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## Beliefs and the Scientific Enterprise (Book Review)

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# Book Reviews

by Russell Maatman

*Beliefs and the Scientific Enterprise* by Clarence W. Joldersma. Toronto, Ontario: Institute for Christian Studies, 1983, 174 pp. Reviewed by Charles C. Adams, Associate professor of Engineering.

If one were to inquire into the nature of philosophy of science by perusing the appropriate shelves of any respectable university library, some very obvious patterns and trends would immediately be revealed. Names such as Carnap, Reichenbach, Grunbaum, Margenau, Feyerabend, Popper, Negal, Russell and Hempel would become familiar by their continued references. One could not help but be impressed (or rendered distraught) by the heavy use of mathematics, set theory in particular, throughout many of the more technical discussions. And some careful reading would soon make clear the primary role played by empirical evidence, facts, data, and experiment in the thinking of most of the writers. As corollary to the emphasis on empirical evidence, one would find a denigration of knowledge based primarily on faith or belief.

It is to this latter emphasis, the notion that "unproven beliefs, in particular, should not be part of the knowledge production process and should be excluded from any basis of knowledge" (3) that Clarence Joldersma attempts to speak in his book. His contention is that beliefs not only play an important role in the process of science, but that they "form the foundation or basis of research, and do so by acting as a framework for that activity." (14) To demonstrate and reinforce this thesis, Joldersma reviews the thinking of three philosophers of science who have done their work either outside of, or in direct opposition to the prevailing positivistic movement. These three are Thomas Kuhn, Michael Polanyi, and Gerard Radnitzky.

Kuhn is well known for his book, *The Structures of Scientific Revolutions*, where he develops the thesis that science progresses by two distinct modes, one might say "by leaps and by plods." The plodding, which he calls normal science, is dominated by a framework or *paradigm* to which, according to Kuhn, all scientists uncritically adhere. The other mode of progress is that of revolution. A *crisis* occurs wherein the accepted

paradigm is unable to account for a particular class of phenomena and a new framework is sought. When such a framework gains sufficient support within the scientific community, it displaces the old paradigm, and a period of *normal science* returns. Kuhn is critical of the positivistic idea that science progresses in a cumulative way, with knowledge steadily adding to knowledge; and his idea of a paradigmatic framework to which scientists uncritically adhere, is antithetical to the notion that science is belief-free, working only from *the facts*.

Joldersma makes good use of Kuhn's ideas in support of his own thesis. In perhaps the most incisive part of the book, Joldersma deals with Kuhn's belief that "science education in high school and university gives the scientist the paradigm to which he is committed during his career." (37)

Education lays the ontological, epistemological, and methodological foundations and convictions a scientist uses during his research career; when a scientist is still young and impressionable, and not able to judge the correctness of views and methods, he is given what are held up to be the proper tools for doing science. He commits himself to these because he is not presented with any other choices, nor is he invited to explore different avenues. (37)

A major tool of science education is the textbook. (38)

. . . the dogmatic nature of science education is similar to and only rivalled by systematic theology. . . . the dogmatic indoctrination reveals that acceptance of a paradigm is not just simply based on facts or data; rather, the basis for one's commitment to the paradigm can best

be characterized as confidence in the authority of the teacher and text, an education induced confidence. (39)

Michael Polanyi is not so much concerned with explaining the historical process of scientific knowledge as with the character of that knowledge itself. He "maintains that scientific investigation and knowledge are based on a framework of unproven, inarticulate beliefs or premises, confidently held by the researcher." (54) Joldersma finds support for his own thesis in Polanyi's view of facts, data and beliefs.

Apart from meaningless sense impressions there is no experience that abides as a 'fact' without an element of valid interpretation having been imparted to it. . . [T]here are no mere facts in science. A scientific fact is one that has been accepted as such by scientific opinion, both on the grounds of the evidence in favor of it and because it appears sufficiently plausible in view of the current scientific conception of the nature of things. Besides, science is not a mere collection of facts, but a system of facts based on their scientific interpretation. (77)

Here Polanyi proposes a different view of facts and data. Belief about the nature of things filter and group incoming sense impressions into meaningful facts and observations. (77)

Gerard Radnitzky is less well known than either Kuhn or Polanyi, and Joldersma provides us with a good introduction to his thought. Like Kuhn and Polanyi, he rejects the positivist notion that the only valuable knowledge is knowledge of *the facts*. He believes that the activities of science are shaped by a framework of unarticulated presuppositions which he refers to as *internal steering fields*. Unlike Kuhn and Polanyi, Radnitzky is "not primarily interested in either the history of science or the personal aspect of epistemology" (139); rather he wants "to develop a normative theory of research to avoid the false image of science maintained by the logical empiricists, and to liberate the researcher from blind adherence to tradition." (99) Radnitzky's emphasis on a theory of research and his concern for identifying norms for scien-

tific research make him unique among philosophers of science; his latter concern makes him especially interesting to anyone seeking to work out a biblical perspective on science.

Overall, Joldersma's book is a good introduction to the thought of these three thinkers. His references and bibliography indicate that there is careful research behind what he has written. There is at least one considerable flaw, however. Joldersma never really identifies where *he* is coming from and where he is going. We know his thinking is in opposition to the positivist notion that beliefs have nothing to do with science; and in his final chapter he attempts to develop a model of the scientific enterprise using beliefs as a framework for investigation. But true to the title of that final chapter, his model is a *composite* model, combining the thought of Kuhn, Polanyi, and Radnitzky, but appearing to leave Joldersma out of the picture. One can't help ask the question, why? Why is this *composite* model any better than the positivistic model? Each of the chapters on the three thinkers ends with a section entitled "A Brief Assessment of . . ."; but one is forced to ask, On what basis is the assessment made? What is Joldersma's "belief framework" which directs him to evaluate philosophy of science the way he does? Since the book is the result of a Master's thesis at the Institute of Christian Studies, we can assume that his framework is one of biblical philosophy, very likely that of the Philosophy of the Law Idea. But we ought to know that by reading the book. The ideas that are developed by analyzing the thinking of Kuhn, Polanyi, and Radnitzky can be quite valuable in furthering our understanding of how we are to understand and do science obediently, before the face of the Lord. But Joldersma is silent on this point. One cannot resist the ironic conclusion that while carefully developing a case for the importance of a belief framework for scientific work, Joldersma has been just as careful to avoid articulating the presuppositions and conclusions which characterize his own belief framework.

Despite the flaws, I would recommend *Beliefs and the Scientific Enterprise* to anyone seeking a broader perspective on the philosophy of science in general, and as an introduction to the thinking of Kuhn, Polanyi, and Radnitzky in particular. We hope to hear more from Joldersma in the future.

*Exploring Medical Ethics*, by Henlee H. Barnette, Mercer University Press, 1982. 171 pp., hardcover. \$12.95. Reviewed by Aaldert Mennega, Professor of Biology and Director of the Pre-Nursing Program at Dordt College.

The author has been Professor of Christian Ethics at Southern Seminary for 26 years, and now is Clinical Professor in the department of Psychiatry and Behavioral Sciences at the University of Louisville

School of Medicine. This, his eleventh book, deals with theological ethics in medicine, and was written for physicians, medical students, nurses, counselors and clergymen. It seeks to give practical guidance in caring