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Religion & Science

History, Method, Dialogue

Edited by W. Mark Richardson

and Wesley J. Wildman

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POSTMODERN APOLOGETICS

OR WHY THEOLOGIAN'S *MUST* PAY ATTENTION TO SCIENCE

NANCEY MURPHY

I. INTRODUCTION

My title includes the old-fashioned word "apologetics"—a word that, for a time, nearly disappeared from polite circles of theological discussion. It may, however, be making a come-back.¹

I teach an apologetics course at Fuller Seminary—not because I had to adopt one that was already in the catalogue when I came, but rather because the intellectual world has changed in recent years, and it has now become an intriguing problem to rethink the entire enterprise. Modern apologetics has, rightly, I think, been judged hopeless or misguided. But what about a postmodern apologetic? Relating theology to science just might be the single most important apologetic task in our postmodern era.

To explain this thesis I shall take the following steps: first, I will explain what I take to be (genuinely) postmodern philosophy; second, I will describe the central apologetic problem within that context; and, third, I will relate what I have been saying to recent work on the relation of science and theology.

II. POSTMODERN THOUGHT

Several groups of scholars are competing to define the term "postmodern." It is a word we seem to *need*: there is a growing recognition that the ways of thinking developed in the modern period have reached their limits, have been effectively criticized from within, and need to be replaced. We have as yet no more descriptive term for what comes next than to say that it is that which follows the modern—the postmodern.

The best-known claimants for the term are probably the deconstructionists in literary criticism and their followers in other disciplines as diverse as law and theology. David Griffin and his school want the term to describe their process approach to reality. In addition, James McClendon and I have tried to claim the term to describe revolutionary changes in philosophy that account for the distinctiveness of self-proclaimed postmodern or "postliberal" theologians such as George Lindbeck and Ronald

Thiemann. According to our definition, some of the above turn out to be postmodern; some merely extreme (and strident) moderns.²

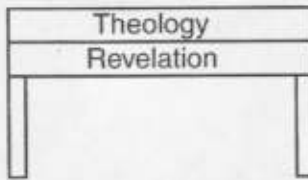
However history settles the issue of terminology, no one will be able to deny that there have been ground-shaking changes in Anglo-American philosophy, whose reverberations cannot fail to be felt in theology, textual criticism, theological ethics and elsewhere.

So what are these changes? While there has been a thorough rethinking of ethics and of philosophy of language, both of which are equally important, I shall concentrate here on changes in epistemology—theory of knowledge. I will describe the change first of all as a change of metaphors. For moderns, knowledge was a building. Thus, two concerns predominated in epistemology: the first was to find a suitably solid foundation for one's beliefs. The primary requirement for foundational beliefs was that they be indubitable—otherwise the "foundation" itself could be called into question, and it would turn out that one was trying to begin construction in midair. The second concern was the manner of construction from there on up. Descartes's foundation was his *cogito* (and a mixed bag of other ideas he found himself unable to doubt, such as the metaphysical principle that there must be at least as much reality in the cause as in the effect); the means of construction was demonstrative reasoning. For Locke, the foundation was ideas derived from sense perception; and Hume then pointed out that deductive reasoning—the only solid mode of construction—could not be used on a foundation of that sort.

These notions about knowledge had their effect on theology in due course. The only two options for theological foundations seemed to be scripture or some form of self-authenticating religious experience. (When it comes to foundationalist theologians, fundamentalists are the best of the lot because, if one is to use scripture in this way at all, the epistemological doctrine calling for *indubitable* foundations demands a theological doctrine of *inerrancy*.)

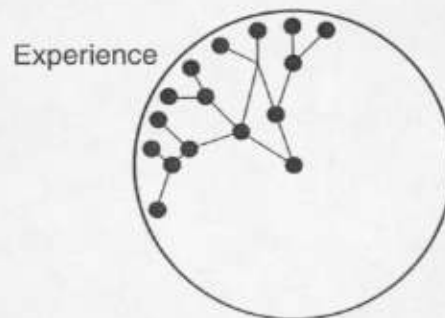
Modern epistemology had consequences for apologetics, too, of course. The modern strategy called for finding some way to attach to the "bottom" of the Christian belief system some small number of additional premises that would be unquestioned by non-Christians and would in turn warrant the entire system of thought. And so, for instance, Locke's strategy was to use miracles and fulfilled prophecies as a "deeper layer" of support for the claim that the Bible was the revealed word of God. Much later, E.J. Carnell, my predecessor at Fuller, presented as "the axiom of a decent society that in all matters where a good man is competent to judge, his word should be accepted unless sufficient reasons are found for rejecting it." Jesus was unquestionably a good man and it follows that the whole of his teaching is to be trusted.³

If we liken knowledge to a building, the picture these apologists present is of a massive structure teetering on a few thin supports. No wonder most have abandoned the entire enterprise. The quest for an unquestionable foundation has turned out to be quixotic.



The new metaphor for knowledge—the “web” of belief—was suggested by Willard Quine. I like Quine’s sparse prose, and so I will let him speak for himself:

The totality of our so-called knowledge or beliefs, from the most casual matters of geography and history to the profoundest laws of atomic physics or even of pure mathematics and logic, is a man-made fabric which impinges on experience only along the edges. Or, to change the figure, total science is like a field of force whose boundary conditions are experience. A conflict with experience at the periphery occasions re-adjustments in the interior of the field. Truth values have to be redistributed over some of our statements. Re-evaluation of some statements entails re-evaluation of others, because of their logical interconnections—the logical laws being in turn simply certain further statements of the system. . . . But the total field is so underdetermined by its boundary conditions, experience, that there is much latitude of choice as to what statements to re-evaluate in the light of any single contrary experience. No particular experiences are linked with any particular statements in the interior of the field, except indirectly through considerations of equilibrium affecting the field as a whole.⁴



Apart from the picture, Quine’s “holist” theory of knowledge differs in several important respects from foundationalism. First, there are no indubitable (unrevisable) beliefs. There were two different categories of beliefs that moderns tried to use this way—deliverances of sense perception and quasi-metaphysical deliverances of “reason.” For Quine there are no *sharp* distinctions among types of belief, but there are degrees of differences in how far a belief is from the experiential boundary. It turns out that beliefs nearest the edge and beliefs furthest from the edge are both resistant to change. Those near the interior (where metaphysical assumptions would go) are resistant to change because they are so thoroughly interconnected with the rest of the

content of the web. Beliefs near the edge are resistant to change because they are closely associated with experiences—unless, of course, new and surprising experiences come along. But when they do, there are always numerous ways to restore consistency. We may, for instance revise theory (a kind of belief located toward the interior) in light of new and surprising data; or we might instead use the entrenched theory to argue that something must have been wrong with the experiment. So there is no special category of beliefs that serve as an unquestioned starting point for justifying all the rest.

This relates to a second important difference from foundationalist epistemology. For foundationalists, reasoning (construction) goes in only one direction—up from the foundation. For holists there is no preferred direction. We may, as suggested above, use data from the edge to argue against a theory; we might instead use that theory to argue in the opposite direction—for the rejection of the data. One belief within the web may be supported by the fact that it *follows* from a set of premises. But each of the premises may also be justified by the fact that we need to *presuppose* it to support a conclusion we do not want to reject.

The kinds of connections among beliefs in the web are many: strict logical implication, weaker probabilistic arguments, arguments “forward” to further conclusions; arguments “backwards” to presuppositions. In general, what “holism” means is that each belief is supported by its ties to its neighboring beliefs, and ultimately, to the whole; the criterion of truth is coherence.

Ronald Thiemann is probably the best example of a theologian whose methodology reflects holist epistemology. He says that:

nonfoundational or holist justification is not a matter of devising a universal theoretical defense of Christian language-as-such or of discerning the causal relation between our concepts and their external referents. Holist justification consists, rather, in seeking the relation between a disputed belief and the web of interrelated beliefs within which it rests. Holism understands justification as a process of rational persuasion. “We convince someone of something by appealing to beliefs he already holds and by combining these to induce further beliefs in him, step by step, until the belief we wanted finally to inculcate in him is inculcated.”⁵

III. THE POSTMODERN APOLOGETIC PROBLEM

Modern thinkers’ thorn in the flesh was skepticism. If a foundation could not be found, or if construction failed, there could be no knowledge. For postmoderns, the constant threat is relativism. It shows up in comments on Thomas Kuhn’s philosophy of science, where he is accused of presenting an irrationalist account of science. It shows up in responses to Alasdair MacIntyre’s ethics, where he is accused of sanctioning moral relativism. It shows up in literary and textual criticism, in claims that there are as many meanings of a text as there are interpreters.

One way of raising the worry is this: Quine seems to have given us only a web-dependent, web-relative definition of truth. We can judge the truth of one belief (or of a relatively small set of beliefs) by its consistency with the rest. But we want the answer to a bigger problem: we picture *our* web of beliefs, bounded by *our* experiences. We picture alongside it other communities' webs and other worlds of experience. So how do we know that our web is true, rather than some other competing, perhaps equally coherent web. There they all are before us. We must choose. On what basis can we justify the choice of *this* web rather than that one?

Wittgenstein warns us not to be misled by mental pictures. Was not the picture of knowledge as a building the source of much misbegotten philosophical flailing about? Is the picture of competing webs likewise misleading? Quine would answer "yes." We never stand outside our total knowledge system—there *is* no such place to stand. So alongside the picture of the web, we need another corrective picture. Quine suggests that, with regard to our knowledge, we are on a ship at sea. We cannot rebuild the whole thing at once—we can only make small repairs here and there, keeping the rest intact in order to keep ourselves afloat. Or—to extend the metaphor a bit—we cannot walk on water; we cannot jump ship to examine it from the outside and compare it to all the other ships at sea. We cannot judge them all from the outside on the basis of some universal standards.

To put this point in plain language, it is impossible to call all of one's beliefs into question at once. This may be a psychological truth—doubting *everything* is one road to madness. But more important, it is an epistemological truth. Particular beliefs may *reasonably* be doubted only with good reason (an informative tautology?). To have good reasons is to assume certain propositions to be true. So, for example, Descartes's most thoroughgoing doubt was based on his argument from dreams. But he did not notice that he had to assume a great deal about human sleep experiences to make the argument work. Furthermore, he had to make assumptions about *language*. To raise doubts, he had to use a common language, assume constancy of meaning. Along with language comes a number of assumptions about reality that are built into the use of the words. And so in his argument for the existence of God, he traded upon the fact that within his linguistic community it was a part of the meaning of "cause" that a cause must have at least as much reality as its effect.

So the idea that we must somehow justify the whole of our web of beliefs is either a holdover from foundationalist thinking or else an illusion created by a mental picture. We cannot do so, and therefore we need not do so.

Now, when Quine speaks of knowledge, he means to include science, primarily, and logic, and everyday knowledge of the physical world. I do not think he means to include religious belief or theology. But for Christians this is a significant part of our web, of our worldview. The problem for Christian apologetics is that the antirealist arguments alluded to above do not work here. We know that it *is* possible to call the whole of Christian belief into question without disturbing much of the rest of the web

since we live our lives in the company of those who have done so. Our agnostic and atheistic friends seem to get along quite well with Christianity excised from their worldviews. It also seems possible to replace Christianity with some other set of religious beliefs, leaving the rest intact.

So it appears that, even if it is not possible or necessary to justify the Western scientific worldview, it *is* necessary to justify the inclusion of Christianity within that web of beliefs.⁶ But is it possible, and if so, how? Answering the "how" question is easy if we accept the postmodern account of knowledge. As with any other belief or subset of beliefs, justification consists in seeking relations between the disputed beliefs and parts of the web that we have no good reason to doubt.

This brings me to my main point: the two predominant views in the modern period on the relation between theology and science (the two-worlds view and the conflict model) have each in its own way served to insulate theology from science—the very part of the web that, as a whole, is least likely to be called into question. *The* apologetic task for the present is to attempt to repair the damage done by these two misguided views of the relation. This means rebuilding logical connections between Christianity and science in order to show that Christianity is not merely an optional addition to Western thought.

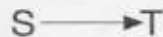
In practical terms, this means that scholarship by the likes of the contributors to this book, and courses like the ones they teach, fulfill to a great extent the role old-fashioned apologetics courses did in other times. Research and teaching at the intersection of theology and the natural sciences are not optional additions to the theological curriculum.

IV. IS IT POSSIBLE?

I raised the question earlier whether it is possible in postmodern terms to justify the inclusion of Christian theology within the Western scientific worldview. The best evidence for possibility, of course, is actuality. So in this section I want to reflect on some of the connections we can see between theology and science. This will not be an exhaustive list of the areas where fruitful work has been done. Rather, I shall select examples from recent writings—including the case studies in Part III of this book—that illustrate the variety of ways theology and science can be related. In the process, I want to show that one question that has been debated in theology-and-science circles can now be settled—namely, the question of the *kind* of relations we should look for between theology and science; for example, should theology and science be merely consonant, or should we look for evidential relations between the two? Should they relate directly or via a philosophical bridge? The answer is: we should seek any kind of relation we can get! In effect, with a holist epistemological model, any logical relation between a theological belief and another part of the web *is* an evidential relation.

Direct Implication

The simplest relation between theology and science is direct implication, and we find an example of this in William Stoeger's discussion of quantum cosmologies in the first case study of Part III. There he points out that the universe may not have had a *beginning* in the ordinary sense of the word. The direct consequence for theology, if one of these cosmologies is eventually confirmed, is that there could have been no *creation event*. This means that certain avenues of thought in explicating the doctrine of creation would be closed. Many have assumed that the doctrine of creation is a doctrine about the beginning of things and about the temporal finitude of the universe; others have emphasized instead that it is a doctrine about the dependence of all things on God. The acceptance of a quantum cosmology would rule out any interpretation of creation as a doctrine about the temporal beginning of the universe, and would necessarily shift attention to the metaphysical question of *ultimate* origins. Using *S* to mean science and *T* theology, I will represent this type of relation as:



Mutual Implication of Philosophical Theories

In a conference on quantum cosmology and time, Robert Russell presented an argument that exemplifies another type of relation between theology and science.⁷ Russell's claim was that if one of these cosmological theories is accepted, it follows that we need a much more complex view of the nature of time than has previously been supposed. Russell's paper argued that some theological views (Barth's in particular) already involve a suitably rich concept of time, arising out of consideration of God's relation to temporality. So here the relation between theology and science is not direct. Rather, a particular view in science and a particular view in theology each shape a philosophical theory (about the nature of time), and these philosophical positions turn out to be the same or highly congruent. Using *P*, *P1*, and *P2* to mean philosophical positions, I will represent this relation as follows:

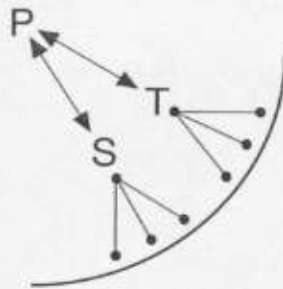


I have come to think that this is a very common sort of relation in the field of theology and science. That this is the case is not surprising if we consider the place of philosophy in a holist view of knowledge.

One of the main motivations for Quine's holist theory of knowledge was his objection

to the view that knowledge could be distinguished into two types: analytic and synthetic, or conceptual and empirical. This was one of the "two dogmas of empiricism" that he dismantled in his landmark article by that name. Philosophy, of course, was supposed to belong on the analytic or conceptual side of this distinction. A major tenet of holist epistemology is that philosophical knowledge is different from scientific knowledge only in degree—that is, only as a matter of its relative distance from experience. In metaphorical terms, it falls near the center of the web.

What we are doing here, in this exploration of a holist account of the relations between science and theology, is asking where theology fits in the web of beliefs, and how it is interwoven with scientific beliefs. It makes a great deal of sense, with this picture in mind, to expect that a scientific theory and a theological theory, each located about midway between the edge and the center, would turn out to be connected to certain central (philosophical) beliefs. So placing this relation in its context in the web, using the earlier notation, we get:



Another example of theology and science each implying a more central philosophical position is found in Stoeger's reference to the impact of quantum physics on epistemology. The fact that, at the quantum level, observation of a system inevitably interacts with and changes the system shows that the modern ideal of objectivity is inherently unattainable. Stoeger says that the repercussions on theology have been and are serious. I would prefer to put the matter differently. Theologians have been aware for much longer than scientists of the interactive character of knowledge. For example, the interpretation of a text never occurs in a vacuum; its meaning is partially constituted by the linguistic context in which it is read. It is fascinating to see the congruence between epistemological conclusions drawn from current philosophy of science on one side, and textual criticism on the other.

Hypothetico-Deductive Relations

I want to look now at another of the scientific areas that has important points of contact with theology. From Stoeger's paper of Part III below, we learn that our universe seems peculiarly hospitable towards life and consciousness. This is because of what is sometimes called the fine-tuning of the laws of nature. That is, calculations show that a number of factors at the beginning or very early in the history of the universe had to

Conclusions from Combining Science and Theology

I want to draw a further conclusion from the fine-tuning of the universe, but first I need to revert to Quinian holism. I have already spoken of Quine's demolition of the analytic-synthetic distinction. Another modern dogma has been the distinction between facts and values, or between what is and what ought to be. Quine's holism erases this distinction as well. I cannot make the argument for this here, but will simply assume it, since I want to suggest briefly some ethical consequences that follow from combining the Christian (or Jewish or Islamic) doctrine of creation with the cosmology discussed in Stoeger's paper and again here with regard to fine-tuning.

Christians for many years have thought of the natural world as a stage for human life and history. As such, it was seen to have little intrinsic value to God. There was no strong theological tendency to counter those who took biblical language about dominion as license to exploit and destroy the environment. The cosmology we have just examined, however, highlights the interconnectedness of human life with its natural environment. We are the result of an unimaginably complex, finely-tuned, fifteen-billion-year process. A better analogy than that of actors on a stage to represent our relation to the natural world is to think of ourselves as fruit on a tree. Without the tree, without a healthy tree, we could not be here. Carl Sagan, for all his limitations as a theologian, makes the point nicely in saying that we are made of stardust. Immersion in the world of science, especially contemporary cosmology and astronomy, produces a sense of reverence for the natural world that may be a more effective deterrent to exploitation than any prudential calculations of dire future consequences.

But there is a second motive for environmental consciousness built into a theistic interpretation of contemporary cosmology. Let us think what the process of creation tells us about the character of the Creator: the immense time span speaks of the Creator's patience. True, a thousand years is as a day for God, but we still have to recognize a vast difference between the instantaneous creation that Christians assumed for many years, and the slow, painstaking process that current cosmology suggests.

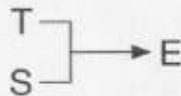
The point I wish to emphasize here is the great respect God seems to show for the integrity of the entities and processes that have been created. Diogenes Allen emphasizes that creation involves God's self-limitation—a withholding of divine power so that other things, things genuinely distinct from God, can exist.

When God creates, it means that he allows something to exist which is not himself. This requires an act of profound renunciation. He chooses out of love to permit something else to exist, something created to be itself and to exist by virtue of its own interest and value. God renounces his status as the only existent—he pulls himself back, so to speak, in order to give his creation room to exist for its own sake.¹⁰

This voluntary restraint, exercised for the sake of people *and things* out of respect for their reality, is grace. "The very creation of the world is an act of such grace."¹¹

The view that God withholds power to allow for free *human* actions is commonplace. It has long been recognized that God wants no coerced responses to divine initiatives. But (following Allen) I suggest that we must extend this view of divine self-limitation, speaking not only of free *will*, but (as John Polkinghorne does) of free *processes*, going right back to the very beginning of creation. God brings the universe into being with its inbuilt laws, initial conditions, and potentialities, and allows the entities and processes, as they unfold, to become (in Philip Hefner's terms) "created co-creators." God values and respects the integrity of each new order of being as it emerges.

There are obvious implications for our attitudes toward the natural world: a corresponding respect for nature with its intricate patterns and balances. If *E* signifies ethical attitudes, then this relation can be represented as follows:



Control Beliefs

I want to turn now to the previous work of a participant with me in the present debate, Nicholas Wolterstorff. In his book, *Reason Within the Bounds of Religion*, he argued for a method of relating theology and science that I believe has received too little attention in the theology and science discussion.

A crucial term in Wolterstorff's book is that of a "control belief." Scientific theories are never determined solely by the facts. This logical gap between theory and data indicates that the weighing of theories must involve other considerations. Wolterstorff suggests that one of these other considerations is beliefs as to what constitutes an acceptable *sort* of theory of the matter under consideration.

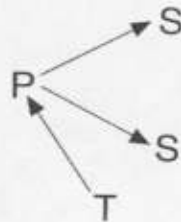
We can call these *control* beliefs. They include beliefs about the requisite logical or aesthetic structure of a theory, beliefs about the entities to whose existence a theory may correctly commit us, and the like. Control beliefs function in two ways. Because we hold them we are led to *reject* . . . certain sorts of theories—some because they are inconsistent with those beliefs; others because, though consistent with our control beliefs, they do not comport well with those beliefs. On the other hand control beliefs also lead us to *devise* theories. We want theories that are consistent with our control beliefs.¹²

Wolterstorff points out that control beliefs can be derived from either theological or philosophical positions. His examples show that some have had a positive effect in science, and some have inhibited its progress. For example, Descartes allowed his philosophical control belief that there can be no action at a distance to prevent him from accepting Newton's theory of gravitation. Ernst Mach held a philosophical control

belief that prohibited theories postulating nonsensory entities. This led him to reject many theories of his day but also to begin to reconstruct physics on a new basis.

These two examples illustrate the effects of philosophical control beliefs on the progress of science. Our interest is in the relations between science and theology, and so our concern here is with theological control beliefs and their function in science.¹³ David Griffin presented a paper to the Pacific Coast Theological Society in 1993 that provides a nice example of a theological control belief that functioned positively in the history of science.¹⁴ He argued that Newton's view of matter as inert represented a choice not only against the Aristotelian worldview, but also against a neo-Platonic, spiritualist tradition, and that his motives were in large part theological: the spiritualist tradition did not maintain a suitable distinction between the Creator and the creature; it gave away some of God's power to the material world.

So here we have an example (although an outdated one) in which theology has implications for science—not directly, but via presuppositions about what matter must be like, and consequently about the kind of theories one ought to pursue in science. In the notation already introduced, perhaps this relation can be represented as follows:



I want to turn the tables, now, and consider an extension of Wolterstorff's thought—namely, the possibility that science provides control beliefs for theologians. Ironically, the worldview that Newton did so much to establish (with the best of theological motives) has turned out to be extremely inhospitable to theology. It is a worldview of rigidly determined natural processes, wherein it is difficult to make sense of God's continuing involvement. I believe that much of modern theology has been shaped by a control belief based on this deterministic worldview: theological theories cannot postulate supernatural interference in the natural order. Rudolf Bultmann is probably the clearest example here, but we find the same control functioning in Langdon Gilkey's critique of biblical theology, in Maurice Wiles's discussion of God's action in the world, and countless other theologians.

A number of contributors to this volume are participants in a series of conferences on God's action in the world in light of assorted developments in contemporary science. The first was on quantum cosmologies and fine-tuning; the second was on chaos. The general topic of God's action was chosen because, in our view, modern science had made this issue problematic; thus, it would be possible to have a major impact on theology by showing how science had changed in this regard, and by asking what these changes entailed

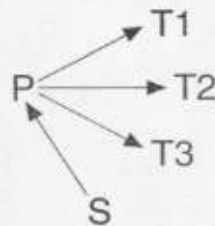
for God's action. Another way to put it is that we believe the modern control belief regarding God's action must be revised in light of more recent developments in science.

So far it appears to me that Arthur Peacocke's work represents the best revision in this way of the scientific worldview and its relation to God.¹⁵ For Peacocke, the sciences can be organized into a hierarchy so that higher sciences study higher orders of complexity or broader and more inclusive systems. The modern worldview typically affirms such an organization. However, the modern worldview is reductionistic, and causation is always from the bottom up. That is, all entities at higher levels are ultimately composed of the simplest entities at the level of physics, and thus the laws of physics ultimately govern all higher-level processes.

However, this reductionistic view of causation has turned out to be inadequate; processes at one level of the hierarchy can often be explained completely only by invoking causal factors from both below and above. The environment (the more complex and therefore higher system) has a causal impact on the entities within it; and so one cannot predict the entity's behavior merely by analyzing its parts.

Thus, Peacocke argues that we must make room in our worldview for "top-down" causation. In addition, he points out, the most complex system—the top of the hierarchy—is the system of God in relation to the entire universe. Consequently God's action in the world can be conceived of as an instance of top-down causation. Peacocke holds a panentheist view of God: God transcends the world, yet the world is also *in* God, who influences it in a manner similar to the influence of any environment on the entities it contains.

So we have in Peacocke's work the beginning of a new vision of God's relation to the universe, derived from science, and from which new control beliefs for theology can be developed. No longer will theological theorizing be restricted by the view that limits God's action to creation in the beginning or irrational sorts of interventions in natural processes. It is difficult to imagine, at this point, the extent to which theology might be changed by means of this indirect interaction with science. Returning to our notation, I suppose the relation here could be represented as:



Complex Interactions

Another kind of relation appears in David Cole's contribution to the fifth case study of Part III. The issues of predestination and free will are complex, and I am going to begin with the simpler issue of determinism.

Throughout Christian history, Christians have experienced the gospel and the Spirit

of God as liberators—liberation from fate or the stars; liberation from bondage to the material order. So there are two questions about human freedom: (1) Considered purely from the natural point of view (apart from the action of God), are human beings free, determined, or somewhere in between? The Pelagian controversy had to do with this issue—Pelagius saying we had a measure of freedom that we could use to extricate ourselves from sin; Augustine arguing for complete bondage to sin. (2) The second question is about the impact of God's grace, or the Spirit, or the gospel in our lives. One way of answering the question is to emphasize Christian liberty. But, paradoxically, Augustine and his followers have spoken of the liberating power of God's grace, which gives us the ability to choose the good, in ways that make it sound like a new version of determinism. God chooses those who will be gifted with freedom from sin; therefore God determines that some will be saved (or lost).

Cole's paper on genetic determinism versus the self-determining effects of memory could be interpreted as a contribution to question one: Considered apart from God, are our actions free or determined? His conclusion: our actions are not entirely free, but not strictly determined by genetics either. Framing the issue this way, we have another instance of theology and science related via a philosophical position—the view that human beings possess limited free will.

I think there is a better theological use to be made of Cole's discussion, however. I have just discussed Peacocke's theory of top-down causation, and the opportunities it presents for understanding God's action. Let us look at the matter this way. The human person can be considered from the perspective of a number of levels in the hierarchy of the sciences. The genetic level is one of these; the neurological level another; and the conscious or intelligent level a third. With the top-down view of causation, the most reasonable way to understand divine influence in human life is at the level of human consciousness—or in more traditional language, by means of the *word*. From the very beginning in Christian thought, there has been an appreciation for the liberating effects of God's revelation, coupled with a view of human behavior as determined in one way or another from below. Cole's account of how consciousness interacts with genetic determination can be used to describe at least a part of the *modus operandi* of the counterdeterministic influence of God's action. God's message affects human consciousness which, in top-down fashion, interacts with and mitigates bottom-up causal factors.

So we have here a fairly complex interaction between theology and science. Numerous results from several different sciences have suggested the hierarchical ordering of reality according to levels of complexity and the notion of top-down causation (theses belonging to the realm of philosophy). Theology contributes a top level to this hierarchy, along with the belief that human life is open (at the top, we might say) to divine influences. And finally, Cole's scientific analysis contributes to our understanding, in concrete terms, of how these divine influences are possible without violating the laws of nature. (I'm not going to try to diagram this one).

V. CONCLUSION

Let me sum up. I began by introducing a postmodern, holist theory of knowledge, and argued that Christian apologists must adopt a new strategy in its light: they must proceed not by attempting to find indubitable premises from which Christian beliefs follow, but rather by showing that the Christian belief system is well connected to the rest of the web. I then proceeded to describe some of the connections that have been drawn by a variety of people, including contributors to this volume. Still others could have been mentioned, but these provided a nice illustration of the variety of kinds of connections that are possible: direct implication of theological conclusion from scientific theories; mutual implication of a philosophical position by both theology and science; ethical implications drawn from a union of theological and scientific theories; arguments from science to a theological conclusion via hypothetico-deductive reasoning; control beliefs for scientific theories drawn from theology; control beliefs for theological theories drawn from science; and, finally, complex combinations of such relations. (Note that in light of this epistemological model, there is no reason that scientific conclusions cannot be suggested and weakly supported by theological theories.)

I want to end by noting that Ian Barbour has argued for caution in making the sorts of connections between science and theology that I have described and advocated here. The worry is that science changes—and often changes rather rapidly. Insofar as theology is justified by ties to science, it is setting itself up for rejection when the science changes. I have two replies: certainly theologians must not jump the gun and use scientific ideas that are still highly speculative. When we speak of the web of beliefs, we must not think of it as the beliefs of one or several individuals, but rather of the community. Only conclusions that are widely accepted by the relevant experts merit inclusion.

But, second, it is unnecessary and inappropriate to be any more defensive about theological theories than any other kind. Theology ought to be expected to change along with the rest of our dim and faltering knowledge. The web model helps here. Theology does not rest in any case on a scientific foundation such that a change in science brings the whole tumbling down. Each theological belief is tied to a number of other beliefs—some theological, some experiential, and (ideally) some scientific. When one support is lost, or when an inconsistency arises, there will always be a number of ways to revise and repair the web. So the task of relating theology to science will never be finished—it is bound to be an ongoing job, and there will surely be disappointments, but has not that been the lot of theologians and apologists from the beginning?

NOTES

1. See for example, William Placher, *Unapologetic Theology: A Christian Voice in a Pluralistic Conversation* (Louisville: Westminster/John Knox Press, 1989); Paul Griffiths, *An Apology for Apologetics: A Study in the Logic of Interreligious Dialogue* (Maryknoll: Orbis Books, 1991);

- William Werpehowsky, "Ad Hoc Apologetics," in *Journal of Religion* 66 (July, 1986), pp. 282-301.
2. James Wm. McClendon, Jr. and Nancey Murphy, "Distinguishing Modern and Postmodern Theologies," *Modern Theology*, April, 1989.
 3. E.J. Carnell, *The Case for Orthodox Theology* (Philadelphia: Westminster Press, 1959), p. 82.
 4. Willard V.O. Quine, "Two Dogmas of Empiricism," in *From a Logical Point of View: 9 Logico-Philosophical Essays* (Cambridge: Harvard University Press, 1953), pp. 42-43; the essay was originally published in 1951.
 5. Ronald Thiemann, *Revelation and Theology* (Notre Dame: University of Notre Dame Press, 1985), pp. 75-76. The last sentence is a quotation from Quine and J.S. Ullian, *The Web of Belief* (New York: Random House, 1970), p. 127.
 6. My main point of disagreement with postmodern theologians such as Lindbeck and Thiemann is their conclusion that Christianity needs no such justification.
 7. Presentation by Robert John Russell, Castel Gandolfo, Vatican City State, September 22-27, 1991.
 8. Two prominent books are J. Barrow and F. Tipler, *The Anthropic Cosmological Principle* (Oxford: Clarendon Press; New York: Oxford University Press, 1986); and John Leslie, *Universes* (London and New York: Routledge and Kegan Paul, 1989).
 9. See my "Evidence of Design in the Fine-Tuning of the Universe," in Robert John Russell, Nancey Murphy, and C.J. Isham, eds., *Quantum Cosmology and the Laws of Nature: Scientific Perspectives on Divine Action* (Vatican City State: Vatican Observatory, and Berkeley: The Center for Theology and the Natural Sciences, 1993), pp. 407-435.
 10. Diogenes Allen, *The Traces of God in a Frequently Hostile World* (Cambridge, Massachusetts: Cowley, 1981), p. 35.
 11. *Traces of God*, p. 36.
 12. Nicholas Wolterstorff, *Reason Within the Bounds of Religion*, 2nd enlarged ed. (Grand Rapids: Eerdmans, 1984), pp. 67-68.
 13. Wolterstorff gives an example of a theological control belief that functioned negatively, but none that functioned positively.
 14. David Ray Griffin, "Theology and the Rise of Modern Science," paper presented at the Spring Meeting of the Pacific Coast Theological Society, April, 1993, in Berkeley, CA. See also Eugene Klaaren, *Religious Origins of Modern Science* (Grand Rapids: Eerdmans, 1977).
 15. See especially, *Creation and the World of Science* (Oxford: Clarendon Press, 1979), and *Theology for a Scientific Age: Being and Becoming Natural and Divine* (Oxford: Basil Blackwell, 1990; expanded ed., 1993).