

who fail to consider religious presuppositions are likely to build intransigence among their religious students. On the other hand, culturally competent teaching methods have been shown to successfully engage both evolutionary theory and the learner's presuppositions and religious beliefs. A growing body of empirical studies shows that culturally competent evolution educators can gain the trust of their students, who are then less resistant to new or previously rejected propositions about evolution.⁵

In summary, this fine book suffers from a failure to recognize naturalism/materialism as the core conflict between creationists and materialistic evolutionists,⁶ and it doesn't promote the building of trust and reconciliation in educational settings through culturally competent evolution instructional methods.

Notes

¹David Papineau, "Naturalism," in E. N. Zalta, ed., *The Stanford Encyclopedia of Philosophy* (Summer 2021 Edition), <https://plato.stanford.edu/archives/sum2021/entries/naturalism/>.

²William Jaworski, "Why Materialism Is False, and Why It Has Nothing To Do with the Mind," *Philosophy* 91, no. 2 (2016): 183–213, <https://doi.org/10.1017/S0031819116000036>.

³David Ray Griffin, *Religion and Scientific Naturalism: Overcoming the Conflicts* (Albany, NY: SUNY Press, 2000), 11.

⁴Sy Garte, "Teleology and the Origin of Evolution," *Perspectives on Science and Christian Faith* 69, no. 1 (2017): 42–50, <https://www.asa3.org/ASA/PSCF/2017/PSCF3-17Garte.pdf>.

⁵For example, M. Elizabeth Barnes and Sara E. Brownell, "A Call to Use Cultural Competence When Teaching Evolution to Religious College Students: Introducing Religious Cultural Competence in Evolution Education (ReCCEE)," *CBE – Life Sciences Education* 16, no. 4 (2017), <https://doi.org/10.1187/cbe.17-04-0062>.

⁶See M. Elizabeth Barnes et al., "'Accepting Evolution Means You Can't Believe in God': Atheistic Perceptions of Evolution among College Biology Students," *CBE – Life Sciences Education* 19, no. 2 (2020), <https://doi.org/10.1187/cbe.19-05-0106>.

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DAWN: A Proton's Tale of All That Came to Be by Cees Dekker, Corien Oranje, and Gijsbert van den Brink. Translated by Harry Cook. Downers Grove, IL: InterVarsity Press, 2022. 166 pages, discussion questions. Paperback; \$22.00. ISBN: 9781514005668.

Imagine that you could witness the entire history of the universe first-hand, from the big bang to the end of time. Perhaps, if you were a sentient yet patient proton, you would have the necessary longevity and attention span, and this idea could become your reality. Such is the premise of *Dawn: A Proton's Tale of All That Came*

to Be. "Pro," as the proton protagonist is known to his chatty neighboring subatomic particles, is born from quarks in the first second after the big bang, blind and knowing nothing, but with an insatiable curiosity about what is happening, and why. Conversations with other particles born a split-second earlier soon produce in Proton a deep admiration for a skilled Creator, and a sense of wonder and anticipation about what they have seen and what will happen next.

Throughout several chapters, Pro confusedly and vividly experiences the onset of light, nuclear fusion, a supernova, and incorporation into a molecule as part of a carbon nucleus. Pro ends up in the dust cloud that forms Earth, eventually witnessing the origin of terrestrial life as part of an RNA molecule. A rumor among the subatomic particles that the Creator wants to make personal contact with one of the creatures generates a guessing game as they witness the progress of evolution. Which lifeform will it be?

When *Homo sapiens* arrive on the scene, the story shifts to tracking biblical narratives, and the subatomic particles begin asking each other more theological questions. The Creator makes contact with two humans, a chieftain couple in Africa. The Fall ensues when the couple and their tribe reject the Creator's instructions, much to the subatomic particles' surprise and horror. Pro and his neighbors are then able to witness key moments in the progress of redemption, becoming fly-on-the-wall observers to events in the lives of several important biblical characters. "How is the Creator going to fix things?" the particles ask each other.

At this point it becomes apparent what a colossal challenge the three authors (a nano scientist, a novelist, and a theologian)¹ have taken upon themselves. They have tried to produce a gripping narrative in which the protagonist does not know the outcome, but Christian readers will. They have set out to tell an entertaining story of the history of the universe from a Christ-centered perspective, filled with imaginative details that are consistent with modern science but also with the biblical witness. They have charged into a literary no man's land between fiction and nonfiction.

Do they succeed? In many ways, admirably so. The merging of science and biblical witness is skillfully accomplished, respecting the integrity of each source of knowledge. To readers of this journal, the idea of a Creator patiently guiding the evolution of the universe and of life over billions of years in order to generate Earth and its humanity, followed by the increasingly intimate involvement of that Creator in redeeming humanity, is familiar. To many others, this idea will be revelatory.

Book Reviews

If evaluated as a work of fiction, it would be safe to say that *Dawn* is wildly imaginative, yet it is also strangely hindered by the passivity of the narrating subatomic particles. “Imagine that you yourself could determine where you would like to go” (p. 28), they muse just before the first protocell develops. Pro witnesses and experiences history but cannot intervene. The subatomic particles can react, but they have no agency in the macroscopic world. They do not embark on a quest or a voyage of self-discovery. “Just go with the flow” (p. 29), one advises. The tropes of fiction, however, are probably the wrong standards for evaluating this book.

Dawn succeeds, in the end, as creative nonfiction—the memoir of a proton. Along the way, it retells the old, old story in an imaginative way. The authors have created one of the most accessible books on science and Christianity to come out in recent years. Even young adults will be able to enjoy it.

Note

¹Cees Dekker, distinguished nano-scientist at Delft University of Technology; Corien Oranje, novelist/theologian and author of Christian children’s literature; and Gijsbert van den Brink, theologian and holder of the Chair of Theology and Science, Vrije Universiteit Amsterdam.

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FRACTALS: The Secret Code of Creation by Jason Lisle. Green Forest, AR: Master Books, 2021. 224 pages. Paperback; \$29.99. ISBN: 9781683442400.

Fractals: The Secret Code of Creation, by Jason Lisle, is a beautifully crafted coffee-table book which invites readers not only to the beauty of mathematics, but also to belief in Christianity. The author is affiliated with Answers in Genesis and is a founder of the Bible Science Institute, both of which insist on a young earth interpretation of Genesis 1–3.

The mathematical chapters are well written, but the book is really an apologetic for a narrow Christian worldview. The book claims that mathematics, particularly the Mandelbrot fractal and similar objects, displays God’s nature. The first chapter, “The Secret Code,” claims that “those who reject God like to explain the complexity of biological life by appealing to Darwinian evolution,” but that mathematics is free from this “because numbers do not evolve.” The fractals in this book, beginning with the Mandelbrot set, give an “infinitesimal glimpse into the mind of God” (p. 9). This sets the theme: there are only two worldviews, and these are in direct competition. The mathematics of fractals is to lead the reader toward the Christian worldview, indeed to a “secret code.”

A computer-generated example of a fractal, introduced by Benoit Mandelbrot,¹ is created in the complex plane by iterating the quadratic function $f(x)=x^2+c$. Pick a complex number c and examine the sequence $c, f(c), f(f(c))$, and so on. Ask the question, “Do these iterates of the function form a bounded sequence?” If the sequence is bounded, then the complex number c is in the Mandelbrot set. In the complex plane, color that point, c , black. If the sequence $c, f(c), f(f(c)), \dots$ is *not* bounded, give c a color based on the speed of growth of the sequence. Use a modern computer to color the points in the complex plane. With this coloring, the mathematical analysis of the Mandelbrot set gives rise to intricate paintings of the complex plane.

After this introduction, the book describes the required mathematical material: sets, complex numbers, function iteration. The mathematical descriptions are well done and intended for a popular audience. There are no frightening equations to drive away the reader. The prose, along with the accompanying artwork, is inviting. One might use much of this book as an invitation into the study of mathematics. Indeed, many mathematicians have used the study of fractals to do just that.

Chapters two through seven explore the mathematics of the Mandelbrot set with text-printed elegant pictures of various regions of the fractals. Chapters two through five, with picturesque titles—“Valley of the Seahorses,” “Valley of the Double Spirals,” “Infinite Elephants, Scepters on Seahorses”—focus on a particular region of the Mandelbrot set, zooming in to display intricate spirals, bays, peninsulas. The infinite complexity of these drawings is beautiful and agrees with my belief that mathematics is the language of the great artist.

The sixth chapter, “Changing the Formula,” asks what happens if the simple quadratic $f(x)=x^2+c$ is replaced by other quadratics. It is shown, by examples, that other quadratics merely transform the Mandelbrot set, shifting it in some obvious manner. A mathematics student comfortable with function transformations will recognize that any quadratic function can be transformed into any other quadratic—this is the essence of the quadratic formula—and so it should not be surprising that nothing new is achieved by replacing one quadratic by another.

Later chapters replace a quadratic function by other polynomials, then by functions involving fractional exponents, then by a conjugate function and finally by trigonometric and exponential functions. Euler’s marvelous identity $e^{i\theta} = \cos\theta + i\sin\theta$ briefly comes into play, linking trigonometric and exponential functions in the complex plane. In all these chapters, the mathematical explanations are kept simple, and the beautiful artwork continues. The chapter, “Geometric and 3D Fractals,”