

Book Reviews

context of solving linear system problems parallels Lockhart's explanation using sheep and antisheep. Likewise, Arabic and European calculations with subtracted quantities provide a heuristic motivation for multiplying signed numbers. Lockhart's explanations are consistent, however, with his overall perspective on mathematics as a human creation, imaginatively invented. What's most important for him, it seems, is for teachers to reconstruct standard mathematical ideas in ways that charm and entice students to explore them recreationally, even if they involve imaginary hamsters and antisheep rather than practical concerns grounded in historical realities.

Though I very much enjoyed Lockhart's books, I have some reservations and criticisms that go beyond the historical observations just made. These pertain to his basic educational philosophy of mathematics. Lockhart holds that mathematics is ultimately a human mental creation, an art done purely for intellectual enjoyment. He repeats this refrain in a number of contexts, to the point that it gets rather old. Geometry, he insists in *Measurement*, deals with the ideal shapes we define and explore: "none of the things we've been talking about are real ... We made up imaginary points, lines, and other shapes so that things could be simple and beautiful—we did it for art's sake" (p. 169). While this seems harder to assert of quantities, which we experience more precisely, he says in *Arithmetic* that he also conceives of numbers as abstract creatures to which we assign behaviors according to our own aesthetic sensibilities (think: negative numbers). Computation has practical applications, but he still claims that "the idea with arithmetic is to have some fun, keep track of a few things, and occasionally enjoy a bit of cleverness" (p. 24). Mathematicians prefer the "purely mathematical realm" for its "sheer intellectual pleasure and entertainment," a universe of exact abstract entities created with "simplicity and abstract beauty" in mind. This may approximate the "fuzzy, random, and inexact" world we live in, but that's not why mathematicians do mathematics (p. 163). Reality provides us with "crude" and "clumsy prosaic object[s]" about which we could never assert any mathematical truths (p. 181). It provides a springboard for humans to create an imaginary world of perfectly behaved objects: "the whole enterprise is a made-up game in our heads" (p. 193).

While I agree that mathematics is not a utilitarian enterprise, this admission does not lead me to ignore its essential connections to a broader reality. A cursory familiarity with the history of mathematics gives the lie to artistic intellectual elitism. Teachers do need to find ways to motivate students to study

mathematics, but a practical situation can often do this as well as a game or a whimsical exploration of an idea. Dealing concretely with arithmetic and geometry is important on lower levels, and connecting them with nonmathematical contexts expands students' understanding of the value and interest of mathematical ideas and procedures. Mathematics deals with quantitative, spatial, and kinematic patterns in a given creation already structured by God. Its applicability lies not in humans' brains being part of reality, but in the world being structured as a coherent whole by its Creator. Humans have found ingenious ways to interact mathematically with their everyday contexts, but acknowledging this is quite different from crediting us with creating mathematical reality out of conceptual whole cloth.

Lockhart's antipathy toward real-life applications makes him downplay a side of mathematics that can be helpful to teachers and students. Although I find some of his critique of mathematics education valid, it does not fairly take into account the creative ways some teachers and texts try to connect with students. Lockhart is not alone in wanting to incite a love for mathematics. Regardless, his impassioned advocacy in these books for making mathematics come to life through active explorations of important ideas may inspire such teachers to further improve their own teaching.

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THE INTELLIGENT DESIGN DEBATE AND THE TEMPTATION OF SCIENTISM by Erkki Vesa Rope Kojonen. New York: Routledge, Taylor & Francis, 2016. 226 pages. Hardcover; \$150.00. ISBN: 9781472472502. eBook; \$50.00. ISBN: 9781315556673.

Writing from a theologian's perspective, Erkki Vesa Rope Kojonen argues that "beliefs about the purposiveness or non-purposiveness of nature should not be based merely on science. Rather, the philosophical and theological nature of such questions should be openly acknowledged." He cogently spells out the landscape of the debate over intelligent design, exploring historical approaches to the fundamental question of teleology in nature and showing the importance of the theological and philosophical aspects of design.

Rope Kojonen is a postdoctoral researcher in the Faculty of Theology at the University of Helsinki. His studies and research interests focus on the general discussion between faith and reason with specific

emphasis on intelligent design. He is the editor of the Finnish science and theology magazine *Areiopagi*.

Rope Kojonen repeatedly emphasizes that he does not wish to take sides in the intelligent design debate. He only wishes dispassionately to analyze the debate and make a suggestion. "I argue that the sidelining of theology and philosophy from the debate is actually an example of the influence of scientism, defined as the belief that science is the only way to gain reliable knowledge about the world" (p. 3). That, in a nutshell, is the summary of the entire book.

Rope Kojonen begins by offering his view of the origin and definition of the contemporary ID movement. Based on a quote from the Center for Science and Culture department of the Discovery Institute, he states that

ID is three things:

1. A scientific research programme attempting to find evidence of design in nature
2. A community (or movement) of scholars who participate in this research programme
3. A theory which holds that there is indeed evidence for intelligent design in nature. (p. 12)

He points to Phillip Johnson's publication of *Darwin on Trial* as the origin of the ID movement, though not of teleological arguments which have a long history. Thereby he seems to ignore the books and articles in *PSCF* published in the 80s. I view the book *The Mystery of Life's Origin: Reassessing Current Theories* by Charles B. Thaxton, Walter L. Bradley, and Roger L. Olsen as a more seminal trigger of the modern design movement with Johnson's work serving as the expansion into public awareness.

Rope Kojonen makes it clear from the outset that he intends to be fair to all sides. He acknowledges the widespread belief in an intelligent creator even by critics of ID when he says, "The basic idea that nature provides some kind of evidence of an intelligent creator has ancient roots and is even shared by many theistic critics of ID." Then he deftly pinpoints the source of the criticism by saying, "ID's defense of the idea is controversial because of its emphasis on the scientific nature of the design argument, and also because of its critique of evolutionary biology" (p. 30). He proceeds to map out an exhaustive articulation of the arguments set forth by advocates and critics of ID while avoiding his own judgment or preference.

Throughout this discussion, Rope Kojonen meticulously seeks to be even handed, supplying a balanced view. Taken to the extreme, he edges perilously close to creating a false equivalence between arguments

for and against ID. In reality, virtually the entire scientific community that has assessed the claims of ID has found them wanting while the advocates are a small minority. That overwhelming perspective cannot be gleaned from this book. Nevertheless, the book is valuable for providing a dispassionate description of the arguments for and against ID.

Rope Kojonen's main concern is the emphasis the ID advocates place on scientific evidence for ID. He feels that by downplaying the theological and philosophical aspects ID proponents succumb to the temptation of scientism, despite their expressed opposition to scientism. He feels that ID advocacy would be better served by an open discussion of the pertinent theological and philosophical issues. On the other hand, in my opinion, those perspectives generally do not fare any better than the scientific arguments. Combining several weak arguments does not provide a strong argument. Nevertheless, it is a useful recommendation to the ID community that theologians and philosophers are brought into the discussion more closely, providing a clear linkage to those fields.

The book covers virtually the entire spectrum of topics in the ID controversy, though with disappointingly minimal discussion of the information argument. Better copy editing to correct the numerous missing and extra words would have been helpful but the message comes through clearly. It is a worthwhile source for anyone wishing to delve deeper into the nuances of the ID debate.

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STANDING ON THE SHOULDERS OF GIANTS: Genesis and Human Origins by Luke J. Janssen. Eugene, OR: Wipf and Stock, 2016. 334 pages. Paperback; \$32.00. ISBN: 9781498291408.

Luke Janssen is a professor in the Division of Respiriology, Department of Medicine at McMaster University in Hamilton, Ontario. He has a distinguished career as a cell biologist with over 130 peer-reviewed articles. He is also a former young-earth creationist who has wrestled hard with the reality of his faith in light of what he now sees as scientific reality. This clearly written book (his second on the topic) is the result of his thorough examination of both the scientific and theological issues at stake in the human origins discussion.

Given the breadth of the subject matter that extends beyond the author's expertise in the medical sciences, the book would have benefitted from more input from colleagues with expertise in theology and