

Reviews

The New Faith-Science Debate: Probing Cosmology, Technology and Theology. Edited by JOHN M. MANGUM. Minneapolis: Augsburg Fortress Press and Geneva: World Council of Churches Publications, 1989. 165 pages. \$9.95 (paper).

This book represents a significant effort by a major group of Christian churches to address itself to the scientific and technological reality that permeates contemporary life on the planet. The volume includes lectures, spiritual meditations, and reports of group discussion (discussions were organized according to continents). These materials are the legacy of an international consultation sponsored in 1987 at Larnaca, Cyprus by the Evangelical Lutheran Church in America and the Lutheran World Federation. The latter, a federation of some 75 million members, is the third largest international community of Christians, after the Eastern Orthodox churches and the Roman Catholic church. Ecumenical in composition, this consultation included forty-five scientists, technologists, theologians, and church leaders from seventeen different countries in Africa, Asia, Europe, and North and South America. The authors represented in this book range, for example, from Bengt Gustafsson, professor of theoretical astrophysics at the University of Uppsala, Sweden to Deborah Enilio Ajakaiye, dean of the natural sciences at the University of Jos, Nigeria; from Paulos Mar Gregorios, metropolitan of Delhi, Orthodox Syrian Church of the East and a president of the World Council of Churches to Judith Larsen, senior scientist at DataQuest in silicon valley, California and Vitor Westhelle, who was at the time of the conference completing several years as parish pastor in one of the most economically depressed areas of Brazil (he is now professor of theology at the Escola Superior de Theologia in Sao Leopoldo, Brasil).

Why should a book like this receive attention from a journal like *Zygon*? Chiefly because it represents one response (though it is informal and not "official") from a significant concrete religious community to the issues posed by science and technology. Since this journal has through the years insisted that religion ought to attend to these issues, a book like this one will appear as an obvious move in the dialogue that we seek. Obviously one review cannot take account of all the emphases—even the major ones—in a multiple-author work such as this one. The significance of the volume as a whole will occupy our attention.

Three issues emerge from the book which persons both inside and outside the Christian churches will want to ponder. First, the sense of urgency that this volume articulates is unmistakable. This urgency is expressed on many fronts: the call to reshape traditional Christian doctrine; to initiate dialogue at all levels between the scientific, technological, and religious communities; to deal with the political and economic impact of science and technology; to insist that First and Second World domination of science and technology be criticized in light of Third World situations; to underscore the threats to planetary survival; to awaken the churches to the significance of this conference's concerns.

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Second, the diversity that marks the persons and the concerns of this volume cannot be overlooked. The diversity is not limited to one or two areas. There is high sophistication (such as that which probes the significance of Hartle-Hawking cosmology for understanding God) as well as utter simplicism (the apparent views of several writers that science and technology are monolithic and that they singlehandedly can be forces for good or for evil, as if there were no constraining societal framework). This sort of diversity cuts across geographical location, but one hopes that as the churches' dialogue with science and technology processes everyone will become less naive.

There is a general diversity, however, stemming from geography. North American and European writers tend to emphasize the conceptual issues between scientific and theological understandings of the world (Arthur Peacocke: "The importance of *ideas* cannot be overestimated" p. 22). Thinkers from other continents move in the direction of ethical issues and societal impact (Westhelle, describing his situation in Brazil: "The point is that although you don't have an option for life any more, you still don't die. You are killed. If theology is not concerned with this question, all the rest is futile" p. 24). The North Americans and Europeans seem to be less concerned with the urgency of the need to control the power of science and technology and the societal dislocations which that power causes than the writers from the rest of the world. The reports at the end of the volume stemming from the regional discussion groups are particularly enlightening on this diversity.

The relation of science, technology, and society is perhaps the major issue raised in this book. It is not, however, raised in a very full and sophisticated manner. Generally, the Northerners who deal with the issue take a much more relaxed posture, tending to abstract science and technology as if they were agents who conspire in isolation from the rest of society and its forces. The reasons for this would be worth probing, but they are too complex to analyze here. It seems clear that the more metaphysical interests of the Northerners must come to terms in a creative manner with the perspectives of the southerners, who seem more socially aware. At the same time, Ted Peters and Robert Russell (both U.S.A.) are certainly correct in their cautioning that the awareness of the implications of science and technology for power relationships in society ought not to become captive to an exclusively ideological and ethicistic interest that eliminates metaphysical concerns.

Theological diversity also marks this group. Harold Nebelsick (U.S.A., whose recent death was untimely and is much lamented) sees "science and technology as God-given instruments that, used correctly, extend our power for good" (p. 58), while German Gerd Leidke comes very close to equating science and technology with the acts of violence toward environment and humans that are often carried out with technological means. Ronald Cole-Turner (also U.S.A.) takes a more dialectical view that would in principle allow for genetic engineering to be a means of our co-creating with God—even though his sober assessment leads him to say, "I am not optimistic that much of what will happen in the future in genetic engineering can be dignified theologically with the label 'co-creation.'" The Christians in this volume are typical of the world-wide Christian community in that they do not speak with one theological voice.

Finally, there shines through the essays in this book what one would expect from religious persons: a predominant concern for the deep significance of science and technology in our age. More than the specific assessment of particular developments, even more than the urgent concern for specific

abuses and dangers, these church persons are pushing to the level of asking "What does it all mean?" In this they are contributing what society most desires from the religious community. This is the most difficult thing to contribute, since it transcends the particular competencies and analyses upon which it depends, and it does not automatically emerge from education and experience. This book does not, as I am sure its authors would agree, go nearly far enough in answering what the deep meaning of science and technology is. It does merit the closest scrutiny and critique so that its authors and their communities can sharpen their contribution.

A fitting conclusion to this review is the voice of one participant who speaks courageously to the question of what science and technology really mean for us. From Metropolitan Gregorios: "Science/technology is a part of the means by which becoming a human being takes place. [It] is not that we human beings somehow become exactly like God. It is that we who embody the whole creation and are the priests of creation take the created order and shape it to show forth the glory of God. Science and technology are central [to this]" (p. 122).

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The Social Meaning of Modern Biology—from Social Darwinism to Sociobiology. By HOWARD L. KAYE. New Haven: Yale University Press, 1986. 224 pages. \$20.00.

The very title of Howard Kaye's book—*The Social Meaning of Modern Biology*—has a seductive appeal to it that is well-nigh irresistible to participants in the science-theology dialogue. A quick scanning of the table of contents, the list of references (from Arendt and Avery to Waddington and Wilson), and the index (including Bronowski, Bohr, Darwin, Dawkins, Delbrück, Dobzhansky, Haldane and Huxley [J. and T. H.], Schrödinger and even Teilhard to name-drop but a few), and one is sold on the impulse to add this one to the collection of essentials in the anthology/scholarly-comment section of one's own library on the epic of creation and the shapes of life. Alas, one soon discovers what a blunder of a choice, when so much could have been told from the materials at hand! The dismal message that Kaye brings to the reader is that "the writings of the molecular biologists reflect quite a break with and hostility toward what they variously term 'Christian,' 'Western,' or 'literary culture'"; and that "for these molecular biologists, ethologists, and sociobiologists, the human mind and human culture, which had hitherto been viewed as our liberation from the tyranny of natural selection . . . are now our oppressors" (p. 160). The book is almost a polemic in its relentless claim that some of the leading figures of modern biology have "scientized" an apocalyptic view of life whose "ultimate harm . . . may lie more in the unintended dehumanization it may encourage than in any crypto-Nazi movement it may spawn" (p. 164); and further, that these gloomy new perspectives have been formulated unscientifically, through the habitual "transformation of science into myth," along with uncritical philosophical reductionism that serves "scientific-looking" visions of apocalypse by "anthropomorphizing macromolecules" (p. 75) and the evolutionary process.

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Professor Kaye addresses five main stages in the development of his thesis: (1) social Darwinism and the failure of the Darwinian revolution; (2) from metaphysics to molecular biology; (3) from molecular biology to social theory; (4) sociobiology and the natural theology of E. O. Wilson; and (5) the popularization of human sociobiology.

In advancing his theme, Kaye resorts on occasion to the use of mini-biographical sketches of his central figures. They emerge as bright, god-like, strident, slick, even mercurial figures as the plot of this extraordinarily *ad hominem* psychodrama of molecular biology thickens. Thus we learn (if we didn't already know) that Jacques Monod (a later target of Kaye's for Monod's lapses into metaphor in *Chance and Necessity*) is descended from a Calvinist clergyman born in Geneva whose family had been forced to flee France with their fellow Huguenots following the revocation of the Edict of Nantes in 1685. Monod's father was a positivist whose interest in Comte, Mill, Spencer, and Darwin exerted an enormous influence on his son's intellectual development. And as a graduate student at Cal Tech in 1936 he spent more time conducting Bach than in doing genetics experiments in Morgan's lab! And so on. "Monod does not simply describe DNA's function; he rhapsodizes upon it" (p. 73). Kaye goes on to charge that, "in keeping with the anti-anthropomorphic basis of modern scientific thought," (p. 75) Monod tries to banish mind and purpose from the phenomenon of life at the organismic level—while at the molecular level he hypocritically resorts freely to the use of such scientifically gratuitous anthropomorphisms as "cognitive faculty" and "chosen structures" (p. 75). Finally, "by anthropomorphizing macromolecules" (DNA and proteins) and mechanizing organisms as "self-constructing; machines obeying the dictates of their genetic programmes," Monod is "speaking myth without knowing it" (p. 75).

Kaye has similar problems with E. O. Wilson's declaration that "altruism" is the "central theoretical problem of sociobiology" (p. 101) and with Dawkins's "myth of the selfish gene" (p. 141). Even the liveliest of these personal anecdotes and analyses of logic are far from flawless, and some are indeed so bizarre biographically and scientifically as to call for rebuttal. Finally, the central figures of these psychodramas, from the god-like to the mercurial, seem to be set up as strawmen to be set aflame, and as icons to be elevated and then toppled to service Kaye's ultimate message of gloom.

To end this review on a more upbeat and optimistic note, let me suggest that this subject area richly deserves being revisited, to include next time not only references to the relevant works of Jacob Bronowski and Pierre Teilhard de Chardin, but also to give credit to the equally relevant perspectives of George Wald, Van R. Potter, Ralph Burhoe, and a host of others, conspicuous by their absence from references or index. Correcting such errors of commission (disregard for the resurgence of interest in Teilhard's scientific contributions, insufficient analysis of the contributions of Bronowski, Dobzhansky and Huxley) and of omission (absence of Van Potter's breakthroughs into bioethics) will leave us with a more balanced perspective on the social meaning of modern biology.

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A Brief History of Time: From the Big Bang to Black Holes. By STEPHEN W. HAWKING. New York: Bantam Books, 1988. 198 pages. \$18.95.

"What did God do before He created heaven and earth? He prepared eternal punishment for those whose audacity wants to explore the abyss of His secrets." This quotation from St. Augustine has recently attained unexpected popularity. All major German periodicals have mentioned this joke, from which St. Augustine disassociated himself in his reflections about time in the eleventh book of his *Confessions*. Even more astonishing is the fact that the question "Does God exist?" was a title article of *Der Spiegel*, the largest German weekly news magazine. The media's discovery of time and its relationship to the question of God's existence is due to a physicist who has suffered from amyotrophic lateral sclerosis (Lou Gehrig's disease) for years, is bound to a wheel chair, and can only communicate with others through the help of a computer and voice synthesizer. Despite these handicaps, the 46-year-old Stephen Hawking is one of the most famous and most creative physicists of modern times, holding Newton's chair as the Lucasian Professor of Mathematics at Cambridge University. His new best-selling survey of modern cosmology, *A Brief History of Time*, has made him well-known to a broader spectrum of the public.

What is so new about Stephen Hawking's description of the world from the perspective of theoretical physics? Up until recently physics was in agreement about the scenario at the beginning of our universe. (Here we shall only be concerned with this beginning.) Ten to twenty billion years ago our universe came into existence as a result of the so-called "Big Bang." Everything we observe in the universe today from the smallest subatomic particle to atoms, molecules, living creatures, to human beings, developed from a single point of infinitely hot and dense matter, considered until now to be a singularity. That is, previous to the Big Bang, the laws of physics in their mathematical expression could not apply. For physics, having discovered a singularity meant that here the laws of nature and their ability to make assertions ended. Accordingly, space and time started with the Big Bang; the universe had an absolute beginning.

That such an absolute beginning of the universe along with the singularity defying all scientific explanation could lead to introducing a God of creation at this point is understandable. And so even Hawking wrote that one could still imagine that God created the world in the instant of the Big Bang. The model of an expanding universe would not exclude a Creator, but it would restrict the point of time at which He could have performed His task. To what extent equating the Big Bang with God's act of creation was in fact advocated by theology and how problematical this view now is, remains to be investigated.

In the 1970s Stephen Hawking took up the task of questioning more precisely whether a singularity must precede the Big Bang. Was there not some other way to discover what happened before the Big Bang? What was before the beginning? Today modern physics describes the universe on the basis of two fundamental theories: the general theory of relativity and the theory of quantum mechanics. The general theory of relativity describes the large-scale structure of the universe and provides the basis for the Big Bang model. The theory of quantum mechanics describes those forces which operate at the sub-

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atomic level. The main problem in reconciling the two theories is that "they can't both be right." This is the point at which Stephen Hawking begins. He is trying to combine both theories into the Grand Unification Theory, a search for the universal formula that will explain everything. And he believes he has found hints pointing toward his theory. The first results are so revolutionary that for many the question of God's existence seems to be affected by them.

Hawking developed the "suggestion" of a finite space-time without boundaries. According to this theory the Big Bang model (with a different "kind" of time to be sure, as defined by Hawking) would continue to be valid—with one difference: the Big Bang would no longer emerge from a singularity. Hawking's hypothesis makes the beginning of time starting with the Big Bang questionable. According to his theory, it is nonsense to continue to speak of a beginning of time or a beginning of space. The surface of the earth can serve as an analogy—finite in its extension but unbounded. There would be no singularity at which the laws of nature lose their validity, no boundary of space and time at which one would have to call for God or some law in order to set conditions for space and time. And now Hawking draws two conclusions which are important for theology: the universe would be completely contained in itself and not dependent upon any outside influences. It could not be created or destroyed. It would simply BE. Hawking asks the critical if overzealous question: Where would there then be room for a Creator?

At first glance such a theory could give the impression that Hawking was trying to prove the non-existence of God mathematically. Yet Hawking himself rejects such an interpretation, which *Der Spiegel* wanted to put into his mouth during an interview. He did not want to provide a proof that God does not exist. His theory only meant that "God wasn't necessary." In addition, certain limitations on Hawking's theory must be noted. He characterizes his theory as merely a suggestion, which cannot be derived from any other principle. Further, a verification of his theory based on observed data will scarcely be possible. Hawking's theory is still far from being proven knowledge in natural science.

Although Hawking's theory is not yet an accepted theory of natural science, theology, if only in view of the public interest, cannot avoid this topic. What rank and value does a physical definition of time have within the theology of creation? Can God be just as easily recognized as a Creator in a creation with without a beginning in time as with one? These questions lead back to the thirteenth century, when theology had to come to terms with the newly rediscovered ideas of Aristotle and therefore also with the temporal infinity of the world. Concerning the question of the beginning of time in the world, Thomas Aquinas did not expressly oppose Aristotle's world without a beginning. He merely stated that neither the infinity of the world nor the temporal beginning of the world could be demonstrated. Therefore the decision could only be made in faith. And here Aquinas of course, with most of his contemporaries, assumed that the biblical concept of creation was bound to a beginning of time. This opinion, which the Fourth Lateran Council supported, held up until the present time. In 1967 an important handbook for dogma stated: "What would be a mere possibility or probability for philosophy is a necessity for theology. . . . God must have created the world . . . as a world with a beginning of time."

Must, therefore, Stephen Hawking's theory of a universe without a beginning of space and time mean a refutation of the Christian belief in creation? Let

us attend to still another branch of tradition, which can very well conceive of a creation together with an infinite duration of the world. Besides Justin in the second century, who was able to accept even uncreated matter, Aquinas (and also the above-cited handbook) showed his openness to the idea of a temporally unbounded world. For Aquinas it was merely somewhat more difficult to recognize the Creator in the creation, if the world always was, rather than if it had a beginning. It was clear to him, however, that the possibility of a creation remains untouched by the question of its temporal beginnings. And even the Fourth Lateran Council with its formulation of "God creating the world 'at the beginning of time'" did not want to issue an actual definition of faith. The handbook also admits the possibility that the idea of creation is independent of the problem of the age of the world.

The current situation is nevertheless changed from earlier centuries since today the theology of creation is no longer opposed by philosophical speculation about the infinity of time (Aristotle) but rather by the efforts of theoretical physics to prove this thesis. Therefore the statements of dogmatists after the Second Vatican Council—which tried to save face by claiming that natural science would very likely never be able to make a clear statement in this question—are no longer relevant. Likewise, the spontaneous false conclusion that the Big Bang coincides with creation does not end the matter. This (at least implied) statement of Pope Pius XII in 1951, which physicists enjoy quoting, has nothing in common with the classical theology of creation, according to which the creation out of nothingness was never pinned down in terms of space and time. Augustine had already understood that God did not have any matter in His hands out of which He then formed heaven and earth (*Confessiones* XI, 5).

Where then is the answer to Stephen Hawking's question? Must new knowledge from the realm of natural science once again force theology to withdraw from a field which it previously regarded as its own—which, however, now has fallen within the range of science? Or can theology also make a contribution to the new questions about the existence of God in a universe without the boundaries of space and time? Stephen Hawking and other physicists, among them Paul Davies, have recognized that even in a universe without a temporal beginning, the question of the existence of God has not simply become meaningless. On the contrary, it would appear that the question of God's existence has only become much more urgent, now that the simple solutions, such as equating creation with the Big Bang, no longer work. The question as to why the universe exists at all and why it was created and constituted in precisely this way still cannot be answered by any theory of physics, no matter how grandly unified. There is also Stephen Hawking's admission that while he believes we have a good chance of discovering the laws which rule the entire universe, that still would not give us an answer to the question: Why does the universe exist?

My thesis is: the discussion about Stephen Hawking's universe can lead us to a more purified and a clearer belief in creation. Faith in a creation from nothing does not only mean that God created the world, but rather that He created it in a way that is fundamentally beyond human comprehension of creating and making. Creating from nothing does not mean making something from something else, which Augustine and Aquinas recognized. The only difference was that both of them wanted to cling to the belief that God created the world with a beginning of time. This beginning of time could now be in doubt, if Stephen Hawking should be proven right.

And yet not only must theology change its way of thinking; physicists like Stephen Hawking who believe their models of the universe have left no room for a Creator must understand that a Christian theology of creation cannot be fundamentally disproven by physics. For God's act of creation can in no way be compared with actions and reactions within the created universe. That we nonetheless depend on such analogous speech is a function of our own human finitude. The recognition that all theological statements can only be analogous statements must also be valid for the sentence "God created the world out of nothing." As the Fourth Lateran Council stated, the dissimilarity of these words with God is always greater than the similarity.

Theology need have no fear of knowledge from natural science, for such knowledge can only help. Theology should not insist, however, on clinging to traditional statements which have to be regarded as disproven by natural science. How did Aquinas put it? "A mistake about creation brings about a false knowledge of God (*Summa Contra Gentiles* II, 3). Therefore we should accept the traditional methods of integrating contemporary knowledge into theology in order to come closer to God. However, we should not try to defend attempted explanations which are mere products of their times, if the contents have long since been superseded by the progress of science.

If even the media have discovered that the questions of modern physics have something to do with the question of the existence of God, then theologians should also attempt to read about God in the "book of nature." The question as to why the universe and therefore human beings exist at all is a theological question. But it can only be answered adequately at the present time if it is approached from the horizon of our available knowledge. That this question is being asked anew by physicists like Stephen Hawking makes theology exciting once again.

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