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## Mathematics Through the Eyes of Faith (Book Review)

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# Book Reviews

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Bradley, James, & Russell Howell. *Mathematics through the Eyes of Faith*. New York: HarperOne, 2011. viii + 280 pages. ISBN: 978-0-06-202447-3. Reviewed by Calvin Jongsma, Professor of Mathematics at Dordt College.

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*Mathematics through the Eyes of Faith* is the eighth book in a popular series cosponsored by the Council of Christian Colleges and Universities. Dating back to the 1980s, these books typically function as supplemental reading for undergraduate students in a particular major, providing explicit Christian perspective on a discipline or on topics missing from or differently treated by secular textbooks in the field. Until this book, mathematics was not represented in the series, even though the Association of Christians in the Mathematical Sciences (ACMS) has been around and active since the early '70s.

In 2001 ACMS and the Calvin Center for Christian Scholarship did cosponsor the writing of *Mathematics in a Postmodern Age: A Christian Perspective*, which was intended to show both that “there are a number of ways in which a Christian perspective can enrich our understanding of mathematics” and that “many ideas in mathematics can enhance our understanding of the Christian faith” (1). Given the similarity of themes and the fact that the editors of both books are the same duo, one would naturally expect some acknowledgement of the former book in the latter, along with an explanation of why *Mathematics through the Eyes of Faith* (which is not a revision of *Mathematics in a Postmodern Age*) was thought necessary. Being a co-author of the older book, I was disappointed to discover that it doesn't even rate a mention in the new one, except obliquely in the bibliography. I suspect the former may have been deemed too difficult or academic for many college students, warranting a second work on a more popular level. The first book was also addressed in part to the wider mathematical community, while this one is aimed primarily at Christians.

The exact audience, though, for this new book is somewhat ambiguous. It may be pitched to a beginning math major (certain chapters appear to assume a readership unfamiliar with introductory calculus) or even a more general liberal arts student, but it certainly begs for a reader who wants to learn more *about* mathematics. Much of the book is suitable for students wondering whether to major in mathematics and wanting to know

how/if they might pursue this as a Christian; a few parts would best be read by majors already steeped in the field seeking to deepen their understanding of faith's connections to mathematics.

The book contains three main components. The overall purpose of the book—to explore the relationship between mathematics and Christian/religious belief—is treated in a more general way in the first two and the final three chapters. These give a historical and philosophical overview, setting the stage for the book and delving into some deeper issues. Secondly, the book discusses a few special topics (infinity, dimensionality, chance) that are often drawn into a discussion connecting mathematics and religion, and, thirdly, it expounds on certain features of the discipline (truth and proof, applicability, and aesthetics) that many consider central or important to the field.

This book was produced by a team of ten authors, two of whom also functioned as its coeditors. The authors' experience as college-level mathematics instructors is apparent in the clarity of the exposition; the chapters are well written and should pull students into the topics. Different readers will have their favorite chapters, of course. Given my interests, I particularly enjoyed the third chapter on infinity, the tenth on ontology, and the concluding one, which presented a rationale for Christians to pursue the study of mathematics. Different readers will also skim over certain parts as not relevant to their interests or as being only marginally related to the topic. This past year, faculty in the Dordt College Mathematics, Statistics, and Computer Science Department read the book together and at times felt that, while the exposition of a topic was interesting, it didn't contribute much to the overall aim of the book.

Given my own background in and predilection for ferreting out historical and philosophical connections, those were the parts of the book I read most closely. Even while recognizing that a popular text cannot discuss such things with the nuances I'd like to see, I found the

treatment of certain topics wanting, particularly if I were to use the book in a capstone course for mathematics majors. Some connections the authors make between mathematicians (e.g., Pythagoras as a student of Thales, Euclid as the source of axiomatic mathematics, Fibonacci as a student of Arabic mathematicians) are too tidy, given the historical evidence; some significant contributions (the role of Aristotle in delineating the axiomatic method, for instance) are ignored; and important distinctions (e.g., the character of Euclidean-style axiomatics vs. modern formal methodology) are insufficiently contrasted. Furthermore, the claim that mathematics is a cumulative field of thought that builds new theories upon previous firm foundations (134) and so lacks revolutions or far-reaching reformulations is too naive; something as central and well-known as the history of calculus offers a clear counter-example. Mathematicians in the mid-nineteenth century arithmetized analysis and rejected the free-wheeling infinitesimal approach of earlier eras; infinitesimals were reintroduced after a fashion in the late twentieth century but then only in the context of developments in mathematical logic and model theory (non-standard analysis). So, yes, mathematics is largely cumulative, but, as history unfolds, some ideas get discarded and ideas that remain often get reinterpreted in a completely new meaning context.

Certain foundational matters in the text could also be improved upon. The chapter “Proof and Truth” discusses the importance of producing proofs for mathematics, and the book exhibits a few well-known proofs, but nowhere is there an explanation of how these are constructed using logical rules of inference, since none of these are identified. The book’s stance on truth is also a bit fuzzy. At times it argues against a relativistic notion of truth, but in its discussion of the nature of mathematical theories, the notion of truth seems to require hyphenation—results are taken as true-in-this-theory not as true *simpliciter*. Greater clarity may have been reached by distinguishing between axiomatizing specific structures, such as that of arithmetic or geometry, and modern formal axiomatization of general theories, such as that of vector spaces or abstract groups.

As said earlier, the overall purpose of the book is to look at the relationship of religious faith and mathematics. At times in the past, Christian mathematicians have taken an eclectic and somewhat simplistic approach to that relationship. Here analogy often supplied the proper mode of connection. For example, mathematics takes

certain matters on faith (axioms) and is considered a rational field of thought; therefore, Christianity, which also holds basic beliefs without requiring rigorous proof, shouldn’t be dismissed as irrational. The three subsets of the natural numbers with distinct common remainders when divided by 3 have the same size as one another and as the full infinite set of natural numbers; thus the notion of the Trinity as three co-equal and co-eternal persons co-existing in one being may be paradoxical but shouldn’t be judged illogical.

This approach is not taken by *Mathematics through the Eyes of Faith*. The authors here present two main different approaches to connecting Christianity with mathematics (though Aquinas occasionally gets a nod for certain purposes as well). The predominant approach of the book, which it identifies as having the hoary heft of history on its side, is that of Christian Platonism. Tracing its lineage through Newton and Kepler back to Augustine and Plato and Pythagoras, this viewpoint grounds a Christian view of mathematics in the Being of God. Mathematical ideas and truths along with the laws of logic are seen either as ideas in the Mind of God or as being a part of God’s Nature. God made use of these rational parts of Himself to create the cosmos with a mathematical architecture. Scientists and mathematicians like Galileo and Newton and Leibniz divine the Mind of God as they uncover the deep (mathematical) structure of Nature; thus, it is not surprising to a contemporary Christian Platonist to learn about the multitude of effective mathematical connections discovered in the scientific realm.

The book’s second main approach is called Christian Mathematical Empiricism (not a name I would choose, but let’s stick with it). This is traced back to Aristotle, who refused to accept his teacher Plato’s postulated world of ideal mathematical entities. Aristotle instead saw mathematical notions and claims as arising from a process of abstracting and inter-relating quantitative features found in everyday experience. The main contemporary Christian proponents of such a view are thinkers associated with the Reformational neo-Calvinism of Dooyeweerd and Vollenhoven. This viewpoint rejects Christian Platonism’s placement of mathematics and logic within divinity and sees them instead as related to human experience of creation. This approach takes God as transcending mathematics and logic rather than as containing them or as being subject to them; mathematics formulates laws God made to govern quantitative

features of creaturely existence. Furthermore, while Christian Platonism views mathematical theories as discoveries of truths about some super-sensory realm, Christian Mathematical Empiricism sees an important supportive role for invention as well since humans are the ones abstracting and theorizing about the mathematical structure they find within creation.

It's good to see a somewhat balanced presentation of different Christian perspectives on mathematics, but more could have been done with the second approach. Christian Mathematical Empiricism could have been highlighted sooner in the book instead of being relegated to six pages in the tenth chapter "Ontology." A neo-Kuyperian Christian perspective has things to say about history and foundations and epistemology and

applicability, too, but those writing the earlier chapters on these things made no attempt to explain what difference the second approach might make there.

With the publication of *Mathematics through the Eyes of Faith*, college mathematics educators have some new supplementary material for incorporating reflections on mathematics and Christianity into their courses. Not all parts of the book will work well in a single course for mathematics; some chapters are a better fit for an introductory course and others for a capstone seminar. Since very few books or articles give an academic treatment of the relationship between mathematics and Christian faith on any level, another resource in this vein, such as this one, is welcome.

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Smith, David. A., and James K. A. Smith, eds. *Teaching and Christian Practices: Reshaping Faith and Learning*. Grand Rapids, MI: Eerdmans, 2011. 223 pages. ISBN: 978-0-8028-6685-1. Reviewed by Patricia C. Kornelis, Professor of Education at Dordt College.

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In *Teaching and Christian Practices*, editors David Smith and James Smith, along with several Christian university professors, wrestle with how faith is integrated into the acts of teaching and learning. The editors note that Christian scholarship has essentially ignored how teaching pedagogy itself is shaped by faith. Most scholarship regarding Christian teaching focuses on Christian content (ideas and perspectives that reflect a Christian worldview) or Christian modeling (the personal character and spiritual self of the instructor). While not wishing to disregard these aspects of Christian teaching, the editors argue that there is more to the idea of Christian pedagogy. In *Teaching and Christian Practices*, the reader is invited to explore "what Christian practices can contribute to how teaching and learning are carried out and experienced" (11). Through the experiences and experiments of ten college professors in redesigning their courses, the reader witnesses how historic Christian practices such as hospitality, fellowship, testimony, sharing a meal, time-keeping, and adhering to a liturgical calendar are infused into various college courses with the intent of re-imagining the teaching and learning process in relation to God's purposes. This book offers concrete examples of what Christian teaching looks like in practice.

A key underlying theme of this book is one that is expressed in James Smith's earlier work *Desiring the Kingdom*: the idea that "Christian education is not just about the transfer of information but also about the

task of formation" (140). Smith argues that Christian education should focus not only on content and perspective but also on practices that shape us—practices that allow us to fully desire the kingdom of Jesus Christ. In chapter 8, Smith recounts how his own pedagogical practices contradicted his theoretical presumptions about the role of formation. By presenting his own pedagogical dilemma and his subsequent reshaping of his course, Smith allows the reader to discover alongside him how incorporating practices of fixed-hour prayer and attending to the liturgical calendar changed and deepened students' learning as they connected these practices to themes of the course.

In another example, Walton and Walter, in their chapter "Eat this Class," describe how the practice of a shared meal with nursing students in a nutrition course supported a goal of Christian formation in that it allowed students to actively participate in the connection of food and faith while learning and practicing sound nutrition. Further, the practice of the shared meal and the community that this practice fostered allowed students to move beyond individual competitive learning practices to ones that respected the accountability of communal experiences.

In other chapters of the book, college professors note how incorporating historic Christian practices also impacts professors themselves. Carolyne Call, in her adolescent psychology course, notes how the practice