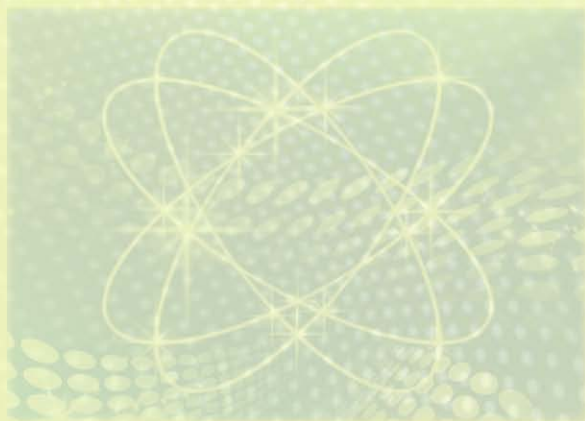


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# RELIGIOUS VOICES COUNT: THE NEW OPENNESS TO SPIRITUAL QUESTIONS IN THE SCIENCES

—BY PHILIP CLAYTON

**T**HE DAY is not long past when the words “contemporary science” sent shudders down the spines of theologians. After all, hasn’t science been the source of most of the major criticisms of theology in the modern period? Whenever one turned around, it seemed, another scientific salvo was being fired off against the pillars of theism. On this view, it was science that wrestled design and purpose away from the biological world, science that eliminated any place for divine action; science after Einstein that encouraged “relativistic” thinking, brought about the demise of absolute space and time, even taught the relativity of space to mass.

Indeed, it hasn’t been many years since Bertrand Russell’s famous attacks on religious knowledge: “A religious creed differs from a scientific theory in claiming to embody eternal and absolutely certain truth, whereas science is always tentative, expecting that modifications in its present theories will sooner or later be found necessary... Science thus encourages abandonment of the search for absolute truth...”<sup>1</sup> One immediately notes Russell’s unstated conclusion: therefore science encourages the abandonment of religion. For, Russell thought, whereas science is a matter of careful observation,

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THE SCIENCES

1 See Bertrand Russell, *Religion and Science* (New York: Oxford University Press, 1961), p. 14. The following references in the text are to this work.



and analysis, religion rests primarily on an illicit appeal to authority. When asked about God and immortality, Russell said, “My own belief is that science cannot either prove or disprove [these ideas] at present, and that no method *outside science* exists for proving or disproving *anything*” (p. 145, my italics). For “the sense of mystery, of a friendly or hostile non-human force, plays a far greater part in the life of savages than in that of civilized men” (p. 214). Was Bertrand Russell’s confidence in science and his dismissive attitude toward religion justified?

It also hasn’t been so many years since scientific standards for knowledge were said to challenge not only the probability of religious truth claims, *but even their very meaningfulness*. For the last generation of theologians, “the falsification debate” (the so-called university debate) was a centerpiece of the philosophy of religion and A. J. Ayer the critic with whom everyone had to wrestle. You may recall the famous parable, told by John Wisdom, of the man who found a garden in the forest and insisted that it must therefore have a gardener, even though the gardener could never be heard, seen, or detected in any fashion whatsoever. Here’s the moral of the story as summarized by the atheist critic Anthony Flew: “Just how does what you call an invisible, intangible, eternally elusive gardener differ from an imaginary gardener, or even from no gardener at all?” Flew threw down the gauntlet to theism: “Just what would have to happen not merely (morally and wrongly) to tempt but also (logically and rightly) to entitle us to say, ‘God does not love us,’ or even, ‘God does not exist?’ He thus put to theologians the question, ‘What would have to occur, or to have occurred, to constitute for you a disproof of, or the existence of, God?’”<sup>1</sup>

The premise of this paper is that proof and disproof no longer represent the entrance gates to religious reflection. A number of transformations in culture, in the theory of

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1 Quoted from Baruch Brody, ed., *Readings in the Philosophy of Religion: An Analytic Approach*, 1st ed. (Englewood Cliffs: Prentice Hall, 1974), p. 310.



knowledge, and in the philosophy of language have dissolved the old worry that religious language is meaningless (in the strictest sense of the word) unless it's empirically falsifiable. If there were time, we could explore in detail the central changes that have led to a new openness to spiritual questions, and thus to a new dialogue between religion and science. They include the following seven factors, each of which is worthy of an article of its own: the abandonment of the myth that science is a value-free activity which produces objective truths about the natural world; a growing frustration with the consequences of rampant materialism; new reservations about humanism in light of the evil that man has wrought upon man and woman in the wars of this century; a dissatisfaction with purely physical accounts of reality, accounts that are inadequate to explain human existence as we know it; the growing urgency of environmental problems and the concomitant need for a shared moral basis for responding to them; an increased interest in "spirituality" throughout our culture today; and finally, the urgent need to form an integrated view of the human person, perhaps prompted in part by the impending millennium. The net result of these seven changes is a new openness to spiritual questions within, and at the boundary lines, of the sciences. As one author has written,

*It [humanity] cannot fly with one wing alone. If it tries to fly with the wing of religion alone, it will land in the quagmire of superstition, and if it tries to fly with the wing of science alone, it will end in the despairing slew of materialism.*<sup>1</sup>

All this is a far cry from the proud proclamation in 1954 by Hans Reichenbach that humanity stands before a full scientific objective account of the world and a fully "scientific philosophy"!<sup>2</sup>

1 source unknown.

2 Hans Reichenbach, *The Rise of Scientific Philosophy* (Berkeley: Univ. of California Press, 1951).



How radical has the change been? Is knowledge in physics now on a par with psychology—or voodoo—as radical philosophers of science such as Paul Feyerabend have urged? Some thinkers have used the term *postmodern* to characterize this new and unexpected friendship between science and theology (e.g., Nancey Murphy has been an outspoken advocate of this view). But I do not think that this term is well chosen or the radical demotions of science justified. For one, isn't a broad and complex cultural movement such as "modernity" inherently too rich to be fully captured by a single label or a single set of three oppositions (pre-modern, modern and postmodern)? Further, I think it can be shown that the power of the scientific method—data acquisition, theory formation, use of mathematical models, experiential design and replication, the power of prediction—tells against postmodern or relativistic theories of science.

In the end, real-world ambiguities set up a rather awkward dilemma for the would-be postmodernist. On the one hand, she could grant that a term like "modernity" is fuzzy, which would mean that there is no strict opposition between it and "postmodernity". The two concepts move in and out of each other, sometimes overlapping, sometimes standing in some tension, sometimes the one encompassing the other. But then we cannot treat them as exclusive options. On the other hand, the postmodernist could define her position strictly, say as a precise option within epistemology. But then she will have to give up the claim that the move from "modernism" to "postmodernity" is a *chronological* one, a label for a cultural change that has already taken place. Instead, if the terms represent two major options in the theory of knowledge, they will have to be debated as such; one can no longer hide behind the claim that the postmodern has simply *superseded* the modern. Finally, note that the terms "modernity" and "postmodernity" imply a dipolar opposition. But isn't it dipolar oppositions that postmodernists are trying to overcome? If you

are a “post-structuralist” and you believe that “all is in flux,” why would you then wish to resurrect dualistic oppositions at the (meta-) level of epistemologies?

Instead of obscuring the horizon with the dust of postmodernism, I have characterized the new, positive setting for religion/science discussions as the move to a “post-foundationalist” theory of knowledge. (This is the case I made at the opening of *God and Contemporary Science*.) The foundationalist metaphor involved building up from the bedrock of certainties—perhaps from indubitable sense data, perhaps from certain intuitions of absolutes, perhaps from the alleged objectivity of the scientific method. By contrast, postfoundationalist or coherence-based theories of knowledge utilize the metaphor of a web. In knowing, one always begins with her own web of beliefs, her self-conception (religious or otherwise), her “world,” and *then* moves outward to compare it to different perspectives, to alter it where it conflicts with experience, to consider criticisms and respond to them. In a previous treatment I labeled this the *fallibilist* approach to knowledge.<sup>1</sup>

Do you see the difference? If I’m right about postfoundationalism, one is not mistaken in starting with the set of multiple beliefs she now holds; it’s what you do afterwards that counts.<sup>2</sup> Postfoundationalism has the advantage of making clear that the chief change we have to deal with is a change in the theory of knowledge. Also, unlike the term postmodernity, which implies that the cultural epoch called modernity has been superseded, postfoundationalism can be debated without resolving the cultural questions, for example whether postfoundationalism is now the dominant cultural movement or whether our society has now actually left foundationalism behind. Thus Wentzel van Huyssteen argues in his book in postfoundationalism:

1 Clayton, *Explanation from Physics to Theology: An Essay in Rationality and Religion* (New Haven: Yale Univ. Press, 1989), e.g. chap. 2.

2 See Clayton, *God and Contemporary Science* (Grand Rapids: Eerdmans, 1997), chapter 1.







*The key to moving beyond [the epistemological problems in science and religion] lies not in radically opposing postmodern thought to modernity in a false dichotomy, but in realizing that postmodern thought shows itself precisely in the constant interrogation of foundationalist assumptions... Seen in this way, modern and postmodern thought are unthinkable apart from each other, and postmodernism is not simply modern thought coming to its end. In fact, when postmodern thought shows itself best in the interrogation of foundationalist assumptions, a fallibilist, experiential epistemology develops...<sup>1</sup>*

Up to this point we have considered certain cultural changes, and certain changes in the theory of knowledge, which together have brought science and theology face to face in recent years—like two former enemies rounding a corner and suddenly being confronted with one another at close range and with no escape. A third factor has contributed to the constructive dialogues that are occurring at colleges and universities across this country and around the world: a major change in the self-understanding of science and scientists that has reduced the antagonism that formerly defined science's relations with religion. I say "reduced" because some left-over antagonism still remains. Debates about science over the last 40 years have seen an attractive new mediating position arise out of what used to be a violent battle front between two major opposing views of science. The name *Karl Popper* was associated with the view that only when theories are decisively falsified in science can new ones take their place—hence with the view that science is purely objective. By contrast, the name *Thomas Kuhn* conveys the view that many nonrational factors gradually contribute to changes in scientific fashion, until a "conversion" (Kuhn's word) takes place: one scientific paradigm loses supporters and a new one comes to dominate "normal science."

Between the two views lies the (widely discussed) "research

1 Wentzel van Huyssteen, *Essays in Postfoundationalist Theology* (Grand Rapids: Eerdmans, 1997), p. 78.

programs” methodology of Imre Lakatos. Lakatos held that the natural world does tell for or against a group of theories, but only over time and with some uncertainty. He writes, “It is not that we propose a theory and Nature may shout NO; rather, we propose a maze of theories, [a research program,] and Nature may shout INCONSISTENT.” He later put it, “Nature may shout *no*, but human ingenuity... may always be able to shout louder.”<sup>1</sup> Research programs have their particular theoretical core, their predictions about the future, the type of research that they spawn. They cannot be falsified by running into problems with this or that specific theory, but the scientific community *can* tell, given sufficient time, whether a research program is progressing or degenerating. Lakatos’s theory of science is an excellent example of postfoundationalism. As van Huyssteen notes,

*So what’s the picture of science? In the end a holist epistemology... demands a broader intersubjective coherence that goes beyond the parameters of the experience and reflection of just the believing community.... Lakatos was right: We should indeed have criteria to help us choose between competing research programs.*<sup>2</sup>

If we find ourselves drawn to holist conclusions in epistemology, then let it not be an *insular* holism that confines itself to traditions but rather an *inclusivist* holism that applies the very best of human reasoning in the search for overarching agreements at the broadest level.

I still encounter students and colleagues who worry that postfoundationalism amounts to a sort of special pleading: are religious thinkers simply trying to lower the hurdle that they have to surmount so that more religious statements can pass as knowledge with a lower obligation for evidence? But the winds of change are fanned not only by religious thinkers



1 Imre Lakatos, *Philosophical Papers*, ed. J. Worrall and G. Currie (New York: Cambridge Univ. Press, 1978), vol. 1, pp. 45, 111.

2 van Huyssteen, pp. 87, 89.



and theologians; philosophers of science with no interest whatsoever in religion are equally emphatic in proclaiming the bankruptcy of older “positivistic” model of science. Neither inductive force nor the certainty of falsification ensures the rationality or “truth-indicativeness” of scientific theories. Historical, communal, and pragmatic factors influence theory choice; thus funding decisions of the National Science Foundation are not purely objective (in case you had any doubt!). Decisions between scientific theories are affected by numerous contextual factors, so that only over the long term and in retrospect can one decide on the most probable theory. Does all this make science relative, a product of fashion like the widening of cuffs or the shortening of skirts? No; indeed, one reason to avoid the postmodern label is to escape the flat-footed equation of scientific theories with cultural fashions.

As a result of these changes, the old dichotomies between scientific knowledge and religious thought have become suspect; we can no longer imagine a Grand Canyon forever dividing scientific from theological theories. Indeed, our culture, our environment, and our world cannot afford the separation either. I have argued that science does still justify a certain presumption in favor of naturalism, but it is now a *methodological* naturalism, a nuanced one, one that now leaves an exciting place for metaphysical and theological questions.

## The New Call for Metaphysics

This new understanding of science has left behind many of the old reasons for excluding metaphysical and theological reflection. Today many scientists, theologians and philosophers are proclaiming the need to build on the results of science and to think beyond them. Let us turn then to a more concrete question: what are some of the features of the natural world that call for theological reflection, and what might a constructive theology written in light of these factors look like? On the old model, in order to write such a theology one

would first have to look at the empirical evidence, infer the existence of theoretical objects (be they quarks or God), and accept nothing beyond what the evidence justified. On the postfoundationalist model, one can espouse theism (or another metaphysical view) without breaking any rules of evidence. Still, one must also take the input from science with the utmost seriousness. Theology now becomes *a quest for coherence*, an attempt to think one's religious belief together with the other beliefs she has reason to accept.

So what are the opportunities—but also the constraints and challenges to religious thinkers—opened up by recent science? I wish to focus on six in particular:

(1) Ours is a physical world characterized by an overwhelming degree of regularity. On the negative side, this means that a scientifically alert theology cannot simply begin with a series of interventions by God into the natural world. Miracles in the classical sense may be added as a sort of “lightning bolt from above” (as Karl Barth put it), recognizable only by faith, but they cannot be a part of a constructive theology developed in the fashion I am imagining. On the positive side, the world's regularity itself calls out for theological interpretation. What kind of a God is evoked by a natural world in which a surprisingly small number of natural laws gives rise to the beauty and complexity of the physical cosmos—not to mention to the exploding creativity of evolving life?

(2) What should we make theologically of the pervasively temporal nature of the universe? We find ourselves in a universe that is finite in extension and duration and that had a definite starting point in time (or, if Stephen Hawking is right, a universe that is finite and yet had *no* starting point in time). Whenever we look at thermodynamic events, we are presented with the ineluctable arrow of entropy, like a clock ticking toward an inevitable conclusion—a point in the distant but finite future at which all heat sources will burn out and physical interactions will decrease to almost zero, a “heat





death” of evenly distributed matter at a uniform temperature a few degrees above absolute zero. Or will the universe collapse back into a singularity, the so-called Big Crunch, in an apocalypse of unbelievable magnitude? What can we say theologically about a universe that is pervaded by change and bounded by such strict (and finite) limits?

(3) We see a universe that seems “fine-tuned” for the emergence of life. Recent books by Michael Behe and Michael Denton, among others, show how large a number of physical constants had to fall within an incredibly narrow range if life was to emerge at all (and obviously, they have, since it has). Biochemists such as Gerald Joyce and Jeffrey Bada at the Scripps Institution of Oceanography in San Diego, are arguing that, given the structure of the heavy elements, the arising of life, at least on earth, was not improbable. Bada argues that life began as a “boundaryless soup of replicating molecules”; only later did the first membranes arise by chance. And Joyce defines life as “a self-sustain[ing] chemical system capable of undergoing Darwinian evolution.”<sup>1</sup> If these biochemists are right, the boundary between living and nonliving things is much more porous than we thought in the past; the line between them is a hazy one, and motion across it can occur without direct divine intervention. What does this say about the nature of God and God’s intentions in creating the universe?

(4) It is a universe that seems to have a place for the conscious observer. Not only has the fine-tuning of variables made the arising of conscious beings if not inevitable then at least not surprising, but the “anthropic” principle proposed by Barrow and Tipler suggests that the appearance of conscious observers may have been a *necessary* feature of the physical universe. A major interpretation in quantum mechanics, the “Copenhagen” interpretation, requires an observer in order to resolve the probabilistic or “potential” state of quantum

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1 Reported in *New Scientist*, July 13, 1998.

mechanics. In its most extreme form—the form propounded for instance by John Wheeler at Princeton—the entire universe may have existed in a state of quantum potentiality until the point at which the first observer emerged, at which point it was retroactively resolved into macro-physical structures such as stars, planets, and the like. What do such theories say about the status of human subjects in the physical universe? And what is the role of *God* as observer in this world?

(5) The neo-Darwinian synthesis in evolutionary biology suggests a developmental process that is unstructured and unguided, a process in which one can speak of purposes only as fictions but not as facts. By a process of random variation such as genetic theory describes, and selective retention by the environment based on survival value, more and more complex life forms emerged. Theologians are divided in the face of this challenge. The more conservative response has been to challenge the science involved, either because it (allegedly) conflicts with biblical revelation, or—as in Phillip Johnson’s famous attack in *Darwin on Trial*—because neo-Darwinian evolutionary theory is allegedly inadequate on its own terms. But another group, to which I also belong, takes the task of theology to be *not* to challenge science on its own proper ground—the ground of empirical conclusions and well attested theories—but *to think theologically in light of scientific conclusions*.<sup>1</sup> Those of us in this second group hold that the significance of theism for biology lies not in introducing a series of distinct divine interventions, as in the six days of creation of Genesis, but rather in reflecting on the nature of a God who would use physical regularities and the contingencies of natural history to bring about certain divine purposes. The biological sciences reveal teeming creativity, the solving of complex “tasks” by a huge variety of attempts over a very long period of time,

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1 The exception to this rule is when scientists have begun to pronounce on theological questions outside of the competence of their empirical field of study.





and the contingency of the outcomes. (Biological evolution is radically contingent because another organism or structure might have attained equal survival value had it arisen, and the present “best solution” may become ill-adapted based on only minor changes in the environment, food chain, or balance between species.) And yet the whole process has clearly given rise to ever more complex life forms, including some capable of language, reasoning, self-consciousness, the pursuit of beauty, the concern with what they call right and wrong, and the use of moral predicates. What kind of a God would have chosen this route for achieving a conscious life form that is, as the Psalmist writes, “a little lower than the angels?”

(6) Finally, the explosion of progress in the neurosciences, spawned for example by better brain-scanning techniques, has begun to reveal a brain whose structure and functioning are capable of producing the most spiritual thought, feelings, and experiences. Far from the God of Descartes, who introduced into a clockwork physical universe a separate soul or spirit (*res cogitans*), which was responsible for all distinctively human behaviors, neuroscience today is only compatible with a God who has made every detail of mental functioning dependent on an extremely complex brain structure. The neurosciences do not, on my view, threaten to reduce the human mental life to “no more than” passing brain states, but they *do* require theologians to conceive a world in which what is distinctively human arises out of and depends upon underlying biological structures.

Each of these six areas represents a challenge for theology that arises out of contemporary science, and each can give rise to new and constructive reflection on the part of religious thinkers. Less obviously, perhaps, each one requires the development of mediating concepts that are able to link the scientific and religious worldviews in a meaningful fashion. Such linking concepts are, in the nature of the case, *meta-physical*. Their indispensability represents “the new call for metaphysics” that I mentioned above.

## Toward a Metaphysics of Emergence

It is, you can see, a fascinating time to be engaged in religion/science dialogue: the old epistemic hurdles have fallen, and our knowledge of the physical world is advancing by leaps and bounds. In the remaining minutes I would like to offer at least a sample of the sort of constructive work that is now called for, making use of one particular bridge concept: the metaphysics of emergence.<sup>1</sup> To what extent can this concept help to bridge the gap between recent scientific results and theistic belief?

Let's begin with the six features that I mentioned a moment ago. This physical story has one recurring feature that cries out for theological reflection: again and again higher (i.e., more complex) structures emerge out of the lower, less complex physical structures. The higher levels are dependent on the less complex levels that precede them, and yet they are not exhaustively explained by the lower levels. What arises in chemistry, in the study of the cell, or in higher organisms is genuinely new. As much as it depends on its substratum, it also brings something novel—new regularities, new structures, new causes, perhaps even new realities. Can we develop a metaphysics of emergence sufficient for expressing this empirical pattern? And is the structure of emergence consistent with traditional theological assertions about God and God's relation to the world?

On the model I propose, God is not a person but meta-personal. In an age when humans were viewed as little gods on earth—the only life form infused with an eternal soul, as Descartes thought—it was natural to conceive God as a person, like



1 The following comments draw on the position recently published in *God and Contemporary Science*. But they also move beyond that view to address some of the criticisms that have been raised during the few months since the book appeared. See e.g. the four critiques of my "The Case for Christian Panentheism," *Dialog* 37 (Summer 1998): 201–208, and my response to them, forthcoming in *Dialog* 38 (Summer 1999).





humans, yet not limited by a body or by mortality. Of course, Patristic theology already maintained that God was not a person, although the Godhead consisted of the three persons: Father, Son, and Spirit. Theologians insisted that, though the divine persons were *like personae*—a Latin notion far from equivalent to the 20th century idea of persons!—person language falls short of truly describing the divine. This point was driven home to modern philosophical theology by Fichte, who showed in 1799 that an infinite person is a contradiction in terms, and by Tillich’s well-known argument that God is not person but the Ground of personhood.<sup>1</sup> Most recently, increased knowledge of the hierarchical structure of the natural world—sufficient complexity of structure at one level leading to the emergence of genuinely new properties at the next higher level<sup>2</sup>—has given us further reason to conceive God as *trans*-personal. Whatever “emerges” out of and above the level of human persons must be *meta*-personal. (Note that “emerges” here refers initially only to the order of discovery; at least some aspect of divine reality must have preceded and been responsible for creation in the first place.)

Modern theology has not yet achieved consensus on a conceptual framework adequate for expressing the God-world relationship beyond the category of personhood, which most acknowledge is not fully adequate. If we are committed to doing “theology from below”, this failure matters. Theology from below entails searching for the most adequate parallels and concepts to make sense of religious beliefs. What *are* the best available options? In particular, isn’t it appropriate to take the highest level of emergence known to us and to use it as the

1 I have developed these ideas more fully in *Infinite and Perfect? The Problem of God in Modern Thought* (Grand Rapids: Eerdmans, 1999), chaps. 8 and 9 respectively.

2 See Arthur Peacocke, *Theology for a Scientific Age: Being and Becoming—Natural, Divine, and Human*, enlarged ed. (Minneapolis: Fortress, 1993).