

JOHN POLKINGHORNE: CROSSING THE DIVIDE BETWEEN PHYSICS AND METAPHYSICS

by Carl S. Helrich

Abstract. John Polkinghorne is a significant contributor to the religion and science dialogue, bringing the expertise of a scientist coupled with serious theological study, ordination, and service as a parish priest. He takes both theology and science with utmost seriousness and describes himself as a bottom-up thinker, confronting the scriptural record as a scientist does data. But he refrains from giving scientific explanations of scripture. Polkinghorne's concern is with hope, and specifically with eschatological hope. The framework for his theological thinking is the Nicene Creed, in which is found the counterintuitive openness common to theoretical physics. He acknowledges the need for thinking beyond the confines of present scientific understanding in proposing *active information* as a concept for considering the mind.

Keywords: active information; bottom-up thinking; eschatology; hope; Nicene Creed; quantum theory.

John Polkinghorne's thoughts and contributions to the science and theology dialogue have been a welcome and important addition. Polkinghorne brings to the dialogue the undisputed expertise of a reputable scientist coupled with the experience of serious theological study, ordination, and service as a parish priest. By his own confession, he does not possess the background necessary to be a first-class New Testament theologian. His rather quaint description of a wish granted by a fairy godmother gives an indication, however, of the love and respect he has for New Testament theology. His twenty-five years of experience in theoretical physics have an unavoidable influence on determining the subjects on which he concentrates as well as his method of approach. Here is the source of "bottom-up"

Carl S. Helrich is Professor of Physics and Chair of the Department of Physics, Goshen College, 1700 South Main Street, Goshen, IN 46526. His e-mail address is carlsh@goshen.edu.

[*Zygon*, vol. 35, no. 4 (December 2000).]

© 2000 by the Joint Publication Board of *Zygon*. ISSN 0591-2385

thinking, which defines a certain approach to the historical record. In this case, this is the scriptural record. Polkinghorne considers this record as a scientist would laboratory data, while taking both science and theology with the utmost seriousness. Any coloring on Polkinghorne's part is based on his own history. Worth noting, and part of the reason that his efforts are so welcome, is that Polkinghorne does not attempt in any deep way to apply his expertise as a scientist to providing an explanation of the scriptural record. His interest in the New Testament record of the crucifixion and the resurrection of Jesus goes completely beyond a scientific interest. Polkinghorne's concern is with hope, and specifically with eschatological hope. What we find in John Polkinghorne, then, is one who brings the expertise of a scientist with a serious attitude toward theology and the biblical record motivated by a sincere desire to look at the basis of the Christian message as one of hope brought to us through the Crucifixion and the Resurrection.

The diversity of the world's faith traditions is a major source of perplexity for Polkinghorne. The problem is in the scale of the differences. Science, as he points out, does not have this diversity. The one possible exception is the fact that our interpretation of the quantum theory is not universal. Because this is a theme to which Polkinghorne often returns, we must seriously consider it when speaking of his contributions to our discussion. To this problem he offers no answers. But because of the centrality of the crucified and resurrected Christ in the Christian message, we must consider this as a true difficulty. The issue is particularly problematic to a theoretical physicist who is familiar with the consistent structure revealed in the universe. If this consistency is an indication of the faithfulness of God we expect to see a similar consistency in religious ideas. But we do not. Polkinghorne urges us not to succumb to our guilt but to enter the dialogue holding to the truths as we understand them. The dialogue, as he points out, will last for centuries.

The chapter "What Happened to the Human Mind?" in Polkinghorne's book *Beyond Science: The Wider Human Context* (1998) represents an important step to which Polkinghorne's thought about these deeper issues has naturally brought him. If we are to take theology and modern science seriously, we must encounter the question of the interaction of God with us. This leads to considerations of the human mind. In broad strokes this article is representative of Polkinghorne's writing. Polkinghorne outlines the ideas of others, pointing explicitly to their shortcomings, and then places his ideas on the table. In a scientific article this would be followed by the obligatory discussion in which the results presented are considered reflectively as a now completed step. But here Polkinghorne ends by clearly stating that the ideas are "pre-Socratic flailing about" and that the problem discussed is one for which we have no tools to solve. This is, of course, correct. Polkinghorne provides the perspective that our role is similar to

that of Thales of Miletus, whose ideas were premature to an understanding of matter. He believes that we should not refrain from “waving our hands” in this direction. But he does present a proposal, which anyone who has followed some of Polkinghorne’s ideas will recognize as the result of carefully developed thought (Polkinghorne 1997, 154). What he proposes is rooted in physics but is also metaphysical. The idea should not be lightly taken, even though it is undeveloped. What Polkinghorne proposes are the concepts of active information and a possible complementarity of the mental and the material. These have their origins in theoretical physics. But here Polkinghorne pushes them beyond what is presently known. What is presented is not an answer but an indication of a general direction. This again is typical of Polkinghorne. He presents his ideas as tentative but well thought out and open-ended.

As a scientist Polkinghorne speaks with an authority not all of us possess. This is particularly evident when he speaks about quantum theory and fundamental physics. Much of his work is flavored by references to the quantum theory, such as his comments in his summary of Wolfhart Pannenberg (Polkinghorne 1999). What Polkinghorne has to say regarding this most important of physical theories is particularly helpful, since many aspects of what quantum theory teaches us are of interest when we consider the relationship between theology and science. Quantum theory is counterintuitive. And quantum theory has implications regarding the relationship between epistemology and ontology. The phrase “epistemology models ontology” has become one of his favorites and can be found in many, if not most, of his writings. But Polkinghorne does not attempt to involve quantum theory in anything like a detailed development of a natural theology. Indeed, in his Gifford Lectures (Polkinghorne 1996, 21) he contends that the use of quantum mechanics in some instances, such as Penrose’s ideas about neuron function in the brain, has the effect of microscopic occasionalism where the situation of the world is decided moment by moment. The use of the quantum theory as a tool for understanding such deep problems as are encountered here is unwarranted, because the quantum theory itself is not understood. Anyone who has deeply engaged the quantum theory is aware that it is not the predictive power but the beautiful and rich structure and the sense of contact with the deep and counterintuitive mysteries of the universe that are the basis of its attraction for us.

It is this sort of rich structure and sense of the counterintuitive that Polkinghorne finds in the Nicene Creed. This is the framework for his theological thinking. As he points out, the Nicene Creed is spare and unburdened by elaboration on the salient points of the confession. This is important to a scientist living through and after the discoveries of the twentieth century. The rock that seems so solid beneath us may in fact be sand. The creed provides the basis of truth as experienced by the church and as

testified to by the New Testament writers. As Polkinghorne points out, the structure is such that each generation can make these truths its own by adding flesh to the skeleton. In this he acknowledges his respect for traditional understanding of the Christian faith. It is this rooting of himself in tradition that forms the basis for Polkinghorne's metaphysics.

The theoretical physicist is by nature cautious. We have learned that there are surprises and that we cannot trust our mental pictures of the universe. But the theoretician is the one to provide the bold proposal. Data from reliable sources can be trusted as can "the unreasonable effectiveness of mathematics," a phrase from Eugene Wigner that Polkinghorne quotes elsewhere (1995b, 37; 1995a, 341). Analogies and models may be helpful. But we must remember that they are only analogies and models and not reality. These characteristics of the theoretician are embodied in Polkinghorne's work, whether openly acknowledged or not. In much of his writing he provides analyses of explanatory efforts of others, or of certain attempts at developing theories, such as those of David Bohm (Polkinghorne 1995b, 26–28). In many cases Polkinghorne comes away "unpersuaded." This is completely in keeping with Polkinghorne's background as a scientist and particularly as a theoretical physicist. As to the bold proposal, in much of his work Polkinghorne demurs. This seems wise. Bold speculation is tempting when one calls for a theology of nature, as Polkinghorne does in his Gifford Lectures (1996, 44). But he declines to speculate regarding explicit mechanisms, such as in his discussion of the human mind. Indeed, in considering the action of God on us he is blunt in his criticism of any identification of something like a "causal joint." Such an identification makes God one of many competing causes. This stance, I believe, we should consider refreshing.

An example of what Polkinghorne calls bottom-up thinking is exhibited in his discussions of the man Jesus and Christology. In his Gifford Lectures, Polkinghorne says that he is driven to finding a new Christology adequate to the Christian experience of new life in Christ (1996, 142). But he cannot accept the primacy of the preached Christ over Jesus. He wants a mutually consistent picture. Christianity, says Polkinghorne, will never become all top with no bottom (1996, 102). It is in a search for the man, Jesus, that Polkinghorne exhibits in some detail what is meant by bottom-up thinking. He seeks to answer the question, What is the evidence that makes you think (what is being proposed) might be the case? The data are to be found in the scriptures and in the tradition of the church as well as in insight we have from our general understanding of the world. Then, in approaching the task as a scientist, he concentrates on what he believes are the important points, and he trusts his judgment. He claims that we must rely on judgment and not "devise procedures which ape a superficial notion of scientific method" (Polkinghorne 1996, 93). In this search Polkinghorne believes we can discern the powerful personality be-

hind the Gospels and the outstanding mind behind the parables. The search is narrowed to trying to find evidence for that powerful personality by sifting through the data and using judgment. In this he is prepared to chart his own course and to reject the evaluations of others if he considers their analyses unreasonable. Here Polkinghorne is seeking a theory. Theories, by their nature and the purpose they serve, are always underdetermined by the data. But our lives are lived by theories.

There is a driving force behind this search for a theory. Polkinghorne is concerned with hope. As he puts it, "If there is a true and lasting hope . . . then it can rest only in the eternal mercy and faithfulness of God" (1995b, 65). In Polkinghorne's evaluation this brings us into direct encounter with the resurrection. He provides, in many places, accounts of the data attesting to the resurrection, including the evaluation of Jewish theologians such as Pinchas Lapide (Polkinghorne 1996, 118). In his analysis Polkinghorne is careful not to attribute resurrection encounters to hallucination or unsubstantial visions, which are counter to the Jewish concept of the psychosomatic unity of the human being, the inseparability of body and spirit (1996, 116). The importance of the empty tomb is then in the reality of the resurrection, not as a proof of it. Polkinghorne cites again Lapide, who reminds us that the resurrection was a necessity not only as the vindication of Jesus but as a vindication of God, who, in raising Jesus, did not at last forsake the one who had so completely trusted (1996, 121). There is more here than vindication of the message. Polkinghorne, as a bottom-up thinker, begins with a description of the phenomena to determine the nature of the problem. He points out that the central issue is the experience of the Christian with Christ and the experience of salvation. The human condition, claims Polkinghorne, is such that it requires involvement. "We need participation, not illumination" (1996, 136).

There is an entire package here. We cannot accept only a part of it and not the totality. We cannot accept the man Jesus and his crucifixion without the resurrection and the concept of son of God. We must have an incarnational theology. Here Polkinghorne crafts his discussion carefully. As a bottom-up thinker he has only the data with which to work. But as a theoretical physicist he is completely aware of the fact that we each conceive of more. None of us wants to be so naive as to try to imagine individual molecules pushing on or grasping each other. That is not the correct picture. Polkinghorne speaks here about polarities such as the temporal and infinite poles of God. It seems appropriate to accept that he is doing exactly what he told us he would do. He has looked at the problem with us and shared his understanding. And then he says, "That is as far as a bottom-up thinker dares to go in speculating on such profound theological matters" (1996, 142).

Nevertheless, it is at this point that I encourage Polkinghorne to stay with us. He is critical at a number of points of the efforts of some in the

science-and-religion school to explain all on a scientific basis. And because God is infinite mystery, the critique is valid. We must realize that our subject is metaphysics and theology and not really physics. However, Polkinghorne leaves us at a great crevasse over which he seems to step lightly into a world in which the connection to hard data is very tenuous. It is at that crevasse that some of us will need to stay and labor. This is not necessarily because our theology is not quite right. It is because our science has not yet been completely expended.

This light stepping is found particularly in Polkinghorne's discussions of eschatology. As he admits, eschatology is a strange subject for a bottom-up thinker. But he believes that the task must be undertaken. In eschatology, he claims, lies the hope in the Christian message. Polkinghorne's hope is not in an intrinsic immortality but in death and resurrection. God in Christ has redeemed that life from the limitation and distortion of sin, and Jesus' resurrection is the ground for the hope and destiny that we all share (Polkinghorne 1995b, 56; 1996, 122). Hence, we must consider eschatology in order to speak about hope. In considerations of eschatology Polkinghorne outlines the cosmological difficulties. The blunt question is, How can we speak of eternity if we realize scientifically that either the universe will continue to expand or it will collapse? Neither of these provides the physical foundation for an eternity with hope. At this point most of us probably do leave science when we seek some understanding. It is to Polkinghorne's credit that, in principle, he stays with the program he has defined. He tries to stay with the data. But now the data are not historical. Here one encounters the "world to come" of the Nicene Creed. It is this with which Polkinghorne tries to come to grips.

In my critique of Polkinghorne on this, I am aware that we face here the issue of separation of science and theology. It is true that each of us holds to some metaphysics. In tying himself to data and to the Nicene Creed, Polkinghorne has done a service. He provides evidence that this is a direction separate from that pursued by many while adhering to a program that has proven fruitful. He also maintains respect for his predecessors in physics and in theology in taking their ideas seriously. In describing what may be meant by a new heaven and a new earth he takes scripture with "utmost seriousness," as should be the case in his program. But as a physicist, and perhaps as a Mennonite, I am left with a sense that again Polkinghorne has walked lightly over the deep crevasse, leaving many of us behind to toil.

In his ideas on what he calls "active information" Polkinghorne comes closest to what I am suggesting. He looks to the openness of chaotic systems as a source for the actualization of the ideas that seem close to his metaphysics and theology. It is logical that Polkinghorne should anticipate that a concept such as active information may result in the structures common to dissipative systems far from equilibrium. Such structures could also be integral in our understanding who we are, in spite of the changes in

our physical bodies that accompany life. However, while these concepts are very helpful, we should be aware of the great difficulties involved whenever we speak of “information” or “information theory.” We simply have, at this time, no comprehension of how to deal with information in the context of complex, nonequilibrium systems. In alluding to such concepts, Polkinghorne is not necessarily taking what Wolfgang Pauli called credits on the future, since he makes no predictions about what will be done. Indeed, he suspects that we will be involved in this study for centuries. These ideas may prove fruitful, and we can be grateful that Polkinghorne has stayed with us on the problem. Nevertheless, these are concepts about which we cannot yet speak clearly as physicists.

Polkinghorne has already defended himself against such criticism as I seem to have leveled here. He realizes that one cannot go from a physics to a metaphysics. He also states that the value of such ideas will be determined by whether they are fruitful or not. I agree. My words here are not criticism as much as an encouragement to stay with us on this side of the crevasse and engage the questions with all the tools we have at hand, which are not yet metaphysical.

REFERENCES

- Polkinghorne, John. 1995a. “The Quantum World.” In *Physics, Philosophy and Theology*, ed. Robert John Russell, William R. Stoeger, S.J., and George V. Coyne, S.J., 333–42. Vatican City State: Vatican Observatory Publications.
- . 1995b. *Serious Talk: Science and Religion in Dialogue*. Valley Forge, Pa.: Trinity Press International.
- . 1996. *The Faith of a Physicist: Reflections of a Bottom-up Thinker*. Minneapolis: Fortress Press.
- . 1997. “The Metaphysics of Divine Action.” In *Chaos and Complexity: Scientific Perspectives on Divine Action*, ed. Robert John Russell, Nancey Murphy, and Arthur R. Peacocke, 147–56. Vatican City State: Vatican Observatory Publications, and Berkeley: Center for Theology and the Natural Sciences.
- . 1998. *Beyond Science: The Wider Human Context*. Cambridge: Cambridge Univ. Press.
- . 1999. “Wolfhart Pannenberg’s Engagement with the Natural Sciences.” *Zygon: Journal of Religion and Science* 34 (March): 151–59.
- . 2000. “The Life and Works of a Bottom-up Thinker.” *Zygon: Journal of Religion and Science* 35 (December): 955–62.