Reviews

Creation and the End of Days: Judaism and Scientific Cosmology. Edited by DAVID NOVAK and NORBERT SAMUELSON. Lanham, Maryland: University Press of America, 1986. 276 pages + introduction and indices. $26.75; $14.50 (paper).

This volume from the "Studies in Judaism" series contains the Proceedings of the 1984 Meeting of the Academy for Jewish Philosophy. There are essays by eleven contributors who present some of the basic facts and concepts of the scientific cosmology of the twentieth century together with important aspects of Jewish cosmological thought. Since cosmology is in some senses the "largest" area of modern science, studies of its relationships with major religious and/or philosophical traditions are valuable. The present collection provides material for such a study, but by its very nature as a collection of papers by different authors it does not give a complete treatment. The mainstream Big Bang model and its supporting evidence and recent extrapolations receive broad non-technical coverage in the first essays. The later ones, which focus more on the specifically Jewish tradition, concentrate on issues and/or philosophers within that tradition.

It should be noted that this collection originates in the Academy for Jewish *Philosophy*. Thus the theology here is generally philosophical theology. There is relatively little explicit treatment of Scripture, though biblical influence is, of course, clear in many places. The discussion in the later philosophical essays is more specialized than in the earlier scientific ones, reflecting again the fact that the presentation is primarily for philosophers rather than for physicists.

One of the editors, David Novak, provides a helpful introduction in which the contributions of the different authors are summarized. One unfortunate omission from the book is that of any information about the essayists themselves.

The first five papers cover the present situation in scientific cosmology. Harry Shipman, in "The Creation of Order from Chaos: Making Galaxies, Stars, Planets, and People from Uniformly Expanding Matter," describes the origin and evolution of the various structures in the universe. He also suggests some helpful distinctions among the degrees of confidence which one may have in different cosmological ideas. The now well-understood description of the formation of the simplest atomic nuclei, for example, he classifies as a "concrete theory," while ideas about the origin of life are at present only "speculative scenarios." It would be advisable for all discussions of scientific cosmology, and especially those for non-scientists, to emphasize such distinctions.

John Huchra's "On Contemporary Observational Cosmology: When Did It All Begin?," concentrates on the basic observational problem of determining distances to extragalactic objects and thus (through Hubble's relations between distance and velocity) of estimating "the age of the universe." J. Richard Gott's

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"The Very Early Universe" is more speculative. He describes recent inflationary models and his own "bubble universe" model for the earliest fractions of a second of the universal expansion.

In "The Three Eras of Cosmic Evolution," Eric Chaisson presents an evolutionary view of the universe. The three eras are characterized, successively, by the dominance of radiation, of matter, and of life. That latter era, Chaisson points out, has not yet fully arrived, and may not. But the cosmic significance of the evolution of intelligent life seems clear to him: "We, perhaps with other advanced life forms in the cosmos, have become the collective consciousness of the universe" (p. 55). In "The Universe: Always Room for More?", Margaret Geller returns to observational issues in her discussion of whether current evidence favors a finite or infinite universe. On this topic philosophical prejudices abound and scientific data are hard to gather. The present evidence seems to favor a low-density, infinite universe.

By far the longest essay in the book is Barry Kogan's "Judaism and Scientific Cosmology: Redesigning the Design Argument." It is also the most self-contained, treating the current scientific picture, a number of Jewish reflections on cosmology, and modern discussions of design arguments for the existence of God as one way of relating scientific cosmology and philosophical theology. Kogan comments briefly on the creation narratives of Genesis and points out that the Hebrew canon also closes in 2 Chronicles on a cosmological note. He sees little "overlap" between the scientific picture of the universe and the biblical accounts of creation, but finds more overlap in the later writings of Rabbi Abbahu and Judah Halevi. In particular, the latter's metaphor of the world as *Sefer*, as a text, is valuable. Kogan's analysis of the structure of design arguments, including recent versions by Richard Taylor and by Richard Swinburne, is helpful. Such arguments require empirical data, and Kogan sketches some of the evidence which has led in recent years to various forms of "anthropic principles" related to design arguments. (Shipman's essay provides further comment on the anthropic principle.)

Jonathan Malino's "Scientific Cosmology and Creation" examines the implications of cosmology for the possibility of an adequate rational theology, with special attention to the views of Maimonides. He concludes that scientific cosmology may be relevant to the theological issues of creation. Alfred Ivry focuses entirely on "Maimonides on Creation," examining particularly that philosopher's careful attempt to distinguish between God's creation from "absolute privation"—"a nothing which is not nothingness"—and an absolute *creatio ex nihilo* which he regarded as philosophically impossible. Ivry is perhaps too cautious in referring to this view's "seeming self-contradiction" (p. 203).

Most of the authors in this volume concentrate on the "Creation" component of the title. The only one to deal at any length with "The End of Days" is Seymour Feldman in "The End of the Universe: A Medieval Debate." The question of the destructability of the universe was addressed by both Plato and Aristotle, and later discussions by Proclus (who argued that the world is indestructible) and by John Philoponus (who argued that it is destructible and will, in fact, disintegrate) were both carried out on the basis of Plato's *Timaeus*. These discussions were continued in the Jewish tradition by Maimonides, Gersonides, and Abravanel. Feldman's treatment of them is historically and philosophically interesting. He begins, however, by eschewing "any kind of messianic or redemptive concept"—that is, much of the meaning of eschatology in the biblical tradition—when he speaks of "the end of the universe" (p. 215). The debate is carried out primarily in terms of philosophical prin-

ciples, but empirical arguments (for example, the claim that certain drugs are now less effective than they once were) also are used. Today the second law of thermodynamics would have to be a major issue in the discussion.

The last two contributions deal with aspects of the cosmological thought of Gersonides. Jacob Staub, in "Gersonides and Contemporary Theories on the Beginning of the Universe," points out that the thought of this medieval Jewish writer is remarkable "particularly with regard to the rigor with which he insists that the laws of physics are so universal as to be retrojected to the very beginning" (p. 250). That is, the divine creation of the world can be described in accordance with the laws of physics. The extent to which that indeed may be the case is one of the most important topics for the science-theology dialogue, and it is good to have a sketch of Gersonides' thought on the matter as a resource for that dialogue. Whether or not Gersonides' uncreated "body which does not preserve its shape" (p. 249) can somehow be identified with quantum mechanical ideas of the vacuum state is another question. One must be careful about the ambiguous use of terms such as "energy" to bridge the gap between religious and scientific concepts of creation. "Energy" has a precise meaning for the physicist, and while scientific usage does not preclude use of the same word by philosophers or theologians, equation of "God" with "Energy" in the physicist's sense of the term (p. 256) seems to me a dubious procedure.

Goldstein's concluding "Preliminary Remarks on Levi Ben Gerson's Cosmology" relates Gersonides' ideas of the structure of the universe to other views current in the Middle Ages. It is primarily of interest for historical insights.

One rather surprising omission from this collection is any real discussion of the though of Albert Einstein, one of the foremost of Jewish—and indeed of *all*—thinkers whose work has affected modern cosmology. It would have been appropriate to include a study, from various angles, of his concepts of the structure and development of the universe.

Bearing in mind the limits of any anthology, *Creation and the End of Days* provides material which will be of value for those who are interested in the science-theology dialogue. It does not itself give detailed integration of scientific, philosophical, and theological views of the universe, but it does provide material which will be helpful for those engaged in that process of integration.

GEORGE L. MURPHY
Pastor, St. Mark Lutheran Church
Tallmadge, Ohio

Evolution as Religion: Strange Hopes and Stranger Fears. BY MARY MIDGLEY. London and New York: Methuen, 1986. 180 pages. $33.00; $12.95 (paper).

What we have before us is a really provocative book, one more polemic work written by the British philosopher Mary Midgley. The author was formerly senior lecturer in philosophy at the University of Newcastle-upon-Tyne and is now nurturing her age-long commitment to ecological causes, a concern which emerges in many places in the book. The basic purpose of this work is to assess the misuses of contemporary biological science from a philosophical perspective. As such, her book is timely and relevant, raising anew a discussion that has

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attracted philosophers, scientists, and theologians (see, for example, Stephen Toulmin's *The Return to Cosmology: Post Modern Science and the Theology of Nature* [Berkeley and Los Angeles: University of California Press, 1982]; Langdon Gilkey's *Religion and the Scientific Future* [New York: Harper & Row, 1970]; and John C. Greene's *Science, Ideology and World View* [Berkeley and Los Angeles: University of California Press, 1981]). Her argument rests on two main concepts: *drama*—the process of anthropomorphizing scientific theories and facts (rooted in one's drive for meaning); and *myth*—a particular view of the cosmos built on the same theories and facts. Using these concepts, she aims at describing the distorted dramas and myths that have infested biology and cosmology, to bring them out "into the open, to give them our full attention, understand them better and see what part, if any, each of them ought to play in theory and in life" (p. 4).

In a sequence of short chapters the author then proceeds to analyze a number of standpoints adopted by scientists who, according to her, represent trends in western thought, particularly the one which is loosely called "Spencerism." Jacques Monod, Richard Dawkins, genetic engineers, sociobiologists, B. F. Skinner, creationists; the basic tenets of them all are demolished by a relentless, even pitiless analysis conducted on two levels. On a theoretical level Midgley argues that these opinions, moods, attitudes, and beliefs are "bad science," illicit extrapolations from accredited scientific findings. On a moral level she intends to portray them as "bad religion," incapable of "saving" humankind and likely to deceive us as meaning-providers. What these standpoints have in common, in her view, is "first, that they center on the theme of evolution. Second, that while still using official scientific language, . . . they are quite contrary to currently accepted scientific doctrines. . . . Third, that they are powerfully emotive and sustaining" (p. 132). She divides the views into two broad categories: the "optimistic distortions" of scientific findings which envisage a bountiful future for the human race, the unending development of knowledge and power in the service of our happiness; and the "gloomy distortions" which find malign forces in the universe and in the process of evolution conspiring against the same human happiness and search for purpose.

The title of the book may be somewhat misleading: "evolution" here does not refer primarily to biological theory; it is rather an umbrella-notion associated even with the development of the physical universe. "Religion" is also a broad term, encompassing beliefs and attitudes that have spun off from the development of modern science and have to a certain extent replaced official Christianity. The main source for understanding the term seems to be William James's *Varieties of Religious Experience*. However, it is used interchangeably with drama and myth. Midgley's characterization of evolutionary dramas as religion is not always as consistent as in her fine analysis of the belief in the movement toward ever-greater intelligence (pp. 59-65). In other parts of the discussion, better-defined concepts such as *ideology* and *worldview* could be substituted for "religion" without any loss of meaning.

The *pièce de résistance* of Midgley's argument is her contention that all these dramas oversimplify what reality is; according to her, we know very little about the most important aspects of reality (p. 55 passim). She stresses, moreover, that most of the concepts around which the dramas are organized (such as *altruism*, *intelligence*, and *selfishness*) are highly complex and even contradictory. It is at least curious, however, that as a philosopher she contents herself with

emphasizing complexity, without any serious effort to provide clear and simple definitions for these concepts.

Even though the book is dedicated to Charles Darwin, "who did not say these things" (p. v), it is not one of the many interpretations of Darwin's thought over against its subsequent misusers. As a matter of fact, neither his thought nor the theory of evolution is systematically explained and interpreted, and this may be one of the limitations of Midgley's argument. When she says, for example, that the pattern of an escalator proceeding upwards from lifeless matter to humanity "is quite incompatible with regular Darwinian scientific theory" (p. 34), the reader may well agree with her, but not without asking on what grounds she makes this assertion. Darwin, in this case, functions as a source of authority for sound scientific judgments and as a model for healthy self-criticism and self-restriction.

If we try now to understand her standpoint by resorting to Loren Graham's categories of *restrictionism* and *expansionism* (see his *Between Science and Values* [New York: Columbia University Press, 1981]), we may see more clearly the difficulties presented by her argument. At a first glance she is a restrictionist: "It is the myths, not real biological theory, which have associated our evolutionary origins with injustice and oppression" (p. 8). She is in fact everywhere attacking the mythologizing process that infests science, for the sake of science itself, and judges passionately almost every attempt done today to get meaning out of facts, prescription out of description, future forecasts out of causal inferences. On the other hand, however, she plays an expansionist when criticizing those who restrict intelligence, knowledge, and thought to science only (see chapter 11, "Scientific Education and Human Transcience"). In the very first chapter, moreover, she constructs a fine argument that it is inevitable that dramas eventually emerge out of any broad-range theory: "Symbolism . . . is essential. Facts will never appear to us as brute and meaningless; they will always organize themselves into some sort of story, some drama" (p. 3). She adds that what has to be evinced and criticized are the "distortions" of this process of organization, not the dramas themselves. But she engages so earnestly in the task of chopping down the conceptual and moral jungle represented by these distortions (the word "confusion" appears very often throughout the book), that the resulting pieces pile up and the undistorted dramas are eventually buried. She does cite Albert Einstein and Theodosius Dobzhansky as examples of good dramatizers, but it is really unfortunate that their thoughts are not explicated in depth.

Perhaps there is some confusion between the pre-moral and the moral levels of analysis. Why pass moral, even harsh, judgments on all these authors and trends of thought—such as calling them "pseudo-scientific superstitions" (p. 65)—if the distortions inevitably appear in the scene? The same question applies to her explanation of why "smaller scientists" stick to these "bizarre world-views" (p. 134). Are not most of us "smaller scientists"? She seems to have missed a golden opportunity, moreover, thoroughly to apply her own prescription of "thinking historically" (p. 24) when analyzing the dramas and myths of modern science. She does imply, but does not expand on the point, that theories and other scientific constructions, once they are born, become historical facts. As such, they are neither under the strict control of scientists, nor can their fate be judged solely by moral categories. "The sentence before the trial" is not a prescription that can be applied here. "Good" and "bad," therefore, are not absolute labels that can be ascribed to a certain trend of

thought once and for all, as if the wheat and the weeds were possible to be separated by pure philosophical analysis.

The book has an ambiguity of another sort. Judging by the absence of technical jargon and the choice of authors and works to be analyzed, this book seems to be written for the general public. But the average reader may become lost in the lack of a clear rationale guiding the sequence of chapters or good summaries of each standpoint analyzed, and lastly by the subtleties of the philosophical reasoning. On the other hand, by trying to work in the spirit of Darwin, and for the sake of "good science," the author seems to be addressing her academic colleagues. The specialist, however, may be disappointed by the partisan tone of her reasoning and by the absence of empirical sources (for example, about the current status of the theory of evolution) and clear definitions of important concepts (myth, for example) which could substantiate the argument and provide common ground for discussion.

Despite these drawbacks the book is worth reading, not only for its many insightful assertions (see, for example, the discussion contained in chapter two, "Do Science and Religion Compete?"), but also for Midgley's many opportune indications of the limits and pitfalls present in the process of conveying meaning in a world of facts. She seems to be well acquainted with the topic of the book, treating with confidence and ease highly complex issues covering a wide range of subject-matters—the soundness of the argument does not seem to be jeopardized by its judgmental tone. For the readers of *Zygon*, who are particularly interested in seeing further correlations between science and religion, Midgley's analysis is welcome.

EDUARDO R. CRUZ
Assistant Professor of Theology
Pontifical Catholic University of S. Paulo
S. Paulo, Brazil