

Reviews

Fundamentalisms Observed. Edited by MARTIN E. MARTY and R. SCOTT APPLEBY. Chicago: Univ. of Chicago Press, 1991. xvi + 872 pages. \$40.00.

Fundamentalism, to students of science, evokes images of the half-feral hill people observed in the wilds around Dayton, Tennessee, by H. L. Mencken in his reports on the Scopes "monkey trial." In a modern context it calls up the disgraces of television evangelists and the excesses of the Islamic revolution in Iran.

Fundamentalisms Observed, the first of a projected six volumes in The Fundamentalism Project, presents a welcome corrective to these prejudices. In fourteen essays, sixteen scholars address different fundamentalisms, providing both brief historical accounts and analyses of the movements' contemporary memberships, beliefs, and goals. The movements discussed include Protestant fundamentalism in North and South America, Roman Catholic traditionalism in Europe and North America, Judaism in Israel and North America, Islamic fundamentalism from the Sudan to Malaysia, Hindu and Sikh movements in India, fundamentalist trends in Theravada Buddhism and the Confucian revival in the Far East, and Japan's New Religions. Though, as the editors note (p. 814), many other movements could be considered "fundamentalist," the volume's range is impressive. Particularly interesting to those who associate fundamentalism with the three monotheistic, scriptural religions are the accounts of Hindu, Buddhist, Confucian, and New Religion fundamentalisms.

Each of the essays can be read on its own, and the authors have included short bibliographies of works for further investigation. But, according to the editors, the purpose of the volume was also to elucidate the common traits of a "hypothetical 'family of fundamentalisms'" (p. 816). These traits include religious idealism as "an irreducible basis for communal and personal identity"; the vocal rejection of secular culture; "dramatic eschatologies" shaping behavior and beliefs of fundamentalists; the mythologization of their enemies in terms of these eschatologies; and mass appeal (pp. 817-20, 830). They are careful to point out that not all movements display these trends, and they want to develop a typology of fundamentalist movements in order to avoid lumping them together.

The idea of a typology of fundamentalisms is intriguing, and it will be interesting to see how it is developed in further volumes in the series. But the historical emphasis of all of the essays leads me to question the usefulness of a detailed typology. Since fundamentalist movements tend to take form in response to specific historical circumstances, will a typology do more than codify the circumstances which produced each movement? Such a typology, which would present the results of contingent historical events as ideal structural characters, would do more harm than good. As a historian, I am more tempted to envision a set of historical generalizations about the

[*Zygon*, vol. 28, no. 1 (March 1993).]

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development of fundamentalisms. Such generalizations could be related to a typology as a series of conditions conducive to generating fundamentalist types.

Given the opposition of Protestant fundamentalists to the theory of evolution, amply documented in Nancy Ammerman's essay, one is tempted to view science and fundamentalism as opposed forces. Certainly a number of the movements discussed here are antiscientific and anti-intellectual. T.N. Madan, writing on the Sikh traditionalist movement, claims, "In principle, the modern secular and rational weltanschauung is opposed to any religious worldview" (pp. 619-20). Madan himself notes that the Sikhs—like many other fundamentalists—are more pragmatic; they use science and technology "in the limited context of their own needs" (p. 620). Other movements challenge the theoretical validity of Madan's generalization. A number of the movements discussed either have no opinion on science or use it to their own religious ends; Gideon Aran cites a Jewish fundamentalist project to genetically engineer the sacred red heifer (p. 318). And as the editors note, fundamentalists in all parts of the world seem to have an instinctive grasp of how to use the highly technological modern mass media effectively (p. 832).

A number of the movements emphasize, however, that science, to be truly compatible with their religion, needs to be assimilated to it. In the case of North American Protestants, the approach to science is to restore an ideal past in which Baconian science led to an appreciation of God's design. Other societies, with no indigenous history of scientific activity, perceive the problem in other terms. Islamic fundamentalisms point to the historical reliance of Western science on Islamic scholarship (p. 357) and to the necessity to re-Islamicize science (p. 488). The Jamaat-i-Islami, a fundamentalist movement in Pakistan and India, claims that "Muslim societies must strive toward the development of an autonomous science and technology of their own" (p. 509).

Thus, what conflict there is between science and fundamentalism is localized and focused on specific issues or part of a general anti-intellectualism, as seen in some South American Protestant fundamentalist movements (p. 179). Other conflicts are not with science per se, but with the aspects of "modernity" which fundamentalism opposes.

Marty and Appleby, following the tone of most of the essays, see fundamentalisms as being formed primarily through *reaction* to the complexity and uncertainty of the modern world. Marty and Appleby define fundamentalisms, in part, as "movements of radical reaction to postcolonial modernity" (p. 815). Winston Davis defines fundamentalism as "a pattern of coping with unbalanced social and cultural development by means of 'symbolic regression.'" Fundamentalism therefore is by definition a reaction to modernization, although it is not necessarily a complete rejection of modernity as such" (p. 784). Other authors make similar assertions that modernity is a force that produces fundamentalisms.

For North American Protestants and Catholics, the struggle against modernity is occurring within their own culture. For much of the world, however, "modernity" means specifically the Western, rational worldview which was introduced through nineteenth-century colonialism. Thus, responses to a pure "modern mentality" are mediated by hostility to colonialism. According to John Voll, the roots of modern Egyptian

fundamentalism lie in “the response of urban, educated youth to the unmistakable intellectual and moral crises created by the rapid introduction of Western ideas and technology” (p. 355). These responses often take a double form: a rejection of modern Western ideas perceived as contradicting fundamentalist tenets, combined with a desire to assimilate those Western ideas which are not so contradictory—while purging them of Western associations. This specifically anticolonialist aspect of the fundamentalist response to modernity is not given enough weight by Marty and Appleby, although the authors of individual essays treat it sufficiently when warranted.

But to say that fundamentalisms define themselves in response to “modernity” is tautological, unless one can define specific aspects of modernity to which fundamentalisms are reacting. This is especially important given that many fundamentalists accept, and even embrace, aspects of modernity not opposed to their “worldview”—e.g., technology (p. 218, Heilman and Friedman). Fortunately, a number of patterns in fundamentalist responses to modernity emerge from these collected essays.

The most interesting to students of science and religion is the fundamentalist view of truth, which rejects the subjectivity and relativism typical of some modern epistemologies. Not surprisingly, it concentrates on the importance of revealed knowledge. Scriptural inerrancy plays a large doctrinal role from North American Protestantism through organized Hinduisms and, perhaps most notably, the Sikh fundamentalist movement, which has made the Sikh holy book into its actual guru (p. 599). Four of the six nonscriptural religious traditions discussed here have important scriptural foci in their fundamentalist incarnations. This view of scriptural inerrancy and revealed truth shapes the fundamentalist view of all forms of knowledge.

The other main fundamentalist objection to modernity is the secularizing, fragmenting aspects of modern life. Marty and Appleby point out, following a number of authors, that “fundamentalists seek to replace existing structures with a comprehensive system emanating from religious principles and embracing law, polity, society, economy, and culture” (p. 824). Just as all knowledge is one, so all society must be one, and it must operate according to religious principles. For this reason, a number of fundamentalist movements, especially in the Muslim world, are allied with or part of nationalist movements; this alliance also points to the anticolonialism of many fundamentalisms.

But if fundamentalism takes shape in response to modernity, it does not blindly appeal to tradition. Fundamentalism is “selectively traditional and selectively modern” (p. 825). “The privileged past is defined with a keen eye on the particular challenges of the present and the opportunities of the future” (pp. 825–26). This is, of course, a feature of all traditionalist movements; the past provides far too many options for one to abstract a pure, nonideological version of “tradition.” Rather, fundamentalisms employ decontextualized doctrines as “ideological weapons against a hostile world” (p. 826). Indeed, Ammerman argues convincingly, the entire Protestant fundamentalist social “tradition”—its emphasis on the nuclear family with the father as wage earner and the mother as homemaker—was a creation of late nineteenth-century industrialization. Fundamentalist “traditions” are very carefully chosen from the range of alternatives in order to oppose specific aspects of modern secular society.

But there is a further dimension to the relationship between fundamentalism and modernity. "In the strategies and methods these leaders adopt in remaking the world," the editors remark, "fundamentalists demonstrate a closer affinity to modernism than to traditionalism" (p. 827). This is not true of every fundamentalist movement; the Haredim, for example, are "passive traditionalists" who prefer to insulate themselves from modernity rather than attempt to change it. But a number of movements, particularly those with political aims and arms, attempt to use the methods of modern secular democracies to impose antimodern views on them. As I note above, they effectively employ modern media technology to this end.

While the analysis of fundamentalisms and modernity presented by the editors in their conclusion is interesting and provides ground for fruitful speculation, in the end it is, due to the structure and purpose of the volume, only a preliminary sketch. In the absence of the typology of fundamentalisms desired by the editors, the relation between fundamentalism as a tendency and modernity remains to be untangled. The accounts offered in the individual essays are far more successful, since they concentrate on the specific historical and cultural circumstances bearing on the relationships between fundamentalisms, tradition, colonialism, and modernity. One hopes that subsequent volumes in the series will take up these relationships in a more comprehensive and detailed analysis.

Fundamentalisms Observed deserves the attention of anyone interested in the relation between religion and society as well as the historical development and social structure of modern fundamentalist movements. Although its main strength lies in the individual accounts of fundamentalisms, the conclusion provides an initial basis for understanding fundamentalism as a general impulse, rather than a series of disconnected and only superficially similar movements. Though it will take further work to determine whether these general resemblances are mere coincidence or signs of deeper structural similarities, the work in hand demonstrates that the project is well worth undertaking.

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Kann Man Gott aus der Natur Erkennen?: Evolution als Offenbarung. Edited by CARSTEN BRESCH, SIGURD MARTIN DAECKE, and HELMUT RIEDLINGER. Basel: Herder Press, 1990. 174 pages. DM 36.00 (paper).

Is God recognizable in nature? This is the underlying question that ties together like a delicate cord this diverse collection of essays. The book was created by an interdisciplinary, ecumenical group of European scientists, philosophers, and theologians who, by jointly addressing this question,

[*Zygon*, vol. 28, no. 1 (March 1993).]

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have taken upon themselves the task of resurrecting the modern significance of "natural theology." Each writer approaches the central topic of the relationship between God and nature—that is, the topics of natural theology, natural revelation, evolution and God, and the natural knowledge of God—from the perspective of his own field of expertise. Helmut Riedlinger and Sigurd Martin Daecke are theologians; Herbert Gahmig is a chemist; Carsten Bresch is a professor of genetics; Béla Weissmahr and Viggo Mortensen are philosophers; and Günther Schiwy is an editor. The conclusions reached by this motley group of professionals and academics are, as one might expect, not only varied but discordant. Nevertheless, the genius of this book does not lie in any definitive group consensus concerning a possible resolution of the God-Nature problem, but rather in the methodological commitment of these interdisciplinary thinkers to reevaluate *together* this age-old question, and then to present the results of their dialogue in a concise and an engaging form.

This collection of essays is meant to be thematically diverse, intellectually challenging, and methodologically instructive. For the book not only presents the readers with the separate viewpoints of each respective expert, it also offers them as its concluding chapter the main impressions of a discussion which took place on 26 April 1989 on Austrian television (on the show "Disputationes" ORF-Fernsehen, Landesstudio Salzburg), where topics ranging from evolution to the existence of a personal God in the universe, from "the cosmic Christ" to the "Alpha-principle" of nature, were openly discussed and debated by this same group of experts.

Consequently, the editors and contributing writers of this book are trying to reevaluate the magnitude of the ancient question surrounding natural theology in a modern way. They are simultaneously proposing that their broad, interdisciplinary approach to the expansive terrain of natural theology is necessary and potentially the most fruitful method for making inquiry into such an intricate, many-faceted field of study. The essays in and of themselves may not be either ground-breaking in their respective fields or overly innovative. Placed together *im Gespräch*, however, these separate insights from the religious and scientific fields take on a fascinating propinquity that immediately challenges readers to broaden their horizons and their own parochial approaches to defining God's dealings in the world of nature. To the surprise of many, this book testifies to what more and more experts in these fields have already come to recognize as self-evident—that religion and science are more so fascinating, stimulating bedfellows than they are diametrically opposed rivals. Those who are interested in such an interdisciplinary approach between religion and science within the arena of natural theology, who likewise wish to follow the tenure of these discussions in Europe, and who read German, will find *Kann Man Gott aus der Natur Erkennen?*² a marvelous introductory work.

Now, even if the book is effective in raising anew the question of natural theology, one could nevertheless ask, But is this question still relevant? Is it really necessary to pose once again the question of God's existence within nature? One could with some justification ask whether these writers are merely rehashing old, outmoded questions that have long since been answered by most people with definitive answers of yes or no and then forgotten. Does this book represent just another inconsequential delving of a professional elite into matters which are of little or no concern to the

general public or even to their respective colleagues? What will theologians find within these pages, for example, which might move the debate beyond the Barth-Brunner forays for and against "natural theology" in the 1930s or the *Säkularisierungsthese* from Gogarten in the 1950s, which effectively separated God and faith from nature and reason? Furthermore, many theologians are immediately distrustful of scientists who make constructive, systematic statements about "theos" based on their "*Erziehung der Augen*" (Teilhard de Chardin), fearing an amalgamation of "creator" (*theos*) and "creation" (*physis*) without any serious endeavor to confront the traditional theological, religious, and cultic implications these affirmations might entail. On the other hand, many scientists might wonder what theologians, modern and/or premodern, could possibly hope to offer scientists about nature's evolution which might enhance, not diminish, the quality of those discussions. When evolution becomes revelation (Bresch), what further constructive role can theology play? Skepticism and mistrust, therefore, have often delineated the relationship between science and theology—at least on the level of general public discourse.

The introductory chapters by Sigurd Martin Daecke and Carsten Bresch make an attempt to address these questions from both the theological and scientific sides. They argue, albeit from very different perspectives, against the prevailing dualism, the schizophrenia, between the natural and the supernatural. They both argue forcefully that the "book of nature" must not be closed in understanding "revelation." In an age where the natural sciences play such a prominent role, questions surrounding "the natural knowledge of God" must not be condemned or stymied on account of old taboos. Helmut Riedlinger, a Roman Catholic theologian, points out that the Reformation was the culprit which led in Western Christianity to an open conflict between the supporters and detractors of natural theology. Riedlinger goes on to review the long and rich history of Greek, Jewish, and classical Christian dealings with the God-nature relationship. He refers repeatedly to the salient character of these "origins" of natural theology. He likewise underlines the influence these origins have exercised in the past on Christian theology and must continue to exercise on the Christian posture concerning natural theology today.

Bresch begins his short review of natural theology in the eighteenth century with the theologians Nieuwentyt, Derham, and John Ray and continues through to William Paley. To one degree or another, these "natural theologians" all supported the predominant four physiological arguments for a good and gracious creator-God. Bresch, however, sees in the movement and the human experience of evolution *the* primary "text" for understanding God. Evolution for Bresch is so definitive that all other religious texts and words pale next to it in revelatory power. The greatest mystery in this *Offenbarung der Evolution* (evolution as revelation) is the principle behind material substance being capable of life. This principle, what Bresch calls the "Alpha-principle," is the key to unfolding natural theology.

Herbert Gahmig follows the line of Bresch in understanding evolution as natural revelation. His essay is an attempt to present a supportive argument, or at least an initial proposal, based on chemical properties and laws of reactions, for certain principles of the evolution of material substances. But are such scientific proposals merely a retreat into materialism? Béla Weissmahr submits that the natural sciences must not neglect "freedom"

as an intrinsic element in the process of evolution. And freedom, in the opinion of this author, ultimately leads to the idea of an Absolute, which raises the question of "God." The discussion comes around full circle with Schiwy's article on "the cosmic Christ" in the work of Teilhard de Chardin and even Daecke's use of the Trinitarian understanding of God as an effective way, at least within theological circles, of affirming a picture of God in which immanence and transcendence, the natural and the supernatural, are not totally dissected but united. Viggo Mortensen supplements the aforementioned discussion with the affirmation that any reconstruction of natural theology is only possible on the foundation of a new metaphysics and a new ontology. He then proceeds to list thirty guiding theses to help this new, interdisciplinary project of redefining natural theology to clearly understand its goals, expectations, and limits.

Daecke and Bresch set the tone for the entire book by affirming the necessity of natural theology. It was Bresch, along with his university colleague Helmut Riedlinger, who began in 1983 to raise questions concerning natural theology within the framework of interdisciplinary seminars which they held together at the University of Freiburg. On this methodological point, at least, all authors appear to be in perfect unity. But how and to what degree evolution reveals God, or what kind of "god" nature reveals, or whether "natural revelation" is more or less reliable in revealing God than "word revelation," remain genuine articles of disagreement and contention.

Interdisciplinary inquiry is certainly a necessary, if not a sufficient means, to approach the topics of evolution, nature, God, and revelation. As this book adequately shows, this debate has progressed far beyond the old questions of evolution making God superfluous or faith making scientific inquiry a mark of disbelief. The essays, if achieving nothing else, will force readers to deal with areas of the natural theology debate with which they have never before been confronted. That is the point.

The real mark of this book, however, is the concise manner in which the at times very technical and diverse material is successfully presented as one whole work. Certainly, such a qualified, accessible, readable book—if it were translated into English—could prove to be a great aid in presenting the multifaceted universe of natural theology to a diverse audience from a similarly diverse assembly of sources.

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Uncertainty: The Life and Science of Werner Heisenberg. By DAVID C. CASSIDY. New York: W.H. Freeman, 1991. 669 pages. \$29.95.

Werner Heisenberg is one of the very few twentieth-century scientists whose name is recognizable by all educated people. He was born in 1901 into a German middle-class academic family. It was a home in which there was strong encouragement to compete for excellence and in which a university professorship was seen as the crown of achievement. At the gymnasium the young Heisenberg attained the highest grades, with mathematics, physics, and religion as his best subjects. His later school days were disrupted by the closing stages of the Great War and the turbulent aftermath of revolution and counterrevolution which swept through his native Bavaria. He became the leader of a group of boys (the "Gruppe Heisenberg"), which pursued a Boy Scout kind of life together by means of expeditions into the Bavarian countryside. The friendship of these companions and their acceptance of his guidance were important factors in his growth and development.

In October 1920, Heisenberg entered the University of Munich to study under Arnold Sommerfeld, one of the greatest teachers of theoretical physics that Germany has ever produced. There he met the sharp-tongued Jewish physicist Wolfgang Pauli, who became a lifelong stimulator and critic of Heisenberg's thinking in physics. Even as a gymnasiast, Werner had been impressed by the ability of mathematics to interpret the physical world, which "struck [him] as remarkably strange and exciting" (p. 40). Heisenberg's doctoral dissertation was concerned with the onset of turbulence in fluid motion and (owing to his cavalier attitude to experimental physics, which upset Wilhelm Wien, who was one of his examiners) he only graduated cum laude. Yet Heisenberg's real interests were in the puzzling area of quantum physics, stimulated by visits to Göttingen, where he worked with Max Born and heard lectures by Niels Bohr. In 1925 came the big breakthrough. Recuperating on Heligoland from an attack of hay fever, Werner produced the first articulated formulation of a satisfactory quantum theory in his paper about matrix mechanics. In 1927 there followed Heisenberg's most celebrated piece of work, enunciating the uncertainty principle. It is curious to reflect that, when this founding father of quantum mechanics was awarded his Nobel Prize in 1933, it was officially for rather technical work on the properties of hydrogen molecules.

The young Heisenberg was self-confident and ambitious. David Cassidy detects in him a strongly pragmatic streak, with physics seen as the art of the soluble. "Born of brilliance, ambition and youthful ignorance and independence, boldness remained with Heisenberg throughout his career and distinguished his audacious, intuitive style of physics from the more cautious, traditional, and rational approach of most of his colleagues" (p. 124). There was some rivalry between Heisenberg and Erwin Schrödinger, whose slightly later wave mechanics provided a more transparent and readily usable version of quantum theory. Yet when Werner wrote his widely influential book *The Physical Principles of the Quantum Theory* (Chicago: Univ. of Chicago Press, 1930), he made many mentions of Bohr but none of himself.

[Zygon, vol. 28, no. 1 (March 1993).]

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With the 1930s came the rise of Nazism. Heisenberg was deeply committed to his country and never seriously contemplated leaving Germany. In the face of Hitler he was neither a supporter nor a protester. The elderly Max Planck counselled keeping a low profile, dissociating academic culture from involvement in the rough world of politics. In 1935 Werner wrote to his mother, "The world out there is really ugly, but the work [science] is beautiful" (p. 330). However much one tried to keep one's head down, a man of integrity could not forever escape attack. The dark figures of Phillip Lenard and Johannes Stark proclaimed a campaign for "Deutsche Physik." They attacked "the theoretical formalist Heisenberg, spirit of Einstein's spirit" (p. 350). The humiliating compromise of speaking of relativity without mentioning its discoverer was forced upon Werner and his colleagues.

The biggest question mark over Heisenberg's relations with the Nazi regime relates to the war years and the German atomic program, of which he was certainly a leading light. Were Werner and his colleagues driven by the exigencies of war to do all they could for their fatherland, or did they deliberately restrict the program to the construction of an energy source (a burner, not a bomb) and slow its progress? There is much conflicting testimony, further complicated by postwar revisions. Cassidy is not inclined to give Heisenberg the benefit of too much doubt. He speaks of his "renewed commitment to this dangerous strategy of enticing Nazi bureaucrats with the potentialities of nuclear energy in order to gain personal and professional advantages" (p. 445). He also points to the way in which Heisenberg's permitted trips abroad to neutral or occupied countries were exploitable for Nazi propaganda purposes.

Heisenberg died in Munich in 1976. Just before his death he said, "If someone were to say that I had not been a Christian, he would be wrong. But if someone were to say that I had been a Christian, he would be saying too much" (p. 13). Throughout his life he had exhibited an interest in philosophical issues, most clearly expressed in the volume that resulted from his Gifford Lectures of 1955, *Physics and Philosophy* (London: George Allen and Unwin, 1959). He revived the Aristotelian notion of *potentia* as a way of thinking about quantum entities which did not possess definite positions or momenta until measured by an observer. Towards the end of his life, Heisenberg returned to the Platonism that had captivated him in his youth. These seem genuine interests, and I think Cassidy is harsh to say that "Heisenberg's systematic philosophical pronouncements were always tailored for public consumption and were thus informed and motivated to a great extent by his personal aims in addressing each particular audience" (p. 255). In the last sentences of his memoirs, Heisenberg turned again to his great love of music, which had been such a source of inspiration and solace to him throughout his life. "Faith in the central order keeps casting out faintheartedness and weariness. And as I listened, I grew firm in the conviction that, measured on the human scale, life, music and science would always go on, even though we ourselves are no more than transient visitors . . . in the great drama of life" (p. 545).

David Cassidy has written a long and meticulously researched biography of one of the leading figures of twentieth-century science. His style is somewhat pedestrian, and the account of the science is not always clear or even (sometimes) entirely accurate. A little judicious exercise of illuminating power of hindsight would have helped the exposition. Cassidy takes trouble to set Heisenberg's story in the wider setting of German life and politics,

at the cost of occasional indigestible details of Bavarian or scientific intrigue. Despite these defects, the book is one that will long remain an indispensable source of information about the discoverer of the uncertainty principle.

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Physics, Philosophy, and Theology: A Common Quest for Understanding.

Edited by ROBERT J. RUSSELL, WILLIAM R. STOEGER, S.J., and GEORGE V. COYNE, S.J. Vatican City State: Vatican Observatory, 1988; distributed outside Italy and Vatican City by the University of Notre Dame Press, Notre Dame, Indiana. 14 + 419 pages \$14.95 (paper).

This book is a collection of eighteen essays representing an outgrowth of a study week at the Vatican in 1987. The three subjects of the title are discussed and connected with great breadth—and often also depth—by eighteen authors. Their erudition is rivaled only by their productivity and their diversity. Because the book treats so many different subjects and includes such variation in writing style, it is not easy to write a review that does justice to the entire book and all its authors. It is just not possible to go through it paper by paper and describe each one. To key on some papers and omit reference to others would lead to different problems. So an attempt will be made to point to themes that run through various papers.

An attitude common to all the authors is that both religion and science are to be taken seriously. Similarly, and in keeping with the venue of the conference that led to this book, the authors generally take religion to mean Western religion, most often Christianity, but certainly not exclusively Roman Catholicism. Vatican sponsorship certainly did not limit participation to Roman Catholics. All three of the disciplines listed in the title are represented in the list of authors.

As one might expect, the philosophers among the authors are fond of tracing their ideas back to ancient Greece; the theologians do some of the same, but with liberal admixture of biblical and often patristic sources. The physicists are much less interested in the ancient viewpoint, but they have added their own cultural flavor: They are mostly young enough to be thoroughly capable in computing methods, and they tend to expect at least minimal computer literacy on the part of the reader. Personally, I like this trend.

To illustrate the point about computers, Frank Tipler includes concepts of information processing and storage in his definition of life. He refers to Turing's theories of computing machines and relates them to Aristotle, as filtered through Saint Thomas Aquinas. He eventually describes the Omega Point, the end of our universe, in terms of the information stored:

[*Zygon*, vol. 28, no. 1 (March 1993).]

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“the Omega Point is omniscient.” On a more mundane level, John Polkinghorne uses common experiences with computers as a way of attacking the doctrine that consciousness is the key to solving the measurement problem in quantum mechanics: i.e., when a quantum mechanical system can choose between two possibilities, then perhaps the choice is not really made until it registers on human consciousness. Polkinghorne gets us to agree that computers are not really conscious, yet if they receive data from detectors, store the results, and print them onto paper, the choice of alternatives (in technical terms, the collapse of the quantum mechanical wave function) surely does not await the reading of the paper record by a conscious scientist weeks later. Robert John Russell agrees that computers viewed as data gatherers remove the basis for many tedious things that have been said in efforts to connect quantum mechanics with telepathy and other nonscientific constructs.

Many of the papers contrast different attitudes toward the ideas of interest in the science-religion dialogue. Ian Barbour reviews the various attitudes toward science and theology as related disciplines. Ernan McMullin and Richard Clifford both present comparisons of creation stories (myths) from various parts of the Bible, from cultures cognate to biblical Judaism, from Aristotle and Aquinas, from rationalism, and from the evolutionary perspective of Darwin and Teilhard de Chardin. W. Norris Clarke, Janet Soskice, Mary Hesse, and Nicholas Lash all provide contrasting views from current (including postmodern) thought systems.

Among the papers by physicists, there is a division between two paradigms: quantum mechanics and general relativity. Quantum mechanics is the theory of systems the size of atoms or smaller. Since its formulation in the 1920s, it has been outstandingly successful at describing diverse microscopic phenomena, but it has a history of unresolved issues concerning the measuring process and the meaning of what is described. John Polkinghorne, Robert J. Russell, and Chris J. Isham address these questions.

General relativity, central to Isham's essay, is Einstein's theory of gravity; it dates from 1915, and it has been tested only rarely since then, but it has passed all the tests. It is the simplest gravitational theory to do so. Quantum mechanics and general relativity have thus far resisted all attempts to merge them into a single coherent form. Few physicists doubt that one day someone will discover the correct quantum theory of gravity, but until that day arrives, we have to make do with rather ad hoc models of what we think the correct theory might say. The difficulty comes to a head when one considers cosmology, the study of the universe or cosmos.

Since the 1960s, the dominant paradigm for cosmology has been based on general relativity, specifically on the singularity in Einstein's equations out of which flow space, time, and matter. This singularity was discovered by A. A. Friedmann in Russia and by Georges Lemaître in the West; it seems a pity that in this book with much talk of cosmology, Friedmann is mentioned only once in passing, and Lemaître, who was for years president of the Pontifical Academy of Science, is not mentioned at all. The singularity is called the Big Bang, and ever since it happened the galaxies have been flying away from each other at prodigious speeds. In recent years cosmologists have become increasingly curious about what went on in the earliest fractions of a second of the existence of the universe. Therein lies a great difficulty: The high concentration of mass requires general

relativity, and the small space requires quantum mechanics, but the two are not yet compatible. So without a quantum theory of gravity, it is not possible to describe with confidence the behavior of the very early universe.

It is here that the connection is made between cosmology and theology, since nearly every religious tradition sees God as the Creator in one sense or another. The Big Bang has often been seen as especially consonant with the biblical account of creation as expressed in the first chapter of Genesis. There are several objections that need to be understood as antidote to a too-quick triumphalism on the part of those who would say, "The Bible had the right answer all along, and finally the scientists have managed to find it." Richard Clifford and Ernan McMullin remind us that the account in Genesis, chapter 1, is not the only biblical story of creation. Even if it were, Ted Peters points out that its author or authors may not have intended the story to form a basis for a doctrine of *creatio ex nihilo*, creation from nothing, as expounded in early Christianity. Chris Isham adds that the details of the Big Bang are still under consideration, and although the main outlines seem clear enough, future scientific research may well introduce significant change in our story of what happened a long time ago.

A common theme appears in almost every paper: analogical methodology. The words *metaphor*, *simile*, *parable*, *myth*, and *model* are variously employed for attempts to describe what is outside the ordinary processes of perception and is therefore only imperfectly expressed in natural language. Metaphor and simile have a literary ring to them; parable and myth are tools for theology; models are what scientists invent. All are examples of analogical thinking, and all have their place in describing the ultimate, as indicated either explicitly or implicitly by nearly every contributor.

The natural question to ask next is how good this book really is and whether it is worth adding to your library, either personal or institutional. As with any book, one must consider both the good and bad features. The worst thing about this book is that it lacks a subject index; there is a name index, but if, for example, you want to know which authors discuss myths, you are out of luck.

An important feature of the book that may be decisive in whether or not your purchase it is its function as a sampler of the output from a group of important thinkers in the science-religion dialogue. Ian Barbour's paper became the first chapter of his splendid book *Religion in an Age of Science* (San Francisco: Harper & Row, 1990), based on the 1989-91 Gifford Lectures. Frank Tipler's ideas have been expressed at length with great clarity in the book that he and John Barrow published, *The Anthropic Cosmological Principle* (Oxford: Clarendon Press, 1986). John Polkinghorne's paper summarizes the thoughts in his delightful book called *The Quantum World* (Princeton, N.J.: Princeton Univ. Press, 1984). And the list goes on. Peters, McFague, Pedersen, and others have been publishing their ideas in book form. Where else but in this volume can you find so many good things for the price? On the other hand, if you already own the latest works by most of these authors, you will have less need for this sampler.

I have saved the best for last. In the front of the book, on a signature of pages printed with a different font on better paper, there is a message from Pope John Paul II written especially for this publication. He expresses here the warmth and openness that have become his trademarks. He

deplores certain unfortunate historical happenings that should not have taken place and surely should not be repeated: conflict between the Church and the academic community; isolation among scientific, religious, and humanistic studies; anti-Semitic attitudes by those who were supposed to be Christians. He praises the accomplishments of science and its derivative technologies: Physics and molecular biology are singled out for their progress toward a goal of unity of understanding. He understands the difference between unity and identity and specifically encourages the science-religion dialogue: "If they are to grow and mature, peoples cannot continue to live in separate compartments, pursuing totally divergent interests from which they evaluate and judge their world. A divided community fosters a fragmented vision of the world; a community of interchange encourages its members to expand their partial perspectives and form a new unified vision."

After recalling the foundation of the Pontifical Academy of Sciences, the Pope calls clearly and urgently for expansion of the efforts to improve communication between religion and science. He explains how the outcome of such interaction will be beneficial to both parties and to the rest of humankind as well. "Science can purify religion from error and superstition; religion can purify science from idolatry and false absolutes. Each can draw the other into a wider world, a world in which both can flourish. . . . We shall make our choices much better if we live in a collaborative interaction in which we are called continually to be more. Only a dynamic relationship between theology and science can reveal those limits which support the integrity of either discipline, so that theology does not profess a pseudo-science and science does not become an unconscious theology. Our knowledge of each other can lead us to be more authentically ourselves."

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Rethinking Religion: Connecting Cognition and Culture. By E. THOMAS LAWSON and ROBERT MCCAULEY. New York: Cambridge Univ. Press, 1990. 194 pages. \$34.50.

From the start, the authors of this sophisticated, demanding work are in conversation with Dan Sperber's, *Rethinking Symbolism* (tr. Alice L. Morton, New York: Cambridge Univ. Press, 1975). Sperber argues against the "semiological" view of symbolism according to which "the explicit forms of symbolism are *significants* (signifiers) associated to tacit *signifiés* (signifieds) as in the model of the relationships between sound and meaning in language." Sperber substitutes a "cognitive" view, in which "symbolic interpretation is not a matter of decoding, but an improvisation that rests on an implicit knowledge and obeys unconscious rules" (p. xi). He sees a sharp distinction between semiological, linguistic systems, to whose interpretive

[*Zygon*, vol. 28, no. 1 (March 1993).]

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rules language-users must conform, and symbolic systems, whose function is "evocatory," and whose interpretation is "relatively free" (p. 144). Symbolic materials are cognitive, but not in the sense of breaking a code, of being "paired with their interpretations in a code structure" (p. 85). Rather than appealing to an impersonal, rigid, codified set of interpretive rules, Sperber wants to put the "relatively free" activity of thought back into the symbolic process (he wants to "rethink" symbolism).

Lawson and McCauley also advance what they term a "cognitive" approach to religion. Against symbolists and others, they "maintain that participants utilize the cognitive models implicit in religious systems for dealing with the world and the problems it presents—including *explanatory problems*." They call their approach "a sort of neo-intellectualism"; "intellectualism" because "religious systems embody cognitive models which *seem* to explain"; "neo" because religious (and other) symbolic systems do not refer to the world but are "self-referential" (pp. 156-57). Lawson and McCauley argue that Sperber's account of linguistic meaning makes it overly rule-governed. Combining this with the claim that symbolic, and, in particular, religious ritual systems are *more* rule-governed than Sperber recognizes, they argue that his sharp distinction between linguistic and symbolic systems cannot stand. In sum, Sperber's rethinking of symbolism makes it come out cognitive but nonsemantic; having rethought semantics, Lawson and McCauley see religious systems as cognitive and, in their sense, semantic.

These are obviously large themes, which cut across such fields as comparative religion, cognitive psychology, symbolic anthropology, the philosophy of the social sciences, and philosophical semantics. This is a fine work and deserves a wide reading from each of these audiences. The book's complexity and scope preclude detailed treatment even in an extended review. I can only sketch the argument and pick out a few of the many important issues.

I.

In chapters 1 and 2, the authors locate themselves within the broader methodological terrain. Against those who would exclude or subordinate one methodology or the other, they argue for an "interactionist" account of explanation and interpretation; one method concerns more purely conceptual issues, another more purely empirical ones. Then follow brief portrayals of what remain three influential methodological approaches to religious systems: intellectualism, which construes myths, for example, as putative explanations of the world; symbolism, which searches for the hidden meanings that symbolic activities disclose; and structuralism, according to which the language of myth and ritual is about the categories of human thought. Lawson and McCauley acknowledge debts to each but fault all three for failing to see theories of natural language as sources for describing and explicating symbolic, and especially religious, materials.

The authors then develop their "cognitivist" alternative. In chapters 3 and 4, they argue that, in approaching a "symbolic-cultural system," we should turn first to an "idealized participant's" "implicit knowledge" of that system. The basic claim is that ritual participants' understanding of their ritual acts resembles in theoretically interesting ways native speakers' linguistic competence:

Just as speakers have robust intuitions about numerous features of linguistic strings, participants in religious ritual systems possess similar intuitive insight into the character of ritual acts. . . . Participants in rituals who are unable to formulate explicitly even a single rule that governs their ritual system still have many, if not most, of the requisite intuitions about ritual form. (Similarly, many native speakers cannot state even a single rule of their grammars.) (p. 77)

To formalize this basic claim, Lawson and McCauley turn to Chomskian generative grammar. While careful not to overstate the analogy between sentences and (ritual) actions, the authors present (in chapter 5) and defend (in chapters 5 and 6) tree diagrams of what they argue is “highly invariant” ritual form.

What distinguishes ritual from other forms of intentional action is that the religious “conceptual framework,” the participant’s religious beliefs, posits, and the like, have specified the available “action elements”—the identities, or at least the possible range of identities, of the agents, objects, and events involved in the ritual. (This emphasis on the participant’s intentionality and conceptual scheme makes it a cognitive theory.) Specifically, religious conceptual frameworks are committed in some way to the existence of “superhuman agents”; these latter “are *not* possible agents in our commonsense view of the world” (p. 94). Then comes what for many in religious studies will be the heart of the book, the claimed “universal principles of religious ritual structure” (pp. 121ff.). These comprise, first, the “Principle of Superhuman Agency.” According to this principle, “the more directly active a superhuman agent is in a ritual, the more fundamental that ritual will prove to the overall religious system.” The second principle is the “Principle of Superhuman Immediacy,” which states that “the fewer enabling actions to which appeal must be made in order to implicate a superhuman agent, the more fundamental the ritual is to the religious system in question.” (Thus, “a parishioner’s blessing is less important to the Catholic system than is Jesus’s institution of the Church.”) These principles are not empirical generalizations but rather make possible programs of empirical research (pp. 123–24).

In chapter 6, Lawson and McCauley outline a semantic theory adequate to their model of ritual competence, one they call “reflexive holism.” Notoriously, it is not easy to see what aspect of the world religious conceptual frameworks directly refer to; after all, spirits and gods and such cannot be referred to because they do not really exist. But since Lawson and McCauley have made the ritual participant’s conceptual framework the explanatory centerpiece of their theory, traditional, reference-based semantics threatens to undermine their entire project. Thus, calling on an impressive variety of recent studies—from Churchland’s work in artificial intelligence to Achinstein’s criticism of logical empiricism to Quine’s holistic arguments against analyticity to “network models” in experimental psychology—the authors present a forceful case against traditional extensionalist semantics, which they represent as making reference the basic notion. In their view, *all* reference is indirect, not just in religion: “Symbols fit together in seamless wholes which leave no stray referential edges. . . . If reference makes any sense in these contexts, it is simply some sort of collective self-reference” (p. 148). Hence, reflexive holism, and neo-intellectualism. Chapter 7 returns to the proper balance of explanation and interpretation, extends the earlier critique of structuralism, and suggests

that—as it has in the case of religious ritual systems—the competence approach to theorizing offers a promising way of connecting the cognitive and the cultural.

II.

At the center of *Rethinking Religion* is the question whether natural language and other symbolic-cultural systems differ in kind. Sperber thinks that they do, and Lawson and McCauley list and then convincingly refute four of his main arguments (pp. 70ff.). Yet many readers will feel that Lawson and McCauley fail to appreciate the strongest argument for the disanalogy. In natural language, one point of the extensive constraint on literal meaning is to make possible precisely the kind of innovation that is proscribed by the rigorous constraint on ritual form. I do not think we would recognize someone as fully semantically competent who was incapable of the sort of innovation I have in mind. We would not normally say that someone has mastered the meaning of an expression like “Juliet is the sun” if the person thought that the expression could only be used to express a trivial falsehood. It is trivially false, but a competent language-user who knows what it (literally) means will also be able to use the sentence toward romantic (and many other) ends.

By contrast, someone who considered innovation an essential feature of ritual competence would likely be considered ritually *incompetent* (perhaps due to the Principles of Superhuman Agency and Immediacy!). He would likely be said not to have mastered the ritual. If so, the question is whether this marks a difference of kind or of degree between natural language and other symbolic-cultural systems. Lawson and McCauley expressly note this contrast, remarking that one does not typically “play” or “innovate” from ritual form as one does with natural language (p. 82). But my reaction is to say that this marks a deep difference between semantic and ritual competence, that Sperber errs in the right direction.

At one point the authors seem to suggest that this distinction is blurred by the ritual participant’s ability to “imagine” novel rituals and make judgments about them *according to the authors’ universal principle of ritual structure* (p. 112). But if the judgment is dismissive, then the disanalogy stands, for we language-users recognize the communicative value of even the deliberate malapropism or the premeditated abuse of grammar. And if the judgment is positive—if the deviation is incorporated into the community’s ritual repertoire—then it is “novel” in only a Pickwickian sense. By contrast, in no sense do the metaphor and malaprop become *true*, nor do we often revise our grammar so as to legitimize the infraction. (It seems to me that the authors’ universal principles of ritual structure stand or fall apart from this issue.)

Lawson and McCauley argue at length against the extensionalist program in semantics. But, on my reading, the weakest aspect of the book is its unargued assimilation of extensionalism to reference-based semantics (chap. 6, 3). In fact, many current varieties of extensionalism take truth rather than reference as fundamental. For example, Quine’s idea is that, if you know what it would be for a sentence or utterance to be true, you know what it purports to refer to. Reference turns out to be semantically (and epistemologically) uninteresting (thus Davidson’s paper, “Reality without Reference”). One must hasten to add that the status of truth-

conditional semantics is far from clear (Quine himself has recently been tentative about this). Still, extensionalism cannot simply be tied to a reference-based approach to semantics.

The authors argue against extensionalism on holistic grounds, and that, too, is puzzling. They do argue effectively that holism undermines the meaning-as-reference view. The idea underlying semantic holism is this: If a concept is given content by its location in the wider theory or scheme or model of which it is a part, then that content cannot be got through an isolated one-to-one mapping of that concept onto the aspect of the world to which it is supposed to refer. (In recent work J. A. Fodor has argued that holism may well infect belief-attribution but not content- or meaning-attribution, which he sees as denotative.) The holist sees no harm in holding that *apple* refers to an apple so long as we realize that apple-talk depends on color-talk and weight-talk and tree-talk and food-talk and juice-talk and space-and-time-talk and reidentification-talk and so on without limit. So the problem I see here is that this general picture of meaning leaves extensionalism untouched. After rehearsing their holistic arguments, Lawson and McCauley conclude: "If we apprehend reality by means of our idealized models of the world, then there is no cognitively unmediated access to the world-in-itself" (p. 151). But there is a confusion here. The extensionalist does not require "unmediated access" to anything but merely notes that people are inclined toward "apple-talk" when confronted with apples—the juicy little things themselves—and adds the holistic point that talk of apples makes sense only in the context of color, weight, etc. The authors expose no bar to an extensional holism.

This is a weighty point for Lawson and McCauley, for by dissolving extensionalism—and the associated claim that a conceptual scheme has cognitive content only if it refers "directly" to the world—they aim to clear a cognitive space for some conceptual schemes that do *not* seem to refer to the world, chief among them religious ones (p. 156). This strategy seems to me to leave behind some innocent victims. Throughout the volume the authors are openly hostile both toward antireductionist, *sui generis* protectionist strategies (several prominent historians of religion are named) and toward those theorists who hold that the apparent falsity of religious beliefs must be relevant to our understanding of religious behavior (some positivists are singled out). On both counts, the criticism is deserved; indeed, many of us have learned to see in Eliade and in the early Ayer the mirror image of the other's excess. But, in the end, one feels that it is the more measured, thoughtful critic of religion who is treated unfairly by Lawson and McCauley's one-sided characterization of extensionalism. For one need not defend a reference-based semantics or claim "unmediated access" to the world or even to protocol-sentences in order to feel uneasy about the meaningfulness—the cognitive content—of much religious discourse and behavior. (For a recent discussion of postpositivist motives and options, see Lawrence Sklar, "Invidious Contrasts within Theories," in *Meaning and Method: Essays in Honor of Hilary Putnam*, ed. George Boolos [New York: Cambridge University Press, 1990], pp. 197-213.) Such persons will prefer an approach to semantics that respects their unease over one that denies it.

I have focused on areas of disagreement, but—to invoke a good holistic doctrine—the sharpness of these testifies to the existence of much wider

regions of commonality. In *Rethinking Religion*, Lawson and McCauley engage the truly important methodological issues in contemporary religious studies and advance the discussion on nearly every front. And considering the number of fronts the book addresses, that is an impressive achievement.

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The Myth and Ritual School: J. G. Frazer and the Cambridge Ritualists. By ROBERT ACKERMAN. *Theorists of Myth*, vol. 2. New York: Garland Publishing, 1991. xii + 253 pages. \$34.00.

Robert Ackerman's concern in this book is to describe how myth was understood at the turn of the century and to assess the influence that understanding of myth enjoyed. In the first three chapters, he sketches briefly the influence on the study of myth by Enlightenment rationalism, romantic historicism, and nineteenth-century philology, and the work of the nineteenth-century British anthropologists—especially that of A. Lang, E. B. Tylor, and Robertson Smith. In the remainder of the book, he analyzes the work of Frazer and his influence on Harrison and the other Cambridge ritualists and provides an account of their understanding of ritual as it relates to myth and the range of influence their views exercised.

The material in the first three chapters, Ackerman notes, relies essentially on secondary scholarship. Having treated eighteenth-century rationalists, including Hume, and the reaction to them, in chapter 1, Ackerman notes that the general perception of the Enlightenment's inquiry into the pagan past is largely that it was an attempt to establish the ascendancy of reason over myth and religion. The nineteenth century, he maintains in chapter 2, abandoned that intellectual trajectory, no longer seeing myth as a "disfiguring inheritance," but rather as the product of a faculty common to all humans, which therefore required careful understanding. He examines two major conflicting approaches to achieving such an understanding which emerged in that century: that inspired by romantic historicism, which was essentially historical, archaeological, and philosophical, and that inspired by a more progressivist evolutionary biology and largely to be found in a comparative anthropology, with philology playing a dominant role within it.

In chapter 3, Ackerman treats the thought of Lang, Tylor, and Robertson Smith, whose ethnographic approach to myth he sees as resolving the conflict between the above-mentioned romantic and progressivist approaches. Robertson Smith, of course, was the most influential of the three and of especial importance to the ritualists, for he "placed the study of ritual in primitive religion in the forefront of scholarly consciousness by arguing that the rite in antiquity took the place of the creed" (p. 43). This

[*Zygon*, vol. 28, no. 1 (March 1993).]

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inversion of emphasis on practice rather than on creed in the work of Robertson Smith made myth a secondary development that required a thorough knowledge of ritual if it was to be properly understood. It is this aspect of religious studies work that was adopted by the ritualists.

In chapter 4, Ackerman starts into his own study and analysis of Frazer and his influence on the ritualists. He argues that Frazer was not simply a ritualist in his theorizing about myth, but rather that he held at least three theories of myth at different times. Moreover, the theories were not consistent with each other; two of them—euhemerism and intellectualism—were rationalist positions. Ackerman argues that despite that inconsistency, Frazer is still rightly seen as, in some sense, the originator of the ritualist school (p. 64). The ritualists, like Frazer, never doubted that (a) evolution was the dynamic of human culture, and (b) the comparative method of studying it was valid. The ritualists, however, also differed from Frazer by looking beyond his rationalism for a more comprehensive understanding of the functioning of the human mind, and by drawing heavily upon vitalism, psychoanalysis, and the sociology of Durkheim and his colleagues. The notion of the organic relationship of all social intuitions was fundamental to their theorizing.

Chapters 5 and 6 treat the work and influence of Jane Ellen Harrison on the Cambridge ritualists, a group that included, in addition to Harrison, G. Murray, F. M. Cornford, and A. B. Cook. In chapter 5, Ackerman reviews Harrison's early work because, he argues, no understanding of the ritualists can be achieved without understanding her life and temperament—i.e., without understanding her need “for making passionate intellectual friendships” (p. 68). In her, he argues, the ritualists were able to transcend the ordinary scholarly restraints that usually characterize academic communities. He writes, “She was the centre of the group because she always seemed to have had a broader conception of their common subject matter than any of the others” (p. 68). Her work was fundamentally aesthetic rather than scientific and rested on a natural intuitive feeling for the “primitive” rather than on rationalistic explanation. In chapter 6, Ackerman extends the analysis of the relationships among Harrison and the other Cambridge ritualists, focusing especially on the work of Murray and Cornford. And in the last two chapters, he deals with the achievements of the ritualists more generally and with subsequent developments.

In concluding, Ackerman, although admitting that the consensus among classicists and ancient historians regarding the work of the ritualists is emphatically negative, argues that it would be facile “to write them off as having allowed their spiritual needs to co-opt their scholarship fatally” (p. 186) and to conclude that they had simply rejected sound thinking. Their enduring influence, he insists, can be seen in comparative religions and especially on Near Eastern studies and on literary critics like Northrop Frye.

This book will be of particular value not only to literary critics and theorists; but also, and perhaps especially, to students of religion, many of whom have not really taken note of the importance of the myth/ritual debate in the study of religions. Ackerman has presented a very clear account of the emergence and achievements of the Cambridge ritualists, which can serve as an introduction to the matter for scholars in both fields. His account is well researched and well argued, and, from the point of view of the student of religion, at least, provides a much-neglected theoretical approach

to religion that deserves reconsideration. He shows that, whatever the final verdict on their work, the Cambridge ritualists did not labor in vain.

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