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# Science and Religion

## Two Approaches to Understanding Reality

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In 1962 Thomas S. Kuhn wrote a book, *The Structure of Scientific Revolutions*, that has been characterized as "the most influential book on the nature of science yet to be published in the twentieth century."<sup>1</sup> To facilitate his discussion of how science is done and how scientific progress happens, Kuhn introduced the concept of "paradigm" or "scientific world view." His analysis suggested that science is a human endeavor involving metaphysical commitments and value judgments that depend on community consensus.

The religious community has also been analyzed in terms of paradigms. The social, subjective, and value elements allowed by Kuhn seem to make room for such a discussion. This in turn seems to reinforce some of the characteristics of the scientific community, encourage dialogue between these communities and may provide guidelines for the integration of faith and learning.

We will review characteristics of Kuhn's paradigm and then consider its extension to religion or theology. This will allow us to compare and contrast science and religion, to note some similarities between them, and to highlight some distinctive differences that seem to be associated with their metaphysical assumptions and epistemological emphasis.

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### Kuhn's Paradigm

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In elaborating and refining the meaning of paradigm, Kuhn characterized it as consisting of *symbols* (such as equations and definitions), *metaphysical beliefs* (the nature of reality), *values* (simplicity and consistency, for example), and *exemplars* (problems

and examples in textbooks or laboratory experiments).<sup>2</sup> These exemplars serve to initiate the student into how to do science and eventually determine the way the scientist sees the world. Thus, according to Walsh and Middleton, the paradigm functions as the scientists' conceptual framework . . . It provides the criteria by which theories are judged, evidence is deemed admissible, the nature of the demonstration is determined, and the elements of a true conclusion are constituted.<sup>3</sup>

So it is shared paradigms that create the scientific community, which has common assumptions and channels of communication. A paradigm thus colors the scientific assumptions about the kinds of entities that exist (metaphysics) and the appropriate methods of inquiry (epistemology).

Kuhn departs from traditional science by (a) making values an important component of the paradigm, thereby planting human subjectivity firmly in the center of science,<sup>4</sup> and (b) by letting the validity of a theory reside in the judgment of the scientific community rather than in "objective" rules,<sup>5</sup> thereby introducing a strong social dimension into scientific knowledge.<sup>6</sup> He sees science as a decidedly human pursuit. In

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fact, Kuhn states in the postscript to the second edition of his book that, if he were writing the book again, he would "open with a discussion of the community structure of science."<sup>7</sup> For, he argues, scientific advances happen in a community that

transmits demands and aspirations not fully reducible to rules; its members absorb them 'often without quite knowing' what their content is. [It] . . . binds its members together by influences and engagements which it is difficult for strangers to ascertain.<sup>8</sup>

This subjectively developed paradigm filters what we see and know, which in turn shape our paradigm. However, science's claim of objectivity is validated by its success in predicting natural phenomena. This is shown by the extent to which we are able to manipulate and explain nature.<sup>9</sup> The objectivity and rationality of science are maintained because the work and judgment of the scientist must be defended before the scientific community.

Thus the concept of objectivity is reformulated in terms of *inter-subjective testability* by which we mean an evaluation of a theory carried on by the judgment of scientists as responsible people. A second aspect of the ideal of objectivity is *universality*, a commitment to be led by the evidence in spite of our personal preferences and to subject our results to critique by the community.<sup>10</sup>

But there is a stubbornness in reality that does not let us mold it arbitrarily. Although our perception is shaped by paradigms, we are limited as to how much we can

flex empirical data. Experimental evidence, including accurate prediction, is among the universal values used by paradigms in assessing a theory.<sup>11</sup> In fact, this built-in commitment of a paradigm to an empirical epistemology can bring about the demise of the paradigm itself.

As an illustration of a scientific paradigm, consider Newtonian mechanics:

- **Symbolic generalizations:** mathematical equations such as Newton's second law,  $F = ma$
- **Metaphysical commitments:** matter in deterministic motion, absolute space and time
- **Values:** accuracy of prediction, measurability of results, observable subject matter
- **Exemplars:** scientific problem-solving techniques displayed in Newton's work

Its exemplars have been elaborated by standard examples and problems in textbooks and by lab activities such as free fall motion, swinging pendulums and planetary orbits. Its metaphysical commitments have a characteristic typical of all scientific disciplines today: a *naturalistic* metaphysics. Its values required accurate predictions; this eventually spelled its downfall and replacement by Einstein's theory of relativity.

### Religious Paradigm

In seeking to ascertain the components of a religious paradigm, we note that the church certainly has its *symbols*—the cross and the sacraments, for example.

Experiences common to the Christian tradition include awe, reverence, supernatural encounters, moral obligation, conversion, and reconciliation.<sup>12</sup> In fact, Polkinghorne suggests that "one of the strongest indicators of the validity of the claim that religion is in touch with reality is provided in the universal character of the mystical experience."<sup>13</sup> These experiences have *metaphysical* implications, suggestions of a

## *A paradigm colors the scientific assumptions about the kinds of entities that exist and the appropriate method of inquiry.*

transcendent reality, a supernatural element. Also, some of these experiences implicitly involve an intuitive element, suggesting a characteristic of the epistemology that is to be used.

*Values* that could characterize the theological enterprises are coherence (the doctrines should fit together), economy and adequacy (the *Great Controversy* motif perhaps qualifies), relevance (a connection between theology and religious experience), and fruitfulness ("by their fruits you shall know them").<sup>14</sup> The intersubjective use of these values could provide the basis for rationality in religion. They would limit the range of acceptable models used in interpreting the experience of the religious community.

Finally, Christ would be the normative *exemplar*; Scripture contains the examples. For Seventh-day Adventists, Ellen White would serve as an additional exemplar.

Barbour proposes that experience should provide similar control over a religious paradigm, just as empirical data does for a scientific paradigm.<sup>15</sup> Unfortunately, this personal experience is not subject to verification or falsification in the same way as empirical data. Experience does not offer the predictive skills of science. Rather, Polkinghorne suggests, the theologian (the practitioner in the religious community) directs our attention to

patterns of experience.<sup>16</sup>

### Contrasting Religious and Scientific Paradigms

We conclude that formally it seems to be possible to analyze the religious community and the discipline of theology in terms of the concepts of Kuhn's paradigm. However, some do not feel comfortable with some of the implications of the suggested parallels. One could argue, for example, that revelation, not community values, should provide the criteria for evaluating beliefs, that Scripture, not experience, should serve as the norm for truth, and that historically the community is called and led by God (Abraham, the Exodus, Christ's selection of the disciples) rather than the community choosing and developing a paradigm. In short, it is God that takes the initiative, not the community of believers.

We have already alluded to the fact that religious experiences suggest the transcendent and supernatural. Christians acknowledge the existence of a transcendent God who is able to act in supernatural ways (miracles, for example). This is in distinct contrast to the naturalistic metaphysics normally assumed by the current paradigms of science. As George Knight says:

Christianity is a supernatural religion, and it is thoroughly antithetical to all forms of naturalism, to those . . . schemes of thought which do not place God at the center of the human . . . experience.<sup>17</sup>

It may clarify this contrast to say that in the natural sciences we are concerned with entities that in some sense *we transcend*, whereas in our religious experience we are seeking to relate to that which *transcends us*.<sup>18</sup>

As mentioned above, some of the values shared by religious communities suggest an intuitive epistemology. In addition, the Christian paradigm includes

revelation, which can be formally identified with the epistemological categories of intuition and of witness or testimony. Again from Knight:

For the Christian, the Bible is the foremost source of knowledge, and the most essential epistemological authority. All other sources of knowledge must be tested and verified in the light of Scripture.<sup>19</sup>

So while a religious epistemology may include empiricism based on experience and reason, the categories of witness and intuition are important also. By contrast, while science makes use of witness (journal articles and society meetings) and intuition (the creative insight or sudden inspiration), the epistemological emphasis is on sense-data and reason.

### Conclusion

It has been our purpose to compare and contrast scientific and religious paradigms and their communities. Similarities include the possibility of analyzing both in terms of the formal components of a paradigm, the essentiality of community to both traditions, and the importance of intersubjective testing and universality, along with data and experience, to foster "rational objectivity" in both communities. However, for conservative Christians for whom the Bible is foundational, God takes the initiative in developing the community and experience is evidential, not normative.

Other distinctions between scientific and religious paradigms are due to fundamental differences in metaphysical positions (natural vs. supernatural), focus (the transcended vs. the transcendent), and epistemological emphasis (empirical and rational vs. testimony and intuition). These differences suggest a "vertical" dimension of reality to which religion must relate in addition to the "horizontal" level to which science limits itself.

*In the natural sciences we deal with entities that we transcend, but in our religious experience we seek to relate to that which transcends us.*

Polkinghorne, a professor of theoretical physics and a vicar in the Anglican Church, aptly summarizes our discussion:

Theology differs from science in many respects, because of its very different subject matter, a personal (transcendent) God who cannot be put to the test in the way that the impersonal physical world (which we transcend) can be subjected to experimental enquiry. Yet science and theology have this in common, that each can be, and should be, defended as being investigations of what is, the search for increasing verisimilitude in our understanding of reality.<sup>20</sup>

### NOTES

1. R. N. Giere, *Explaining Science: A Cognitive Approach* (Chicago: The University of Chicago Press, 1988), p. 32.

2. T. S. Kuhn, *The Structure of Scientific Revolutions*, 2nd. ed. (Chicago: The University of Chicago

Press, 1970), p. 187.

3. B. J. Walsh, and J. R. Middleton, *The Transforming Vision: Shaping a Christian World View* (Downers Grove, IL: InterVarsity Press, 1984), p. 169.

4. D. Ratzsch, *Philosophy of Science: The Natural Sciences in Christian Perspective* (Downers Grove, IL: InterVarsity Press, 1986), p. 55.

5. G. Gutting, ed., *Paradigms and Revolutions* (Notre Dame, IN: University of Notre Dame Press, 1980), pp. 1, 3, 8.

6. D. Oldroyd, *The Arch of Knowledge: An Introductory Study of the History of Philosophy and Methodology of Science* (New York: Methuen and Co., 1986), p. 325.

7. Kuhn, p. 176.

8. R. Vernon, "Politics as Metaphor: Cardinal Newman and Professor Kuhn," in Gutting, p. 250.

9. D. A. Hollinger, "T. S. Kuhn's Theory of Science and its Implications for History," in Gutting, p. 206.

10. I. G. Barbour, *Issues in Science and Religion* (New York: Harper and Row Torchbook, 1971), pp. 183, 184.

11. I. G. Barbour, *Myths, Models, and Paradigms* (New York: Harper and Row, 1974), p. 115.

12. *Ibid.*, pp. 149, 150.

13. J. Polkinghorne, *One World: The Interaction of Science and Theology* (Princeton, NJ: Princeton University Press, 1986), p. 29.

14. *Ibid.*, p. 36.

15. Barbour, *Myths, Models and Paradigms*, pp. 147-149.

16. Polkinghorne, pp. 32, 36, 37.

17. G. Knight, *Philosophy and Education: An Introduction in Christian Perspective* (Berrien Springs, MI: Andrews University Press, 1980), p. 156.

18. Polkinghorne, p. 35.

19. Knight, p. 158.

20. Polkinghorne, p. 42.

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