover truth.

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The Philosophy of Nature of St. Thomas Aquinas: Nature, the Universe, Man.

By Leo Elders. Frankfurt am Main and New York: Peter Lang, 1997.
387 pages. \$57.95 (paper).

Leo Elders provides a sweeping and detailed examination of Aquinas's philosophy of nature. The book is divided into two main sections. The first explicates Aquinas's "General Philosophy of Nature," including his view of substance, motion, change, and time. The second, more lengthy, section examines his "Particular Philosophy of Nature," including local movement, the structure and duration of the universe, the nature of change, organic life, sense knowledge, human nature, the soul, the intellect, the will, temporality, and the place of humanity within nature. Elders is aware of the importance of cosmology, but his major concern is with human nature, or philosophical anthropology. He devotes the bulk of his attention to this topic in order to make available what he takes to be Aquinas's major and perennial insights.

Elders summarizes the anthropology of Aquinas in six themes: the body-soul unity of the person, the immateriality of the soul, the soul as the form of the body, the infinite capacity of the human mind, the person as the image of God, and the person as *homo viator*, a being on the way to a transcendent goal. Elders's monograph provides a very helpful, detailed explication of Aquinas's understanding of and arguments for these central anthropological themes, as well as a helpful contextualization of their place within Greek, medieval, and modern philosophies of nature. The author is clearly steeped in Thomistic scholarship and provides reliable guidance in this complex body of literature.

Elders writes not only descriptively, as an intellectual historian, but also normatively, as an advocate of Aquinas's philosophy: he believes that Aquinas's philosophical account of human nature continues to be the only adequate philosophical perspective. He tends to write as an originalist who believes that Aquinas stands well enough on his own, even for us today, rather than as a reconstructivist who believes (as did, for example, Karl Rahner and Bernard Lonergan) that major renovations must be made to make Aquinas intelligible for and relevant to our day. "More than seven centuries separate us from St. Thomas, but human nature remains the same, as long as there will be men," writes Elders; "the answers elaborated by Thomas Aquinas as to man's nature, his mind and free will, the origin

and destiny of the soul, retain their truth and value" (p. 373). Thus, the book also carries a somewhat polemical tone against what its author takes to be major contemporary competitors of Thomistic anthropology—Bergsonianism, Marxism, and existentialism.

This having been said, Elders understands that modern science has thrown light on human nature in ways unanticipated by Aquinas. Elders believes that all that is true in contemporary science is compatible with the authentic philosophical anthropology of Aquinas. Aquinas, he believes, offers the proper philosophical framework and foundation within which one can properly appropriate the insights of the various sciences. Hence, Elders proposes that contemporary science can correct the empirical mistakes Aquinas inevitably absorbed from the available culture of his day, while Thomism can correct and provide a more sound alternative to the philosophical distortions to which contemporary scientists are often (and unsuspectingly) prone.

This book offers a quite helpful introduction to the central themes in Aquinas's philosophy of nature. Yet, when Elders introduces issues from contemporary science, he merely suggests connections rather than establishes their relation in a detailed and theoretically satisfying argument. For example, he asserts that the "anthropic principle" is already resident in Aquinas's cosmology (p. 134) but neither explains what he means by this nor defends this assertion against obvious anticipated counter-arguments.

Neither does he engage in depth any alternative construals of nature that hold a major place in current philosophical circles. Karl Popper, Thomas Kuhn, Imre Lakatos, and Nancey Murphy do not even appear in the index. One will also be disappointed if looking for a detailed discussion of the philosophical implications of evolutionary theory for Thomistic anthropology; indeed, Elders's own understanding of evolution and Darwinism leaves a lot to be desired (see, for example, pp. 349ff.). To mention just one problem, he asserts without argument that if species evolve, the evolutionary process must be guided by an "outside cause" (p. 360) of the sort that is attacked thoroughly by Dawkins and others but is neither defended nor even explained by Elders. In general, the book conveys a sense of self-confidence cultivated in intellectual isolation. Elders is content to rehearse the Thomistic arguments for the immateriality of cognition without engaging contemporary scientifically informed philosophers of mind such as Daniel Dennett or Owen Flanagan who argue vigorously against this immateriality. The same is true of his claims that thought is prior to language (pp. 227–28), that natural desire cannot be in vain (p. 284f.), and that everything in the material universe is directed to the human soul (p. 336).

In my opinion, this book is read profitably as an exercise in the history of ideas. The author knows Aquinas. He is a widely respected scholar who provides here a basic resource for historical study. Those seeking a more constructive engagement with contemporary debates connecting Thomistic philosophy of nature with current philosophical and scientific theories of nature should look elsewhere.

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The Far-Future Universe: Eschatology from a Cosmic Perspective. Edited by George F. R. Ellis. Published in association with the Pontifical Academy of Sciences and the Vatican Observatory. Philadelphia and London: Templeton Foundation Press, 2002. ix +384 pages. \$39.95.

Many answers have been given to the question of the ultimate end of the universe. Will it end with a slow heat death as its entropy approaches its maximum value, or will it end in a mighty explosion? As our sun reaches the end of its life, will it be possible for the human species to survive by traveling to a planet orbiting a distant star? These questions refer to the far distant future and so are hardly a matter of urgency, but it is interesting to see what contemporary scientific research says about them.

The editor of this collection of essays, George F. R. Ellis, is a well-known astronomer, and he brought together a very distinguished group of cosmologists and theologians to consider this question at a conference held in the villa occupied by the Pontifical Academy of Sciences in Vatican City.

After an introduction by Ellis, George Coyne, S.J., considers the theological perspective. He emphasizes that, in spite of all we already know about the evolution of the universe, we must recognize the limitations of our scientific knowledge when we speculate about the far distant future and recognize that it is also a theological question relating to the actions of God the Creator. As such, it is much more than a scientific problem; it concerns our personal relationship to God, who brought the universe into being and controls the destiny of each of us.

Four scientists—John Barrow, Paul Davies, Michael Heller, S.J., and Martin Rees—then address the problem from the cosmological point of view. Barrow outlines some of the physical possibilities, emphasizing the importance of the quantum vacuum. Davies describes six cosmological models, together with what they imply for the ultimate fate of the universe. Heller considers the concept of time in recent cosmological studies. Rees asks whether there are intelligent aliens to share our future. Is the universe made especially for us by an all-powerful Creator? Are there many universes, governed by different laws?

The next section considers the problem from a biological perspective. Graham Cairns-Smith, who has studied early evolution, examines exotic genetic materials and points out that the concept of life may be much wider than what we know now. Two seminal papers by theoretical physicist Freeman Dyson on “Physics and Biology in an Open Universe” and on whether life is digital or analog give a mathematically sophisticated account of possible ways the universe could end. He considers three questions about the end of the universe and concludes that it is unlikely to end as a permanent freeze, that it is possible for life to survive indefinitely, and that it may be possible to send information from one galaxy to another, even though the people on them are participating in the cosmic expansion. Dyson thinks that it is possible for life to evolve into transhuman existence in an analog or digital computer. He concludes that analog life could survive indefinitely on a finite amount of energy, although that would involve progressive reduction in the quality of life.

In the final essay of the biological section, Simon Conway Morris asks whether biology can have an eschatology, and, if so, whether this has cosmological implications. He concludes that “biology and evolution possess an inherent structure

that is not only consistent with the plenitude of the biosphere but more controversially is so arranged as to preordain the emergence of one (or more) sentient species." This argument is similar to the anthropic principle in cosmology and fits naturally within an eschatological perspective.

The next section contains four essays under the heading of Humanity. Stephen Clark begins with a study of deep time, by which he means "the ethical and metaphysical effect of placing ourselves in the context of bygone and future ages." There are various possibilities for the future; it may be catastrophic and short, or long and triumphant. A related theme is taken up by Steven Brams and Marc Kilgour, who write on "games that end with a bang or a whimper" and consider the various strategies that can be adopted by contestants in games and their application to warfare. They make a vital distinction between bounded and unbounded games, emphasizing that the latter "encourage co-operative play, foster hope and lead to more auspicious outcomes." The vital question of artificial intelligence and the far future is then discussed by Margaret Boden. She asks whether it will support and enrich or undermine our ideas about humanity. Intelligence may migrate to machines, but maybe intelligent life cannot. Finally, in a chapter on cosmic eschatology versus human eschatology Owen Gingerich assesses the future of humanity on human and cosmic time scales. He questions traditional views of eternity and puts forward the concept of a timeless eternity. The Christian who faces the problem of the purpose of it all can perhaps find the best response in trust.

The last section is devoted to theology. It begins with an essay by Keith Ward on cosmology and religious ideas about the end of the world. He surveys the beliefs of Eastern religions and those of Judaism, Islam, and Christianity. Some Eastern religions such as Hinduism and Buddhism adhere to a cyclical view of time, whereas others like Taoism and Confucianism are not much concerned about the end of the world. Judaism and Islam, together with Christianity, have a vision of hope for the future. Modern knowledge of the universe adds depth to this vision. Jürgen Moltmann in "Cosmos and Theosis: Eschatological Perspectives on the Future of the Universe" points out the contrasts between the ideas of a beginning and an end and emphasizes the central importance of the resurrection of Christ. He looks forward to a transformation of the world, when everything is made new. In his contribution, "Eschatology and Physical Cosmology," Robert Russell contrasts theological views with scientific and humanistic views and asks how they may be reconciled. Finally, editor Ellis observes that discussion of what happens in the far future depends on one's ontology, or what is considered as truly existing. Some forms of existence are intrinsically eternal, while others change and die away. This unites ontology and causality from the scientific point of view and its extension to morality and theology. An essay of Olaf Stapleton, reprinted as an appendix, raises many of these issues in fictional form.

These brief summaries only hint at the richness of the discussion and the wide range of subjects covered. It would be difficult to think of a more distinguished and qualified group of scientists and theologians who can say what we know and what we can speculate about so vast and mysterious a theme.

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Rethinking Theology and Science: Six Models for the Current Dialogue. Edited by Niels Henrik Gregersen and J. Wentzel van Huyssteen. Grand Rapids: William B. Eerdmans, 1998. viii + 240 pages. \$25.00 (paper).

Attempting to move beyond first-generation thinkers Ian Barbour, Arthur Peacocke, and John Polkinghorne, six philosophically trained professors in theological academic positions analyze the current dialogue between science and theology. Cognitive disunity in both science and theology shown by postmodern criticism forms the background of the conversation. The unstated thesis of all the essayists is that novel philosophical analysis, especially of the issue of realism, becomes the most effective means of enabling the discussion.

I find little new in their presentation that has not been more acutely presented by the three major philosophers of the last century, Edmund Husserl (phenomenology), Ludwig Wittgenstein (language analysis), and Alfred North Whitehead (process thought).

Although the six authors refer to and build upon Nicholas Rescher and other contemporary philosophers, they do not consider obvious applicable objections from phenomenology, language analysis, or process thought, even when they are championing one of these positions. For example, Eberhard Herrmann, who tries to engage the problem of pluralism, gives a language-analysis approach based on statements but fails to show any criticism of his position from phenomenological thought or the process logic of Whiteheadian propositions. One would think that since unity, or lack thereof, in both science and religion is so important, consideration would be given to phenomenological studies of science and religion that establish unity of subject matter without assuming substantive existence external to human minds. Because all of the authors affirm some variety of ontological realism, I find particularly egregious the complete neglect of Whitehead, the one avowed realist among the three major philosophers.

The six articles are substantive, philosophically sophisticated, and helpful to the current debate if one accepts a position stated by Kees van Kooten Niekerk: "the human mind . . . has no direct access to the external world" (p. 68). Herrmann puts it, "We cannot directly compare statements about the world with reality itself" (p. 138). I find comparable assertions in the other authors. They all assume that we know best our own mental existence (abstractions) from which we must infer reality itself.

Whitehead turns this mentalist assumption on its head by affirming that all entities, including rational human agents, synthesize what they are in terms of a selection from direct but partial access to their past external world. Within a process perspective the traditional question of realism, whether one can argue from abstractions to existence, is no longer an issue. We know external existence because, using Whiteheadian language, we apprehend it. The question becomes how and to what degree the abstractions we create out of such apprehensions describe the known and felt real world.

The authors of this book take more seriously the process orientation of their acknowledged mentors, Barbour and Rescher, who both affirm the priority of events over substance. In my judgment, the realism of Whitehead has advantages over that of Rescher. For Whitehead the discreteness of events is defined by the events themselves, for Rescher by observers. This means, from a Whiteheadian

perspective, that subjects like electrons, human soul events, and God exist in radical independence of human consciousness. Yet, an explanation of pluralism and why cognitive unity in science and religion is so difficult to obtain follows naturally from Whiteheadian realism.

J. Wentzel van Huyssteen in "Postfoundationalism in Theology and Science: Beyond Conflict and Consonance" forcefully reminds us that the rationality of both theology and science is to be found only in their developing traditions. He proposes a model of rationality in which the rational agent is taken as primary, rationality is determined by social conditions not rules, hence expertise within the community defines the quality of reason. Process thought points to a plurality of objects as well as scientific or religious positions—for example, physical rocks and the scientific paradigms of Thomas Kuhn. The molecules of rocks and the rational personal events of scientists absorb the structure of their being and understanding from their limited direct experience of their relevant historical past. The past causal molecular rock-events and scientist-mental-events so enable and constrain both the societal rock and scientific culture that rocks continue to be rocks and scientists continue to work within the normal science of the paradigm.

In "A Critical Realist Perspective on the Dialogue between Theology and Science," Niekerk emphasizes the importance of critical realism for the science-religion debate. He asserts that science and religion deal with entities independent of our experience, science more with objects to which probabilistic mathematics may apply and religion with subjects, particularly God, involving intention and emotion. Since both kinds of entities are subject to the limitations of the activities of knowing, Niekerk also recommends community-based communication between science and religion following appropriate canons of rational discourse. Process thought can be used to develop the major concerns of Niekerk—with a far more vigorous realism.

Willem B. Drees in "The Significance of Scientific Images: A Naturalist Stance" affirms a "hard" naturalism. Nature is "the whole of reality" in which nothing supernatural or spiritual shows up. It is a unity composed of all the same small ontological physical constituents. Apparent transcendence within nature, for example the transcendence of human existence over that of cellular or atomic existence, is explained by the complexity of the microscopic ontological real constituents of the universe. Of course, Drees as a rational agent can define nature, but his definition has authority only if he is something more than the collection of his subatomic parts. Why not accept a process position that allows ontological transcendence of the human rational soul within nature and then show process compatibility with contemporary science? There are many process physicists, biologists, psychologists, and others who have done exactly that. God can then be a subject of direct consideration rather than being pushed to the evaporative limits at the edge of cosmology, as Drees suggests.

Herrmann, in "A Pragmatic Approach to Religion and Science," a language-analysis approach, provides an epistemological analysis of statements in order to affirm many views of life that develop because of a human desire to cope with contingencies. Herrmann assumes that God as well as physical things are inferred by language and, hence, from a mentalist assumption, do not necessarily function as existents in the real world. Yet Herrmann wants a limited realism. To me it is easier and more satisfying to affirm a realism that acknowledges subjects in both

science and religion that have similarities and then show how abstractions affect and limit our knowledge through the epistemological procedures of Whiteheadian concrescence.

In "Science and Theology as Complementary Perspectives" Fraser Watts affirms a referential realism in which the domains of the reality of science and religion coinhere. In his view science and religion approach reality from such different perspectives that they become quite distinct discourses. They are complementary in a way exemplified by the mind-body problem. Because he assumes that there is no underlying fundamental metaphysical language for relating mind and brain, Watts shows the radical disparity between mind-language and brain-language. Similar claims are made for more general science-language and God-language. My criticism of Watts is his apparent unawareness of the pioneering work of David Griffin, who reconciles the mind-body dilemma from a process perspective in his *Unsnarling the World Knot: Consciousness, Freedom, and the Mind-body Problem* (Berkeley: Univ. of California Press, 1998). Following Watts's analogy, Griffin's solution of the mind-body problem suggests a successful process understanding of the relationship of science and religion.

Niels Henrik Gregersen's "A Contextual Coherence Theory for the Science-Theology Dialogue" using Rescher's philosophy is essentially compatible with Whitehead. I wish that Gregersen and the other authors of the book had more seriously considered Whitehead's robust realism rather than presenting a somewhat puny one entailed by their mentalist presuppositions.

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The Human Person in Science and Theology. Edited by Niels Henrik Gregersen, Willem B. Drees, and Ulf Gorman. Edinburgh: T&T Clark, 2000. 230 pages. \$25.00 (paper).

Niels Henrik Gregersen, a theologian at the University of Aarhus, Denmark, Willem B. Drees, chaired professor of nature and technology at the University of Twente, and Ulf Gorman, who teaches theology and religious studies at Lund University, Sweden, have assembled a solid series of essays in this book. Contributors to their collection, the product of a 1998 conference organized by the European Society for the Study of Science and Theology (ESSSAT), agree that prevailing notions of personhood must be seriously modified by philosophy and theology. They are unified in rejecting two conflicting modern views: the transcendence, or existential, view with its individualistic and subjectivist notions of the self (a synonym for person) and the physicalist view with its emphasis on the reduction of mental life to the deterministic computational biochemistry of the brain.

By near consensus, their preferred alternative is the "bio-cultural paradigm," designed to overcome the "bogus dichotomy between the personal and the em-

pirical" (p. 7). In this new model, the person, or self, is the offspring of two parents, biological and social. That is, a person is "embedded" (to use a term currently in fashion) in nature *and* nurture. In his informative introductory essay, Gregersen says that "the human person emerges as the result of the *interference* between the biological roots of human personhood and the cultural nexus of which any person is a part" (p. 6). The self, even in its spiritual portions, does not hover independently just beyond the brain's neural network. And the cherished autonomy of the individual is not the consequence of some inner aspect—the conscience or will—that defines its essence. Rather, like Arthur Koestler's Janus-faced "holon," the embedded self looks down to its biological foundation in the brain and up to its cultural environment as mutual sources for its origin. Neither of these dimensions alone is sufficient; both are necessary in any account of the human person.

The essays of the first of the book's two major parts circle in upon this major theme. Mary Midgley's "Consciousness, Fatalism, and Science" is rich with insightful commentary that dismantles the "ordinary humbug" of the physicalist model of mentality and volition. "The brain," she says, "is simply a part of us, a useful (but rather complicated) bit of meat packed inside our skulls. It does not make us think; we think with it, as we walk with our feet and digest with our internal organs" (p. 30). Midgley repeatedly returns to the image of the Chinese vase sitting on a table. The vase can be approached from many angles including its physical aspects, history, and function. All of these are integrated into a single whole in the same sense as the mind is integrated with the brain and the larger cultural context.

Fraser Watts, a psychologist and theologian, echoes Midgley in his essay "The Multifaceted Nature of Human Personhood." Watts argues for a balanced approach to the biological, individual, and social dimensions of religious experience as opposed to assigning primacy to any one of them. Hugo Lagercranz, a Swedish pediatrician, contributes a discussion of the incredible pliant infant brain. In "The Child's Brain" Lagercranz notes that 200,000 neurons are formed in the human fetus *every minute* between the eighth and eighteenth gestational weeks. Then nearly half of these neurons formed in the womb disappear in early infancy as the brain rushes to organize itself in response to experience, including, presumably, cultural experience. So much for strict neurogenic determinism.

Philip Hefner, editor of *Zygon* and past director of the Zygon Center for Religion and Science in Chicago, and Michel Welker, who teaches theology at the University of Heidelberg, conclude the book's first part with essays that argue strongly for Gregersen's notion of the person arising from the "interface between the biological roots and cultural nexus." In addition to his thesis that the construction of the human person is a response to biological or evolutionary and cultural conditions, Hefner offers the further important insight that "the formation of our personhood is . . . a theological transaction" (p. 86). We are indeed *imago Dei*, in the image of God. Following Wolfhart Pannenberg in rejecting the idea that God is a projection of the perfected human person on the screen of the cosmos, Hefner maintains that early humans became persons by relating to the divine as the personal source of order in the contingent stream of events in nature. This historical relation with a Thou witnessed in religious traditions continues to

fashion our character as authentic and open persons. Welker rejects the traditional image of the private self “behind the mask” striving to protect itself and remain consistent with the public self in front of the mask. This subjective *I* runs into trouble in contemporary culture where market and media forces threaten to destroy its precious autonomy. The new task of theology, he concludes, is to “work on a new description” of the self that removes this obsolete dichotomy.

The essays in Part 2, “Supervenience, Mind, and Culture,” examine the notion currently debated in the dialogue between science and theology that, although constituted by brain states, mental events are not reducible to these states and may, according to some commentators, even influence brain states through a teleological (purpose-oriented) top-down causality. Enter culture. Mental events arise out of a nexus or network of social meaning, institutional and linguistic, for example, and constitute a relational notion of the person. Hence, neither mentality nor personhood can be explained entirely by brain chemistry or physics.

Dennis Bielfeldt, a professor of philosophy and religion at South Dakota State University, introduces “the peril and promise of supervenience.” In the midst of heavy going here, the reader will readily agree with the author’s own assessment. “It should be obvious from this essay,” he says, “that supervenience is a rather technical philosophical notion that admits of various formulations” (p. 146). Bielfeldt praises supervenience for eliminating dualism and the reducibility of whole to part—both positive results for theology. But he is less than sanguine about downward causation of either the mind on the brain or God on the physical world. What is worse, just as mind emerges from states of the brain, so a god modeled on supervenience emerges from the states of the material world—a conclusion theists will find entirely unpalatable.

In another well-argued but challenging piece, Gregersen develops an alternative version of nonreductive and holistic supervenience and applies the notion to the Lutheran theology of the Eucharist. This task is carried forth by enlisting Karl Popper’s framework of three worlds: the worlds of physical facts, mental states, and human culture. While this is an insightful and constructive exercise, its technical arguments may be confusing to the uninitiated reader.

In a final essay, John Teske, who teaches psychology at Elizabethtown College in Pennsylvania, carries the biocultural paradigm to its logical conclusions. His thesis is that “the human spirit can be understood as a social and historical construction, dependent upon but not determined by human neuropsychology, in turn embedded within the evolutionary emergence of evolutionary processes” (p. 190). Teske uses *spirit* somewhat like others use *person* or *self*. The self is contingent, radically relational, and socially constructed and is best understood through narrative, an approach totally unsuited to physicalist models of the mind.

The Human Person is an exceedingly competent effort to give voice to a reasonable alternative to the highly visible advocates of narrow reductionistic physicalism. More than simply a defensive response, however, the biocultural paradigm it advocates provides a welcome opportunity for further important theological construction that many *Zygon* readers will find exciting.

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