

FIELDS AND THEOLOGY: A RESPONSE TO WOLFHART PANNENBERG

by John Polkinghorne

Abstract. In responding to Pannenberg's paper, "God as Spirit—and Natural Science," Polkinghorne challenges the paper's interpretation of the scientific concept of field. He insists on its physical, material nature, elaborated by quantum theory, and asserts that Pannenberg's concept of field is immaterial or even in some sense "spiritual." Polkinghorne also comments on how a physical theory may give rise to several differing, even contradictory, metaphysical interpretations.

Keywords: field; field as metaphorical; field as physical; metaphysics; quantum theory.

Of course, I agree with Wolfhart Pannenberg (2001, 783) that a dialogue between two disciplines, such as that between science and theology, has to involve discourse at a metalevel capable of embracing them both. One may consider this second-order place of meeting to be philosophy, without implying that the latter is in a position to be the independent arbiter of what the two first-order disciplines may have to say to each other. This caveat is necessary because the concepts used in the metadiscourse have to be controlled by their relevance to, and consonance with, the concepts of the primary disciplines.

In making this point I am having recourse to a strategy that I have called "bottom-up thinking" (Polkinghorne 1994, 4 and *passim*), in which general ideas emerge from the consideration of particulars. This strategy is to be contrasted with "top-down thinking," in which general ideas are accorded a degree of priority over particularities. I might venture to suggest

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that the latter is a style more characteristic of German thinking, while the former is a style more characteristic of Anglo-Saxon thinking.

The bottom-up approach may be illustrated by considering the relationship between physics and metaphysics. It is certainly the case that issues such as causality or the nature of space and time are ultimately matters for metaphysical decision. The point is made clearly enough in the case of causality by recalling that there are two empirically equivalent but ontologically conflicting interpretations of quantum theory, the one deterministic (Bohm) and the other indeterministic (Bohr). Metaphysics is not determined by physics alone but is certainly constrained by it. The relationship between the two levels of discourse is not one of logical entailment but of allogical consonance. Therefore, a variety of metaphysical edifices can be erected on the same physical foundations. I illustrated something of this possible variety when I considered four distinct metaphysical schemes of temporality and the theological positions naturally associated with them, each of which claimed a basis in the contemporary scientific understanding of the nature of time (Polkinghorne 2000, chap. 7).

Let me now look at the scientific concepts of field theory and how they might relate to metaphysical and theological concerns. The current accepted basis of fundamental physical theory is quantum field theory. All the basic entities considered by physics, whether radiation (photons and so on) or particles (quarks, gluons, and the like), are understood as being excitations in appropriate quantum fields. In more detailed terms, the fields currently known are those of the so-called Standard Model, but many theoretical physicists hope that the latter will turn out to be a kind of low-energy approximation to a more elegant and economic field theory, the so-called Grand Unified Theory. The alternative program that Einstein espoused, to which Pannenberg refers, in which particles were to be considered as “singularities of the cosmic field” (Pannenberg 2001, 790) did not succeed, and it has been abandoned. Fields, of course, are carriers of energy and momentum, and this is the basis of my criticism (Polkinghorne 1999, 154; 2000, 162) of regarding field theories as if they were immaterial or even, in some sense, “spiritual.” Pannenberg responds by telling us that “the concept of matter is not—like ‘mass’ is—a strictly physical concept, but a philosophical one” (p. 787). Maybe, but since all the physical entities of the universe are excitations in fields, it would be quixotic, to say the least, to leave the physical universe empty of matter because the metaphysicists had decreed that fields do not participate in the material.

When we consider the relevance of field theory to metaphysical questions of the nature of space and time, the matter becomes more complicated. This is because it is still an unsolved problem within physics how consistently to reconcile with each other quantum theory (fundamental to all quantum field theories) and general relativity (fundamental to space-time structure). The most promising line of approach seems to be in terms

of string theory and its generalizations (Greene 1999), but this is not wholly satisfactory, since it has to assume a priori the existence of the background space-time of special relativity. A final theory might be expected to yield macroscopic space and time as emergent properties of some more primitive substrate (see Polkinghorne 2000, 138–43).

A further metaphysical property of considerable significance to theologians, and one on which Pannenberg has laid particular stress, is contingency. I have emphasized that there is no natural consonant connection between field theory and contingency (Polkinghorne 1999, 155–57; 2000, 164–67). Pannenberg essentially concedes this when he acknowledges that classical fields carry no implications of contingent behavior (p. 791). The point is not really modified by the fact that quantum fields do exhibit contingent behavior, since this arises from their quantum, not their field theoretic, nature. I share with Pannenberg the desire to adopt a metaphysical position that accommodates open process in a world of contingency and allows time “to be taken seriously as a source of novelty” (p. 791). As I have discussed fairly extensively elsewhere (Polkinghorne 1998, chap. 3; 2000, chap. 6), I believe that the key to achieving this end is to be found in appropriate metaphysical interpretations of quantum theory and chaos theory and not in field theory as such.

So what role is there, then, for the idea of a field in theology? It does not seem that it can function as an explanatory concept that bears any consonant relation to the scientific meaning of the term. Rather, it has been used simply as a metaphorical way of signifying the immanent presence of God and the activity of the divine energies in the space and time of creation.

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