

Heller, Michael, *Creative Tension: Essays on Religion and Science*, Templeton Foundation Press, Philadelphia, 2003, 171 pages, index, appendix

Michael Heller is the 2008 winner of the Templeton prize in science and religion and these essays demonstrate that the prize was well-deserved. *Creative Tension* was published in 2003; however, because Heller is from Poland and has written largely in Polish, his work was virtually unknown to Western audiences until he received the Templeton prize. Heller is both a Roman Catholic priest and a cosmologist. He is actively engaged in research on non-commutative geometry and its application to relativity and quantum mechanics. Thus he brings both the perspectives of a practicing scientist and a trained theologian to these essays. The result is a unique and stimulating integration.

Although each of the fourteen chapters could be treated as a stand-alone essay, they possess a natural flow from one to another. Part I consists of 4 essays grouped around the theme of methodological issues; Part II (also 4 essays) offers a historical perspective. Part III, titled "The Work of Creation," is the heart of the book; the three essays deal successively with relativity, quantum mechanics, and probability theory, frequently using Heller's own research to illustrate ideas. Part IV (also 3 essays) focuses directly on science and faith issues.

While it is well-known that religious people often employ a "God-of-the-gaps" theology, Heller points out that people on the science side of the dispute often employ it as well, in the form of a "no gaps, no God" argument. The first essay discusses examples of both forms drawn from "big-bang" theory. The second essay tackles the theological interpretation of physical creation theories. Heller analyzes the nature of physical theories and argues that it is not possible for a philosophical or theological interpretation to be in strict agreement with a physical theory – common language and the mathematical language of theory are too different. Thus at best such interpretations are metaphors. He also introduces a key theme – the most important questions for theology that arise from science are not associated with particular theories but rather are: Why is there anything and why is the world comprehensible? The third essay defines the "scientific image of the world" as a global picture of the physical world obligatory for scientists in a given epoch and highly influential on non-scientists. He carefully describes the medieval, enlightenment, and contemporary images and persuasively argues for the importance of theologians understanding the image within which their culture operates. The last essay briefly discusses a possible program for a theology of science. It discusses two aspects of the world inaccessible to both philosophy and science – the contingency of the world and the values present in it – and offers some reflections on the rationality of the world. It then suggests that the principal role of revelatory data in consideration of science is not analysis of specific scientific theories (e.g., biological evolution or big-bang cosmology) but rather consideration of the significance of the scientific endeavor.

Part II addresses the historical context of the religion-science conflict. Chapter 5 discusses the nature of the Copernican revolution. In the popular perspective, the pre-Copernican view placed humanity at the center of the universe and Copernicus displaced it. Heller argues that the medieval image was only vaguely geometric; it was more like a city with God (not humanity) in the center. Thus the Copernican revolution can be seen as moving humanity from "the privileged margin to the average center." He also discusses the processes that gave the Copernican revolution momentum and the "strangeness" the revolution introduced between science and theology – that science aims for intersubjective transferrable information whereas religion, at its root, involves an intimate nexus between an individual and God. Chapter 6 is critical to Heller's thought. He argues that Christianity was not simply a vehicle to carry Greek thought to the modern era. Rather it introduced the notion that the world is contingent upon God's will, could have been made differently, and thus its nature cannot be

discovered by speculation. This opened the door to empirical investigation of nature. Heller also points out that a deep tenet of science is that nothing should be accepted without sufficient proof or argument. But there is no *a priori* justification for this tenet; thus rationality becomes a moral choice – its successes can be viewed as revealing the correctness of that choice. For Christianity, “that Christ is the logos implies that God’s immanence in the world is his rationality.” There is thus a profound affinity between Christian belief and science; nevertheless, the age succeeding Copernicus was characterized by conflict between belief and science rather than symbiosis and Heller analyzes the basis for this. Chapter 7 is a brief analysis of the work of Teilhard de Chardin. In the mid-twentieth century, Chardin’s work demonstrated a possible synthesis of evolution and Christian belief. But subsequent scientific advances have rendered Chardin’s views out of date. Heller discusses three ways in which this has occurred. Chapter 8 examines the work of Georges Lemaitre, like Heller, a scientist and a priest. Lemaitre lived in the early twentieth century when logical positivism was ascendant. He was extremely careful not to mix his science and his religious convictions. But today, even secular scientists speculate freely on religious and philosophical matters. Thus Lemaitre illustrates how much the climate surrounding these issues has changed.

“Although science and theology use different languages and employ different methods, they often speak on the same subject. Therefore confrontations – not necessarily conflicts – are unavoidable.” These words introduce Part III, the most challenging and the most substantive section of *Creative Tension*. Chapter 9 examines the mathematical definition of the initial singularity (aka “the big bang”) and conditions for its existence then suggests some philosophical and theological implications. It identifies several dangers in identifying the initial singularity with God’s creation of the universe. Most importantly, general relativity is a classical model – one that does not involve quantum mechanics. The initial singularity arises from solutions to the equations for general relativity. At quantum levels, this theory breaks down. Heller contrasts this with non-commutative geometric models; these generalize relativity, apply at the quantum level, but yield solutions that are totally non-local. Thus space, time, and individuality do not exist in their usual meanings. One noteworthy implication is for process theology’s view that an atemporal God would be static. In fact, non-commutative models yield solutions that are global states that are dynamic – that is, change can occur apart from space and time. Thus this claim of process theologians is falsified. Chapter 10 extends the discussion of non-commutative geometry and quantum mechanics and explores some fascinating implications for generalized notions of causality without time and probability without individual events. Heller also suggests that these notions will necessitate some rethinking of God as primary cause. Chapter 11 addresses views that at its most fundamental level, reality is random; often such views are presumed atheistic. But such a presumption neglects two principal questions: Why do the laws of probability apply to the world? And, why should the world be “frequency stable” – i.e., why does the law of large numbers hold? Heller concludes this section by arguing that any natural theology is sentenced to a “God-of-the-gaps” strategy; thus we need to distinguish essential and non-essential gaps. He argues that all gaps are spurious except two and perhaps a third: Why is there something rather than nothing? Why is the world comprehensible? How do we account for meaning and values?

Part IV focuses on the limits of science, acknowledging that “limits” may be a poor metaphor as there are no sharply defined boundaries. Chapter 12 is titled “Illicit jumps – the logic of creation” and focuses on the interplay between syntax and semantics in language. The leap from syntax to semantics is often a source of paradox – for example, “This sentence is false.” But it works in three important examples – in the genetic code, syntax generates semantics; in the human neuronal system, signals give rise to consciousness; and showing that mathematical laws could make it possible for something to arise out of nothing (as some have argued) doesn’t account for the origin of the laws. But

he cautions against God-of-the-gaps inferences here. Chapter 13 addresses the concept of rationality. It's tempting for empiricists to identify rationality with the mathematical-empirical method. But there exist other ways of knowing that seem rational. Consider the statement "The mathematical-empirical method is rational." This cannot be verified by the mathematical-empirical method. Heller suggests some thoughts on what such a broadened concept of rationality might look like. Chapter 14 concludes the book with some thoughts on science and transcendence, noting that contemporary science teaches us as never before a sense of mystery; it ends with a collection of thoughtful questions that foster this sense. The book includes an appendix describing the work of the Center for Interdisciplinary Studies in Cracow to which Heller belongs and its work in science and religion.

*Creative Tension* is well-written and stimulating reading. Anyone trained in physical science or mathematics should have sufficient background to understand all of the technical concepts; someone in the social or life sciences may need to skip some technical explanations; a person trained in the humanities can still find much here but will need to read selectively. I highly recommend it for anyone interested in the science-religion conflict.