THE COMPLEMENTARITY OF THEOLOGY AND COSMOLOGY

by Harold H. Oliver

The title of this essay, "The Complementarity of Theology and Cosmology," juxtaposes three terms whose meanings are not self-evident; thus the claim it makes is subject to misunderstanding. The danger of poorly defined terms in such a claim is either that one will agree too readily with it, where in fact differences are real and deep, or that those who agree on the state of affairs may seem to be in disagreement. Where there is general agreement on definitions—and such a consensus is a requisite for intelligent discourse—a different set of problems arises. Either the theologian may seem to be conceding too much to the cosmologist, thereby surrendering the distinctiveness of religious claims, or the cosmologist may seem to have abandoned the scientific rigor of his profession which has been achieved in a hard-fought struggle against religious authoritarianism. Two tasks emerge from the outset: to seek to achieve some agreement on the meaning of the terms "complementarity," "theology," and "cosmology" and to defend the claim that is made by their juxtaposition in the title.

The terminological question is complex, as a preliminary survey will indicate. The term "complementarity" took on special significance when Niels Bohr conscripted it to resolve the wave-particle paradox in quantum physics. Today there are purists who maintain that only the meaning implied in Bohr's use of the term is legitimate when applying it to a broader range of issues, while others believe—with Humpty Dumpty in *Through the Looking Glass*—that it can mean just what they choose it to mean. As I shall attempt to argue in due course, the purists are unduly rigid—as is always the case with purists—and the view of Humpty Dumpty is unduly libertine. The word "complementarity," like the terms "theology" and "cosmology," imposes some limitations on its use, and I shall try to respect these limits.

The term "theology" signifies a quasi-philosophical enterprise

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[*Zygon*, vol. 13, no. 1 (March 1978).]

which has as its first item of agenda the necessity to define what it is. A consequence of this state of affairs is that there is a long and mostly illustrious history of diverse answers. Some theologians do not distinguish sharply between "religion" and "theology," believing that they represent points on a spectrum which moves more or less in a continuum from simple to formal reflection. This is my own position. Other theologians make a rigid distinction between primary religious experience and the secondary reflection upon it which is properly called "theology." The latter often further subdivide theology into second- and third-order reflection, reserving the term "metatheology" for whatever they determine to be the final stage of reflection. Although the term "theology" seems only to impose the formal restriction on the user that his reasoning be about *theos,* there is wide disagreement upon just what *theos* must mean. Some theologians claim to be focusing on religious statements, others on religious experiences, while still others hold adamantly to the view that theology is necessarily about a divine object. This scholarly pluralism reflects the general pluralism of our Judeo-Christian culture.

The term "cosmology" is equally ambiguous. Having developed at a time when physics was a branch of metaphysics, it continued for centuries to denote the science of the totality of physical reality. The separation of physics from metaphysics, which some argue was essential to the development of modern science, resulted in the eventual restriction of the term to its use in the physical sciences. The eclipse of metaphysics which attended the era of positivism in philosophy coincided with the origins of modern physical cosmology and thus set the stage for the final reduction of the term "cosmology" to the simple meaning: that branch of physics which studies the large-scale structure of the universe and its *arche* and *telos* in theories in which evolution is assumed. It must be admitted by reasonable persons, however, that there are fundamental metaphysical questions surrounding such a restriction of the term. There are in fact some philosophers, like Alfred North Whitehead, for whom cosmology is a metaphysical undertaking of the greatest comprehensiveness; Whitehead's *Process and Reality,* which represents the most nearly complete statement of his views on man, world, and God, carried the subtitle, *An Essay in Cosmology.* Other philosophers, perhaps more modestly but with no less conviction, have wished to capture the term as a designation of the total philosophical enterprise. Such is the case with Karl R. Popper who claimed, in his famous work *The Logic of Scientific Discovery,* that, *contra* the language philosophers, there is "at least one philosophical problem in which all thinking men are interested," namely, "the problem of cosmology: the problem of understanding the world—

including ourselves, and our knowledge, as part of the world. All science is cosmology, I believe, and for me the interest of philosophy, no less than science, lies solely in the contribution which it has made to it."[1] However one may feel about these two positions, there is a resurgence of interest in metaphysics which may well lead to a broadening of the scope of the term cosmology and to a more concerted cooperative labor of scientists and philosophers on a purely deductive cosmology.

I have chosen as a means of defining the principal terms of my title to discuss first of all the major models of interaction between science and religion which hitherto have seemed viable and to use this as a modus operandi for suggesting a new foundation for the thesis of complementarity.

Models of the Relationship between Science and Religion Critically Compared

The relationship of theology and cosmology first became problematical with the pre-Socratics, for in the mythical world views which preceded them theology and cosmology were an identity. The pre-Socratics initiated the transformation from mythology to rational theory, with an inevitable resultant bifurcation between the stories of the gods and the explanation of the world. Only in periods of romanticism—like our own—with their open critique of objective science has the dream of their reunification been revived. Characteristically in the West the bifurcation has seemed to be in the best interests of both religion and science—of religion, whose spokesmen have resisted the efforts of some to make the scientific vision omnicompetent; of science, for the pathos of its modern origins was a direct function of religious myopia. In the claim of their complementarity to be advanced in due course I assume that the thesis of bifurcation is basic to both the *esse* and *bene esse* of religion and science, and I will attempt to ground this claim by showing that these two great human activities are rooted in quite different—though complementary—operations.

The relationship between religion and science has taken three major forms in the twentieth century: the conflict theory, the compartment theory, and the theory of complementarity.

The Conflict Theory. This theory assumes that science and religion represent alternative—we should say rival—theories about the same domain. Religious statements about the world are preferred by believers to scientific theories, especially when they conflict. There are scientists as well who hold this theory, as is evident in the fact that they maintain that religious statements represent adolescent ideas about

reality. Both groups interpret religious statements literally; they differ only on the question of whether such statements accurately represent an actual state of affairs. It is all too easy for those of us who value modernity to think that the conflict theory made its exit in the nineteenth century or earlier as one of the last vestiges of medieval superstition. We have been reminded recently that the theory is still defended even in the U.S., as for example in the recent altercation between the "creationists" and "advocates of science" in California. The pressure which the "creationists" in some instances have applied successfully to state officials to have the Genesis account of creation included in textbooks is clear evidence of the conflict theory. These "creationists" are not asking that the Genesis account of creation be taught as "religious instruction" since most of them are ardent defenders of the separation of Church and State. Rather they want the biblical account taught as an alternative to prevailing cosmological theories. Before we pass too severe a judgment on the narrowness of this position, we need to ask whether their overreaction to educational policy is totally unjustified. They are convinced that scientific theories of the origin of the world have been taught frequently as an alternative to the Genesis account, considered as obsolete science. The fact that the conflict model has been operative to some extent on both sides of the issue goes a long way toward explaining the intensity of the struggle between these two groups. I do not wish to be misunderstood; I hold firmly that the biblical account of creation is religious, not scientific instruction, and should be so judged by the courts of the land. The view of complementarity which I shall present implies, however, that it is equally myopic for scientists to regard the biblical account as bad science, for the Genesis account is not "science" at all. I suspect that the conflict theory is well entrenched and will have to be dealt with for a long time. The defense of complementarity in this essay is offered in the hope that this conflict theory will run its course sooner than later. I hope to show that two major alternatives to it, the compartment theory and the theory of complementarity, make for better science and religion.

The Compartment Theory. Although it is common to think that the compartment theory can be stated simply, it in fact encompasses such a diverse following that some subcategories are needed to cover the actual situation. The general thesis of this position is that science and religion represent nonrival theories since they refer to different "domains." It is because different meanings are assigned to the term "domain" that the subcategories are needed. Scientists and theologians alike have identified frequently with this view, some for reasons

of general tolerance alone. For whatever reasons, the prominence of the compartment theory has been partly responsible for providing scientists with sufficient lebensraum to develop their theories. A negative consequence of this state of affairs, however, has been a laissez-faire attitude toward each other's work so that fruitful interaction cannot take place.

Only two subcategories of the compartment theory will be discussed: The first is that the domain of scientific statements is the physical world; the domain of religious statements is a spiritual realm, about whose exact nature theologians of this view do not seem to agree. Perhaps the kindest way of expressing what is meant by the domain of religious statements is that, whereas scientific statements refer to the physical world, religious statements refer to the source-and-ground of the world who sustains its processes. The neoorthodox theologians who dominated European and American theology for several decades all held some such view. Among the "second-generation" dialectical theologians, Thomas F. Torrance can be interpreted reasonably as representing a contemporary version of this theory in that he speaks of science and religion as each having radically different "objects" which they each should illumine in the same—that is, scientific—manner.[2]

A second subcategory of the compartment theory maintains that scientific and religious languages do not conflict because only the former is cognitively referential. When the theologians of this subview proceed to say how religious statements are to be interpreted, they further subdivide into at least two major schools.

Rudolf Bultmann and his followers held that religious language is to be interpreted not literally (objectively referential) but existentially, that is, anthropologically. Statements about God are to be interpreted as statements about man. The intentionality of religious discourse separates it categorically from scientific theory. It is interesting that Bultmann did maintain that cosmological elements in religious mythology were to be regarded primarily as "pre-" (i.e., "un-") scientific. Bultmann held to the absolute priority of science over religion in matters of nature and absolute priority of religion over science in questions of human existence. This is clearly a compartment perspective.

For another group of theologians (and philosophers) religious discourse is fundamentally emotive or attitudinal language. In his infamous attempt to bring about "the elimination of metaphysics" A. J. Ayer grouped metaphysical and religious discourse together under the rubric of "emotive language." Accepting this judgment, R. B. Braithwaite proceeded to make the case that religious statements are

nothing more than declarations of how believers intend to behave. Paul van Buren, under the influence of Braithwaite's empiricism, developed a theology in which the attitudinal perspective on religious discourse became "the secular meaning of the Gospel." One readily sees that for these thinkers there can be no conflict between scientific and religious statements; they stand in separate, "hermetically sealed" compartments.

The compartment theory has been especially attractive to scientists since it guarantees them absolute freedom, while leaving open to some extent the question as to how religious language is to be evaluated. A change in a given scientist's personal attitude toward religious claims necessitates no modification of his professional habits and goals. Theologians who espouse the compartment theory feel comfortable to the degree that it removes the sense of threat which the relentless progress of science has posed to traditional religious claims.

Whatever its personal and professional assets, the compartment theory—in my judgment—does not comprehensively and adequately take account of the deepest insights and intentions of either physical theory or religious discourse. I must try to show that this claim is justified.

The Theory of Complementarity. The thesis of complementarity is that science and religion represent coordinate perspectives on the same domain. Ever since Bohr advanced the term "complementarity" to resolve paradoxes in microphysics, it has become increasingly popular to claim that science and religion offer complementary views of reality. But the fact that the term has meant such different things to those so using it has resulted in a kind of "mushy" consensus. One indication of the seriousness of the terminological issue is that two recent philosophers felt compelled in a recent issue of *Zygon* to review the question and argue their respective opinions. One of these philosophers, Hugo Adam Bedau, sets out to establish the conditions for the legitimate use of the term "complementarity."[3] After surveying briefly the major options on the current scene, Bedau argues that of the two logical alternatives only one fulfills these conditions. He rejects the first option,—"the *truth* of 'science and religion are complementary' depends on the truth of 'quantum mechanics involves complementarity' "; nevertheless he argues a purist position of less stringency—"the *meaning* of 'science and religion are complementary' depends on the meaning of 'quantum mechanics involves complementarity.' "[4] His rejection of the first option is based appropriately on the insight that even if physicists should abandon the principle of complementarity in quantum mechanics the application of the term to the question of the

relationship of science and religion would not be undermined. Does agreement with Bedau thus far entail agreement on his second option?

Bedau rephrases his central thesis in the following way: "... the complementarity alleged in fields other than physics is all but unintelligible unless such allegations are based on an understanding of the term 'complementarity' on the model provided by Bohr's notion of complementarity in quantum physics."[5] It is fundamental to Bedau's case that since the would-be complementarist did not invent the neologism he is obliged to follow the meaning assigned to it by Bohr. The argument continues: "Is he [the would-be complementarist] ... to be guided by nothing more than the analogies provided by the meaning of 'complement' and cognate terms in pre-Bohr usage? If so, this resolves into the attempt to adapt the term from its use in logic, geometry, and chromatics; but there is no evidence that any would-be complementarist has had such analogies in mind."[6] I concede that the use of the term in quantum physics did stimulate its application to the science-religion question, but I reject—for reasons which I hope to make clear—his thesis that the meaning Bohr assigned to it is determinative for all later use. There is even some question as to whether the term "complementarity" is in fact Bohr's neologism; even if that were the case, *he* certainly must have been influenced by the meaning of the term "complement" in pre-Bohr usage!

Bedau's main point is that because the term 'complementarity" was designed for the sole purpose of removing paradoxes in quantum physics its essence "is to be found in the way these paradoxes are removed."[7] Bedau's summary of Bohr's intention is accurate. The latter intended "complementarity" as a "restatement of the entire relationship between microobjects, relativizing their classical theoretical properties, corpuscularity/wavelikeness, to the experimental arrangements through which these microobjects are investigated."[8] It follows that a "categorical assignment of either property to a microobject—ascribing the property (e.g., wavelikeness) without mention of the observations or experimental arrangement through which they are obtained—is, strictly speaking, meaningless."[9] I personally feel that Bedau goes too far when he concludes that it is simply impossible to waive the requirement that "there be some legitimate sense of paradox applicable to genuine difficulties relating science and religion."[10] He goes to great lengths to discredit most current theories of the complementarity of science and religion because they fail to prove that any genuine paradoxes are involved. The most Bedau will concede is that there is a "remote analogy" between complementarity in quantum physics and in the science-religion debate.

Bedau's purist position is challenged by D. M. MacKay, who, nevertheless, shares the former's concern that the term "complementarity" has become "an omnibus name" for "a verbal relation, where no other is apparent."[11] Is there some way, he asks, to prevent complementarity from becoming "yet another fashionable escape gate from intellectual integrity in theology?"[12] Here the similarity between the two men ends, however. MacKay refuses to let complementarity in quantum physics become a "paradigm case"; for him, the term refers to a logical rather than a physical concept. It is a "kind of logical relation, distinct from and additional to traditional ones like contradiction, synonomy, or independence" and needs to be carefully considered "whenever there is doubt as to the connection between two statements."[13] Unlike some of the other theories of the relation of science and religion, the complementarist view holds that religious and scientific statements are logically dependent, that is, they are about the same situation. This claim leads MacKay to formulate the following strict condition for all complementary statements: that the alteration or absence of one of the statements would necessitate a change in the other. He adds the additional restriction that the "blanket use of the term [complementarity] is logically empty unless we can say what it would mean for two statements not to be complementary."[14]

MacKay's brief but adequate statement of Bohr's thesis leads him to generalize it differently. It means that "two disparate descriptions can be checked for compatibility only after due allowance has been made for the standpoint from which each is valid."[15] The key concept is thus "difference of standpoint," which MacKay illustrates by appealing to an argument made earlier by C. A. Coulson, namely, that the plan and elevation drawings of a building are complementary to each other in that the views are orthogonal to each other and hence each standpoint is "blind" to the other. He goes on to argue that "each projection exhausts the subject . . . although each leaves undisplayed an aspect of the situation,"[16] a claim which Bedau already has judged to be suspect since no paradox exists between the two projections. So far MacKay has been discussing what he calls "nonhierarchic" complementarity. He holds that there is another kind of complementarity according to which each observer has the same physical evidence available—as, for example, a computer engineer and a mathematician—but their difference in viewpoint lies "in the kind of categories appropriate to each—the kind of cognitive interaction with the subject to which each is made liable by his particular 'state of readiness.' "[17] Thus "the levels of description in such cases form a hierarchy"; they are each exhaustive and in that sense complementary.[18]

MacKay insists that there can be no strict analogy between complementarity in quantum physics and in the science-religion question because complementarity in microphysics is nonhierarchic whereas the complementarity of science and religion presupposes a hierarchic model. Further he argues against Bedau—and I think correctly—that Bohr's use of the term need not be paradigmatic since "his aim was to classify and elucidate their puzzling relation [i.e., wave and particle descriptions] by using an already defined and understood term, not to introduce and define a new term by pointing to their puzzling relation."[19] Lest we think that MacKay is advocating "a loose appeal to common usage," we need to be aware that he does place certain strict conditions on the use of the term "complementarity," one of which reads "that two (or more) descriptions must, respectively, employ terms whose preconditions of precise definition or use are mutually exclusive. . . ."[20] It is apparent that while necessary it is not a sufficient reason for its use. For the latter we need to recall the conditions cited earlier: (1) The alteration or absence of one of the statements would necessitate a change in the other, and (2) the term "complementary" is "logically empty unless we can say what it would mean for two statements not to be complementary." After the presentation of a new relational theory of the complementarity of theology and cosmology it will be appropriate to inquire whether these conditions have been met or should have been.

A Relational Theory of the Complementarity of Theology and Cosmology

The relational metaphysic which will serve as the foundation of a new theory of the complementarity of theology and cosmology did not come into being for this specific purpose. Rather the thesis of complementarity emerged as a logical conclusion to what was a larger intention, namely, to frame a theory of reality which transcends the classical polarities of subject-object, mind-matter, etc. The validity of the case for complementarity rests therefore on the cogency of the relational metaphysic upon which it is based.

It will be impossible, because of space limitations, to present fully the case for a relational metaphysic which I have set forth in another format and which I hope will be available to a larger readership in the near future. What follows is a highly abbreviated version which is presented in the hope that nothing essential to its understanding has been omitted.

The Relational Paradigm. My fundamental thesis is that if one assumes that all relations are internal and from this assumption at-

tempts to derive a coherent theory of reality without assigning priority to mind or world the logical result will be a relational metaphysic in which (1) only relations are regarded as real and (2) the relata—to use classical language—are regarded as derivatives, that is, functional dependencies of relations (to use Ernst Cassirer's language).[21] The initial assumption, that all relations are internal, doubtless will be troublesome to many, as the recent history of debate on the theory of relations confirms. In taking this position I am in agreement with Francis H. Bradley and Brand Blanshard against such philosophers as Bertrand Russell, William James, G. E. Moore, and most recently Charles Hartshorne, who have held that either all or some relations are external. In lieu of the detailed presentation and critique of these positions, which I have given elsewhere, I can assert only that a reasonable case can be made for the thesis of universal internality, according to which—using the words of Moore—"any term which does in fact have a particular relational property, could not have existed without having that property."[22] My reason for holding this to be true is not complicated. Given *aRb,* what *a* is, qua *aRb,* is defined exhaustively as *Rb;* what *b* is, qua *aRb,* is defined exhaustively as *aR.* I would venture the opinion that unwillingness to concede this simple principle has been due to the introduction of agenda extraneous to the logically simple case as, for example, when Hartshorne takes *aRb* as basically asymmetrical for reasons of his fundamental commitment to the notion of temporality. According to his view every relation has a sense or direction, so that one must admit that the earlier (the object) is nonrelative to the later (the subject); the later (the subject) is relative to the earlier (the object.[23] Hartshorne's belief in perceptual nonsimultaneity, which leads him to treat every *aRb* as having directionality, may appeal to some. My principal objection to it is that it brings a prior understanding to the interpretation of *aRb* rather than deriving a metaphysic from it.

In an effort to transcend "subject-object" models of perception I have proposed the following "transpolar" law: Given any classical entitative polarities, it is their relation that is real; the polar terms are to be treated as derivatives. The implications of such a law, treated as true, are far reaching. While I cannot explicate these implications in great detail, I do have the responsibility to present the basic tenets of my relational metaphysic since the thesis of complementarity claimed in this essay is grounded on it.

The fundamental claim is that, given any *aRb,* it is the *R*(elation) that is real. This position entails the further claim that (1) only relations are real and (2) all relations are real. As such it represents an inversion of Leibniz's monadology, which held the monads to be real

and their relations, comprising time and space, to be ideal. I prefer to use the terms "real" and "derivative" rather than "real" and "ideal" to avoid the language of the traditional polarities. My thesis is simply that, given any *aRb*, *a* and *b* are what they are solely by virtue of *R*.

It follows logically from the fundamental thesis, although the monistic idealists who supported the thesis of universal internality did not draw this conclusion, that all other components of our experience are derivatives of these relations. In what sense are they "derived"? It is reasonable to think that the *a*s and *b*s of every *aRb*—that is to say, the "terms" of the relation—arise from viewing the relation biperspectivally. Thus I use the term "biperspects" as a designation for all terms previously treated as classical entities. Derivatives arise as follows: If one focuses attention on ingressive features of any *R*(elation) as acting, there arises the biperspect *a* (= acting on); if one focuses on the effective features of any *R*, there arises the biperspect *b* (= acted upon). They are thus co- or biperspects of the real.

To demonstrate how such a paradigm can account for all the components of our experience, it is necessary to speak briefly about the hierarchy of relations. There is a logical advance from (1) simple relations, that is, *aRb* considered in its simplest manifestation, which serve as an ontological key, to (2) manifold composites of some relations, whose complexity accounts for the discreteness of the units of experience, to (3) the totality of all relations, which is itself a relation. Reflection on simple relations as a key to the whole of experience led to the logical conclusion that the terms are derived biperspectivally. Since this principle is valid for all relations, it is valid as well for composites of some relations, which are also relations. When viewed biperspectivally, these composites of relations give rise to our common notions of "subjects and objects," "mind and brain," "selves and things," etc. These I call "compound biperspects," thus indicating that such notions are coderivative, hence not fundamental. To use Whiteheadian terminology, selves and phenomenal things are abstractions, not concrete entities. To call them actual is to be guilty of the "fallacy of misplaced concreteness." It should be apparent that it becomes inappropriate to opt for idealism, which makes only the subject concrete, or for realism, which assigns fundamentality to an objective world. The final hierarchic category, the totality of relations, is explicated on strict analogy with the principle used for simple and composites of relations. If one concedes that the totality of relations is itself a relation—a claim that is fully consistent with the monistic idealists—one will admit the propriety of viewing this totality biperspectivally. If *R* totality is viewed ingressively, there emerges the derivative notion of "originative subjectivity," or god language. If it is

viewed effectively, there emerges the derivative notion of "the totality of the objective world," the physical *universum,* the cosmos. By analogy I call these derivative notions of god language and world language "omniperspects." Theology and cosmology, respectively, represent the modern areas of discourse which deal with these derivative aspects of totality.

It follows from the relational metaphysical schema that neither theology nor cosmology is fundamental, that neither is an ultimate affair. They are coordinate, penultimate insights into reality. "Reality" is the totality of relations which discloses itself to metaphysics.

Complementarity as Relational Biperspectivism. I have tried to show that the thesis of complementarity can be derived deductively from a fundamentally relational metaphysic rather than by being pieced together from apologetic considerations. It is a thesis of complementarity in that it assumes that theology and cosmology are coordinate perspectives on the same domain, that is, the totality of reality. Thus one of the major necessary conditions has been met. Does this theory meet the sufficient conditions laid down by Bedau and MacKay?

The condition established by Bedau is that there must be some legitimate sense of paradox applicable to difficulties relating science and religion. I do not concede that this condition is mandatory since it rests solely on his conviction—to my mind, poorly defended—that the meaning of the term "complementarity" when used of science and religion is an absolute function of the meaning of the term as used by Bohr. Many physicists and philosophers of science, such as Einstein, Popper, and Mario Bunge, have been unwilling to admit that there is any real paradox even in quantum mechanics, in that they regard only the particles to be "real" in a classical sense. It is tempting to think that the "paradoxes" of the conflict theorists are as "real" as those of quantum physics are to the physicist-philosophers named above. I base nothing fundamental on this observation since I personally hold (1) that there are real paradoxes in quantum mechanics and (2) that their existence is not essential to the application of the term "complementarity" to other areas.

The two sufficient conditions laid down by MacKay must be taken more seriously. His first, that the alteration or absence of one of the statements would necessitate a change in the other, is somewhat difficult to deal with from my relational perspective since admittedly he is talking about complementary "statements" and I about complementary "systems." If this difference is taken into account, I believe that this condition is met, so long as it is recognized that it would be a complex operation but not an impossible one to determine exactly

how a change in one of the systems would require a change in the other.

His second thesis, that the term "complementarity" is logically empty unless one "can say what it would mean for two statements not to be complementary," is simply an analytic judgment following strictly from his assertion that the term is a logical rather than a physical concept. If we try to extend its range to complementary "systems," all that is implied is that something in principle could count against the thesis of complementarity, that is, that it is falsifiable. I am convinced that if one correctly understands the intentionality of both god and world language one will concede that in modern theology and cosmology there is emerging a "convergence" toward a relational paradigm as they each independently move toward greater self-clarification. If this is a reasonable claim, there follows from it the expectation that in principle one could say what it would mean for the two systems not to be complementary.

If theology and cosmology are complementary, how does one "complement" the other? To answer this question I must develop at greater length the unique roles of each and attempt to show that each is exhaustive from its standpoint, but penultimate.

In its viable contact with religion, theology is god talk. I shall deal exclusively with Judeo-Christian god talk since that is our immediate heritage. Theology is concerned with the rational illumination of religious experience. My own theological reflection has led me to develop a relational hermeneutic which judges that the conversion of basically relational insights central to both Judaism and Christianity into a subject-object paradigm of thought inordinately has shifted the center of religious attention away from celebrative participation to epistemological impasses. A symptom of this state of affairs is the recent preoccupation with such issues as theism-atheism, belief-unbelief, and secularity-religiousness, which terminated without resolution in the whole death-of-god madness (*pace* Nietzsche).

This relational metaphysic makes the claim that religious language is to be interpreted exhaustively as an authentic affirmation of the relational nature of experienced reality. It further asserts that Judaism and Christianity reached their heights in participatory affirmations of a divine-human relatedness of ontological significance to both god and man. Another way of saying this is that Hartshorne's insight into the consequent nature of God is faithful to the Western religious tradition. But both Judaism and Christianity were irresistibly tempted by the notion of a nonrelational, remote God, so that preoccupation with God's aseity replaced the original insight of *deus pro nobis*. The Christological formulations, which were—if Torrance is

correct—originally fundamental relational statements, were quickly distorted. The earliest insight that Jesus was a paradigm of what is true quickly deteriorated into a nonrelational Christology, thus creating the ontological chasm between Judaism and Christianity. In a relational theology the distinctiveness of both Judaism and Christianity continues to be affirmed, but it is based on their diverse historical particularity rather than on an ontologically different affirmation.

The complementarity of this understanding of god talk with physical cosmology is based on the further claim that theoretical physics is moving rapidly toward relational categories. The replacement of the fundamental particles located in absolute space and time of classical physics with the space-time events of special relativity, the generalizing of classical gravitational theory in the field aspects of general relativity, and the relational implications of observers and events in the Copenhagen version of quantum mechanics—all of these suggest that theoretical physics, to the extent that it is appropriate to say that it reflects the nature of reality, is moving indeed toward a relational model of reality. This claim is likely to be unpopular with those who think of theoretical physics as the study of elementary material particles and their properties. To them I would quote with agreement the insight expressed by Richard Schlegel that physics "does not take any particular set of entities as its subject."[24] Otherwise how can one explain the continuity of physics through the discontinuity represented by the shift in the understanding of entities from classical to modern physics?

Physical cosmology, as a kind of ultimate discipline of theoretical physics, represents the attempt to understand the large-scale structure of the universe, or universes as the case may be. Whatever progress may have been made in this field in this century—and the problems suddenly have become enormous—is a function of the fact that relational models have been introduced into mathematical physics. Cosmologists are learning that nature is a vast, internally related system; and if Sir Fred Hoyle and J. V. Narlikar are correct in their most recent revival of Mach's Principle, the "system" must be regarded as more fundamentally interlocked than previously imagined by physicists.

For some, cosmology represents the most sustained successful attempt to understand reality. For others, theology has no equal in this regard. The position of this relational metaphysic is that they are distinct but complementary perspectives on reality. If ultimacy is assigned to either, the result is unproductive. *The-ism* in holding god talk as fundamental and world language as derivative is as myopic as *Natural-ism* which takes world language as fundamental and god talk

as emotive, attitudinal, or even obsolete science. The relational metaphysic which has been sketched briefly in this essay arose—autobiographically—from taking both with equal seriousness.

Otherworldliness has been the historical sin of theology made ultimate; indifference and/or hostility to religious language is the unproductive consequence of cosmology made ultimate. It is my claim that both consequences are based on poor perception and self-perception. There is good reason to believe that the deepest insights into both theology and cosmology, from within and without, lead properly to the conclusion that they are coordinate affirmations of the relational nature of reality.

NOTES

1. Karl R. Popper, *The Logic of Scientific Discovery*, rev. ed. (London: Hutchinson, 1968), p. 15.
2. Thomas F. Torrance, *Theological Science* (London: Oxford University Press, 1969), pp. 121 and 125.
3. Hugo Adam Bedau, "Complementarity and the Relation between Science and Religion," *Zygon* 9 (1974): 202–24.
4. Ibid., p. 206.
5. Ibid., p. 207.
6. Ibid.
7. Ibid., p. 209.
8. Ibid.
9. Ibid.
10. Ibid., p. 215.
11. D. M. MacKay, " 'Complementarity' in Scientific and Religious Thinking," *Zygon* 9 (1974): 225.
12. Ibid.
13. Ibid., p. 226.
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