

John Polkinghorne, ed., *The Trinity and an Entangled World: Relationality in Physical Science and Theology*. Grand Rapids, MI: Eerdmans Publishing Co., 2010. Pp. xi+215, \$30.00.

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As far back as 1988, Pope John-Paul II in a letter to Reverend George Coyne, S.J., then Director of the Vatican Observatory, expressed his desire for a new “relational unity between science and religion,” to overcome the divide that has separated them since the Enlightenment.¹ With the publishing of the book *The Trinity and an Entangled World: Relationality in Physical Science and Theology* (a compilation of thirteen essays

1. Pope John-Paul II, “Message of His Holiness John Paul II,” in Robert J. Russell, Willam R. Stoeger and George V. Coyne, *John Paul II on Science and Religion: Reflections on the New View from Rome* (Notre Dame, IN: University of Notre Dame Press, 1991), M.10.

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by various authors), the “relational unity” of which the pope spoke finds its expression in a study whose focus is “relationships.” Written primarily from a Christian perspective, the various essays in the book grapple with the notion of the Trinity, or more specifically with the relationships constitutive of the Trinity as a paradigm for understanding the world of modern quantum physics and the social sciences. Implicit in much of the book is the notion that entanglement in physics and other physical and social phenomena invert the classical Aristotelian distinction between substance and relationship by emphasizing the primacy of relationality in the natural world.

In the first essay, entitled the “Demise of Democritus,” Polkinghorne notes that “discoveries have been made and insights gained in physical science that have clearly indicated the need not to rely simply on atomistic accounts and reductive techniques of analysis, but to employ also a complementary approach by holism and intrinsic relationality” (2) to produce a “Theory of Everything” that unifies the different forces (or rather fields) of physics. By extension, Polkinghorne also notes that “for the Christian the true ‘Theory of Everything’ is Trinitarian theology” and that “the universe is deeply relational in its character and unified in its structure, because it is the creation of the one true God, Father, Son, and Holy Spirit” (12).

After Polkinghorne’s introduction, in which he sets the tone for the rest of the book, there follow three essays related to relationality in physics, three related to relational ontology with the last one in this triplet serving as an introduction to the next three essays that focus on relational ontology and the Trinity. These are then followed by two essays that focus on psychological and sociological aspects of human and divine relationships, respectively.

The last essay, by Sarah Coakley, revisits the overarching themes of the book.

In terms of physics, in “The Entangled World: How Can It Be Like That?,” Jeffrey Bub investigates the underlying intelligibility associated with the phenomenon of quantum entanglement. Entanglement is a physical property related to correlations between (pairs) of particles in which, for example, a measurement of spin value made on one particle permits one to deduce the spin value of the second particle and vice-versa. However, such correlations are short lived and are destroyed by the act of observation. Specifically, Bub analyzes the different meanings from the perspective of classical and quantum physics and concludes that because of the nature of particle correlations (entanglement), there can be “no cloning” of individual particle properties. In other words, relationality precludes cloning of individual particles.

In “Quantum Physics: Ontology or Epistemology?,” Anton Zeilinger notes that “making the assumption that a single object existing in an otherwise empty universe has a position is devoid of meaning” (33). All physical measurements are defined relative to something else and in particular, because of the key role of the observer in the measuring process. “[Q]uantum physics . . . is both a science of information and also a science of what can exist, because of the impossibility of separating epistemology and ontology” (40).

The final essay on physics, by Michael Heller, considers the different meanings underlying “A Self-Contained Universe.” He notes that from the perspective of a generalized Mach’s Principle, the physical universe should be describable in terms of a self-contained mathematical structure that “reflects a tendency inherent in the scientific method to produce a self-contained world model” (53). Ontologically, such a world view could be identified

with Spinoza’s pantheism. But Heller further notes that other “ontological connotations of the ‘self-contained principle’ seem also to be also consonant with the doctrine of panentheism” (53).

Turning to ontology, in “An Introduction to Relational Ontology,” Wesley Wildman hypothesizes that all relations are causal and proceeds to list and expand upon five such causal relationships: participation metaphysics (Plato and Neoplatonism), dependent-arising metaphysics (Mahāyāna Buddhist philosophy), process metaphysics (Whitehead), semiosis metaphysics (Peirce), and implicit-order metaphysics (David Bohm). He also suggests that Trinitarian theology has primarily relied upon participation metaphysics.

In his “Scientific Knowledge as a Bridge to the Mind of God,” Panos Ligomenides explores causal relationships from the perspective of reductionism, a mechanistic worldview and the holistic worldview suggested by quantum entanglement, and then tries to draw out some conclusions regarding a “Divine Organizing Principle.” He concludes that “the reconciliation of rational science and religious spirituality, two powerful institutions of human society, is perhaps our best hope for awakening a new sense of the meaning in our life” (91).

In “Relational Nature,” Argyris Nicolaidis “explores the subject of nature” where “the emphasis is not on the ‘subject’ (avoiding the ‘monism of the subject’), but rather on the *relation* that brings the different entities together into community and communion” (94). He particularly draws upon the work of Charles Sanders Peirce, whom he sees as a protagonist in the development of Trinitarian ontology as a basis for understanding the natural world by means of “*a triadic relation*” (103). He concludes by affirming: “SOCIATUS SUM, ERGO SUM (*I relate, therefore I am*)” (106).

“The Holy Trinity: Model for Personhood-in-Relation,” by Metropolitan Kallistos Ware, essentially elaborates upon the words in the title. It is an exploration of Trinitarian theology primarily from the perspective of the Cappadocian fathers and Richard of Victor, although he acknowledges by way of contrast the contributions of Augustine and Aquinas. He concludes by noting that “it is therefore our vocation as human persons to reproduce on earth the eternal *pericoreisis* that joins in unity the three persons of the Trinity” so that we become “living icons of the Trinity; and the term ‘icon’ is to be understood here in its precise signification, as denoting not identity but participation” (125).

In “(Mis)Adventures in Trinitarian Theology,” Lewis Ayres broadly speaking questions the whole approach to Trinitarian theology being rooted primarily in metaphysics (analogy of being). He suggests that our analogies should themselves be undergoing a process of change, grounded more in “the mystery of God in faith,” and anagogical reflection that comes from “our move towards the Creator” as we “participate,” both individually and as church, in the Divine mystery as it unfolds within history. This article reminds one of the dialogue that took place between Hans Urs von Balthasar and Karl Barth during their lifetimes regarding “the analogy of being” versus an “analogy of faith.”²

The final article on ontology and relationality is entitled “From Relational Ontology: Insights from Patristic Thought.” The author, Metropolitan John Zizioulas, points out that the shift from a substance-based Aristotelian ontology to a relational-based ontology “consists in conceiving all that is said to exist as a constant

movement of change and modification that preserves (or rather brings about) unity and otherness at the same time” (151). Applied to the world of physics it “suggests some form of personhood in relation to creation,” where personhood is used in reference to the Trinity “as *particularities emerging from relations*,” as understood by the Cappadocian fathers (163).

As we approach the end of the book, we are presented with two essays that reflect on the psychological and sociological aspects of the word “relation.” In his essay from the view of psychology, “Relation: Human and Divine,” Michael Walker addresses the three-part question: “What is the minimum structure required to call a constellation between or in so-called ‘subjects’ or ‘subjects and objects?’” (158). In the second part, he reflects on the dynamics of reciprocal, interactive personal relations. In the third and final section, he offers preliminary reflections on divine-human relations. Walker concludes by pointing out that the “relation of love” defines “the ideal connection between creatures.”

In “A Relational Ontology Reviewed in Sociological Perspective,” David Martin begins by noting that the role of sociology (as conceived by Comte) is to replace what was previously the role of theology in shaping society. In this context, Martin undertakes a bottom-up approach to Trinitarian relations rather than a top-down one to ground an “*Imago Dei* in Human Society.” In so doing, he has tried to avoid a reductionist approach by seeing “the transcendent in the immanent rather than reducing the transcendent to the immanent” (175) by means of the principle of partial translatability.

In the concluding essay, “Relational Ontology, Trinity, and Science,” Sarah Coakley examines two points. First, she focuses on “the difference of perspective evidenced in this volume over the

2. Edward Oakes, *Pattern of Redemption: The Theology of Hans Urs von Balthasar* (New York: Continuum, 1994).

central theological question of Trinitarian ‘relationality’” (184). Second, she reexamines the concepts of “relation” and “causation” that underlie the philosophical “efforts in this book to make fruitful connections between physics and theology” (185). With regard to this latter point, she notes that the book has limited itself to contributors who primarily have a Platonic vision of the universe.

Overall, this is a significant contribution to the dialogue between science and religion. In particular, it is a strong statement about the centrality of relationality in both fields. I highly recommend it to theologians and philosophers alike who are intrigued by the entangled world of quantum physics and Trinitarian theology, especially a Trinitarian theology that serves as a paradigm for penetrating the world of quantum physics by means of analogy. Its various essays bring to the fore not only the exciting discoveries of entanglement theory and current Trinitarian theology, but also complement each other in that “each can draw the other into a wider world, a world in which both can flourish.”³

If there is a defect in the book, it is that it is too short and has limited itself to theologians who primarily have a Platonic vision of the universe, as Sarah Coakley has noted. The book would have benefited from articles with a more Aristotelian approach. An essay on Lonergan’s theory of emergent probability might serve as a starting point in that it supplies the methodological tools for distinguishing and unifying the different domains of created reality such as physics, chemistry, biology, and psychology sublated into a theology of grace. I think when dealing with Trinitarian theology, it is good to keep in mind that no one has a monopoly on our understanding, and there is room for both a top-down (Plato) and

a bottom-up (Aristotle) approach, as long as the delicate balance associated with the analogy of being is kept in place. Indeed, once this delicate balance is maintained, we can re-echo Polkinghorne’s words that “for the Christian, the true ‘Theory of Everything’ is Trinitarian theology.”

3. John Paul II, M.13.