Reviews

Books from the Kraków School

Between Philosophy and Science. Edited by Michael Heller, Bartosz Brożek, and Łukasz Kurek. Kraków: Copernicus Center Press, 2013. 255 pp. Hardcover 39,90 Euro.

Church's Thesis: Logic, Mind and Nature. Edited by Adam Olszewski, Bartosz Brożek, and Piotr Urbańczyk. Kraków: Copernicus Center Press, 2014. 431 pp. Hardcover 49,90 Euro.

Logic in Theology. Edited by Bartosz Brożek, Adam Olszewski, and Mateusz Hohol. Kraków: Copernicus Center Press, 2013. 308 pp. Hardcover 39,90 Euro.

Philosophy of Chance: A Cosmic Fugue with a Prelude and a Coda. By Michael Heller. Kraków: Copernicus Center Press, 2013. 237 pp. 39,90 Euro.

Rule-Following: From Imitation to the Normative Mind. By Bartosz Brożek. Kraków: Copernicus Center Press, 2013. 234 pp. Hardcover 39,90 Euro.

The Causal Universe. Edited by George F. R. Ellis, Michael Heller, and Tadeus Pabjan. Kraków: Copernicus Center Press, 2013. 328 pp. Hardcover 39,90 Euro.

The Emotional Brain Revisited. Edited by Jacek Dębiec, Michael Heller, Bartosz Brożek, and Joseph LeDoux. Kraków: Copernicus Center Press, 2014. 371 pp. Hardcover 49,90 Euro.

The Many Faces of Normativity. Edited by Jerzy Stelmach, Bartosz Brożek, and Mateusz Hohol. Kraków: Copernicus Center Press, 2013. 362 pp. Hardcover 39,90 Euro.

In this review, I present eight books recently produced by the Copernicus Center in Kraków. These eight are not their full production, as the website of their publishing venture, http://en.ccpress.pl/, testifies. The Copernicus Center is an interdisciplinary collaboration of philosophers, theologians, scientists, and lawyers. Of these, Michael Heller, cosmologist and mathematician, philosopher and priest, winner of the Templeton Prize in 2008, is the most well-known among readers of *Zygon*, I assume. This extraordinarily fertile group represents a very coherent program that has deep roots in the intellectual culture of Kraków, as described in a very readable contribution by Bartosz Brożek and Michael Heller in this issue of *Zygon: Journal of Religion and Science*.

A characteristic title in their program is *Between Philosophy and Science*. The authors analyze in depth philosophical issues informed by science, and scientific developments that are also philosophical in kind. In this volume, Robert Audi clarifies scientific and methodological naturalism, and with such a naturalism the possibility of ontological pluralism. Roman Murawski, Krzysztof Wójtowic, and Bartosz Brożek each consider issues related to the nature of mathematics and logic. Michael Heller and Wojciech P. Grygiel reflect on quantum gravity and ontology at the Planck scale, and Helge Kragh and Bogdan Dembiński consider philosophy of science in historical and Platonic perspective. Wojciech Załuski and Łukasz Kurek focus on the human, with evolutionary anthropology and neurophilosophy, while

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Teresa Obolevitch discusses knowledge and faith in the Russian academic milieu. A great collection of original articles.

Michael Heller's *Philosophy of Chance* discusses in brief the history of probability theory, from Antiquity via Pascal, Fermat, and Jacob Bernouilli to probability theory as it was incorporated in physics in the twentieth century. In the final part, he applies insights from this tour to contemporary controversies, especially the anti-evolutionary "Intelligent Design" movement. Heller argues that chance should not be associated with the collapse of rationality; "chance" is a notion that can be analyzed in precise terms. Thus, one need not view these two options, a world designed by God or one that came about by mere chance, as opposites.

The Causal Universe reflects on cosmology, causality, and complexity. There is a substantial introduction by Michael Heller, who reflects on the migration of concepts from philosophy to science and vice versa; "causality" is an example. Mathematical cosmologist George Ellis offers an extensive contribution on the question why the laws of nature are as they are, followed by a second paper on top-down causation as key to the emergence of complexity. Jean-Philippe Uzan follows up with discussions of the emergence of complexity in cosmic history, while Derek Raine offers various challenges to the concept "top-down causality"; it might be sufficient to describe the multiplicity of coexisting causes (or of causes and the context as a landscape) as "adaptive evolution." The second part of the book speaks of causality and the structure of the Universe (Marek Kuś, Julian Barbour, Andrzej M. Sołtan, Andrzej Sitarz, Michael Heller, and Mariusz P. Dąbrowski). The third part reflects on "ultimate causality," with contributions by Bogdan Dembiński, William R. Stoeger SJ, Thomas Tracy, and the author of this review.

The second characteristic title for the program, *Logic in Theology*, is representative also of the earlier Kraków Circle (e.g., Józef Bóchenski), continuing into the present, an interest in rationality in theology, its conceptual world, and its intellectual articulation and justification. This volume has contributions by Jan Woleński, Jerzy Dadaczyński, Antonio Rotolo and Erica Calardo, Kazimierz Trzęsicki, Bartosz Brożek and Adam Olszewski, Damian Wąsek, Marek Porwolik, Marie DužžKim Solin, Pavel Materna, Jan D. Szczzurek, Mieszko Talasiewicz, and Wojciech P. Grygiel.

More focused qua topic and more voluminous qua treatment is the volume *Church's Thesis: Logic, Mind and Nature.* Alonso Church's Thesis, from 1936, is about calculable functions; only those that are recursive are computable. The same year, Alan Turing came up with a similar idea, formulated in terms of a procedure for an abstract machine. The first decades of the twentieth century were a most interesting period in the philosophy and foundations of mathematics, with the optimism of the Hilbert program, undermined by the work of Kurt Gödel, the constructivist or intuitionist approach developed by L. E. J. Brouwer and by Hermann Weil, the conceptualization of provability and algorithms by Alan Turing, Alonso Church, and John von Neumann, and much else. Church belonged to that same class of philosophically sensitive mathematicians. This volume has substantial articles on philosophical aspects, logical aspects, the relation with ideas about abilities of the mind, and on a physicalist version of the thesis. Given the conceptual significance as well as the widespread use of algorithms in contemporary technology, this meta-mathematical study is highly relevant, though

the contributions are written more for specialists than for those without substantial expertise in logic and mathematics.

Bartosz Brożek's *Rule-Following: From Imitation to the Normative Mind* also touches upon algorithms, or rather rules, in mathematics, linguistics, and morality. Such rules can be descriptive and prescriptive. For the analysis in this book, the point of departure is Ludwig Wittgenstein, while neuroscientific insights about imitation, language, language, morality, and mathematics are discussed in subsequent chapters. The author comes to a revised version of the "three worlds" distinguished by Karl Popper: the world of physical states, the world of mental states, and the conceptual world of ideas. Specific to Brożek's view is that world 3 is based not only on mental processes (world 2), but also rooted in social interactions that propagate patterns (world 1). He thus seeks to steer a course that avoids a peculiar Platonic view of mathematics as disconnected from reality, while at the same time making the "objective" strength of mathematics conceivable. And thus, he suggests a response to the philosophical question why mathematics is so effective in understanding the physical world.

In *The Many Faces of Normativity* somewhat similar issues are discussed by various authors. Robert Audi analyzes the extent to which normativity can be naturalized. Jan Woleński reflects on similarities between normative and epistemic discourse. Jaap Hage discusses rules, and the way they differ from facts. Anna Brożek and Jerzy Stelmach both discuss "the naturalistic fallacy" and its limitations. After these papers on foundational and conceptual issues, the second section turns to contemporary debates on claims about the normativity of language (Bartosz Brożek and Aeddan Shaw), the normativity of mathematics (Mateusz Hohol) and legal philosophy (Marcin Gorazda), while Marta Soniewicka argues that value-based views of normativity by Max Scheler and Nicolai Hartmann are preferred over Immanuel Kant's view of normativity rooted in obligation. The third section considers normativity in the context of the sciences, especially psychology, neuroscience and evolutionary theory, with contributions by Edward Nęcka, Marcin Siwek, Rafal Jaeschke, Dominika Dudek and Natalia Czyżowska, Bartlomiej Kucharzyk, and Woljciech Załuski.

The Emotional Brain Revisited considers the emotions. Too often considered as the antithesis of rationality, emotions are relevant for consciousness and introspection, and hence for rationality as well. In the first group of contributions, the neurosciences are central. Joseph LeDoux, author of the book *The Emotional Brain* (1996), discusses recent research. Regina Sullivan and Margo Landfers speak of animal studies and infant attachment. Justin Kim and colleagues concentrate on the amygdala, a particular brain structure associated with anxiety. Jacek Dębiec offers a brain based view of emotions, while Bram Heerebout and Hans Phaf consider computational models. In the second group, psychology takes the center, with contributions by Nico Frijda and James Russell. The third group of papers takes up the philosophical issues, with essays by Łukasz Kurek, Mateusz Hohol and Piotr Urbańczyk on social cognition, Wojciech Załuski on rationality, Bartosz Brożek on morality, and Dominika Dudek on concepts of mental illness.

Seeing these eight volumes side by side, I am impressed by the work done by these Polish colleagues and their international guests. A minor desire would have been for more volumes to have indexes, at least by personal names. The

books are well designed, aesthetically pleasing. More important, the Kraków group around Michael Heller has an interesting agenda of understanding human rationality and the rationality of the world, in relation to science, mathematics, and morality. A religious concern remains in the background, but does not distract or dominate: the human intellectual quest is by itself enough. Though all this work is interesting, my own favorite from these books is Bartosz Brożek's *Rule-Following,* as it seeks to understand the "objectivity" of mathematics and morality in harmony with their human character. Worth rereading.

WILLEM B. DREES
Professor of Philosophy of the Humanities, Dean
Tilburg School of Theology, Tilburg University, Tilburg, the Netherlands
w.b.drees@tilburguniversity.edu

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The Age of Scientific Naturalism: Tyndall and His Contemporaries. By Bernard Lightman and Michael S. Reidy. London: Pickering & Chatto, 2014. 256 pp. Hardcover $99.00.

John Tyndall died of poisoning. From 1890 to 1893, he found himself bedridden, struggling with illness. He was in the habit of taking doses of chloral hydrate at night to help him with his insomnia, and every other day some sulphate of magnesia for his constipation. Near the end, his wife, Louisa, 25 years his junior, administered the dosages to him.

In 1893, on a Monday morning, Tyndall asked Louisa for a spoonful of magnesium. It was dark, and his bedside table was littered with bottles. Louisa took a bottle and poured a spoonful and served it to him. He took a big gulp and, tasting it, said, "There is a curious sweet taste." Immediately Louisa realized she had accidentally given him a spoonful of chloral. She turned to him and said, "John, I have given you chloral." He replied, "Yes, my poor darling, you have killed your John" (see account in "Mrs. Tyndall's Fatal Error," *New York Times*, 1893).

The great physicist John Tyndall died that same evening. Stricken with guilt, Louisa spent the rest of her life attempting to resurrect him. She collected his journals, correspondence, and all unfinished writings for the purpose of publishing a massive *Life and Letters*. No *Life and Letters* ever came to fruition. She died in 1940 at the age of 95.

The current volume under review is a renewed attempt to resurrect the life and work of John Tyndall. Edited by Bernard Lightman and Michael S. Reidy, the essays in this collection originate from two conferences specifically organized around the work of Tyndall, including the "Evolutionary Naturalism Conference" held at York University in 2011 and "John Tyndall and Nineteenth-Century

Science Workshop and Conference" held at Montana State University in 2012. Pickering & Chatto will also begin publishing Tyndall's correspondence in sixteen volumes, beginning in 2015.

The Age of Scientific Naturalism is divided into three parts. Part I, "John Tyndall," highlights Tyndall's "unflinching defense of a naturalistic world view" and the role he played "within the contested nature of science in the Victorian era." Tyndall was known for his "flamboyant lectures, which mixed practiced showmanship with extravagant experiments," presenting "science as an exhilarating spectacle." The essays in this first part stress Tyndall's research and the construction of his public persona. Elizabeth Neswald's opening essay, "Saving the World in the Age of Entropy," connects Tyndall with philosophical threads and ideological biases of the mid-nineteenth century, particularly German *naturaphilosophie*. In his work, for example, Tyndall marginalized the law of entropy in "favor of a balanced world of cycles," in much the same way that German materialists did, proposing a "living nature in an eternal process of becoming." Tyndall emphasized "the role of the sun in supporting life," and drew "a picture of a nature embodying organic unity." This verges on "nature worship," and Neswald emphasizes that Victorian religious agnosticism "differed little from Christian theology." According to Neswald, "for Tyndall . . . god was nature." Following the work of Ruth Barton, Stephen S. Kim, and Tess Cosslett, Neswald notes that "the use of religious language in works of popular science was widespread in this period," and that Tyndall's language was particularly indebted to the "natural supernaturalism" of Thomas Carlyle. "Tyndall's private writings, his journals and letters, reveal a view of nature and the universe that sees a creative power that could not be fully comprehended through science alone." In a letter to his close friend Thomas Archer Hirst, for instance, Tyndall writes that "the universe is a body with life within it, and among it, and through it, permeating its every fiber . . . Everything in nature is in the act of becoming another thing." These sentiments were due to Tyndall's reading of "German philosophers," which he "imbibed . . . them through the interpretations and writings of Thomas Carlyle, who himself was deeply indebted to German idealist and romantic philosophies." Indeed, Tyndall was very much encrusted within this tradition, so much so that modern interpretations, such as viewing him as a progenitor of global warming, become problematic, as Joshua Howe shows in the following essay, "Getting Past the Greenhouse." Howe criticizes the Tyndall Centre for Climate Change Research at the University of East Anglia in the United Kingdom for co-opting Tyndall as a forefather of modern climate science. Also criticizing recent "histories" of global warming, Howe writes that the "biography of global warming is ahistorical." Such "presentist biography," he argues, "has consequences for the way we understand the role of science in the twenty-first century politics of climate change." These stories "feed myths and misunderstandings about contemporary and historical issues, both academic and otherwise." Jeremiah Rankin and Ruth Barton, in the next essay, "Tyndall, Lewes and Popular Representations of Scientific Authority in Victorian Britain," compare the popular science writings of Tyndall and those of literary critic George Henry Lewes, showing how porous the boundaries between public and private science, the laboratory and the field, and the popularizer and practitioner, were during the mid-Victorian period. Both Tyndall and Lewes,

they argue, "pursued scientific research, wrote for the periodical press, addressed topics beyond their specialist expertise, and devoted considerable effort to popularizing a naturalistic version of science." Indeed, both men used many of the "same tropes in their self-representation as reliable and authoritative expositors of science."

Part II, "Scientific Naturalism," examines scientific naturalism itself, demonstrating that *science* was still in a state of flux in the late nineteenth century. Who were the "scientific naturalists" turns out to be an increasingly complex question. Looking at some of the "less obvious scientific naturalists," these essays go beyond the myopic focus on Huxley and Tyndall, and examine the complex personalities of Herbert Spencer, William Kingdon Clifford, William Huggins, and Alfred Newton. Spencer, for example, planted his philosophical roots in the soil of *naturaphilosophie* and evolutionary deism. According to Michael Taylor, in his "Herbert Spencer and the Metaphysical Roots of Evolutionary Naturalism," Spencer underscored the "popular and fluid definitions of scientific naturalism." Rather than an empiricist and materialist, Taylor argues, Spencer's philosophical system reveals "elements of transcendentalism and rationalism, as well as an awareness of the limits of knowledge that verged on mysticism." Spencer undoubtedly had metaphysical sources, such as Erasmus Darwin and Robert Chambers's "evolutionary deism," which "articulated a vision of cosmic evolution that presented a story of progress from the nebulae to human society." Another metaphysical source was German transcendental biology or *naturaphilosophie*. Despite his neglect in contemporary works, Spencer's impact on Victorian intellectual life was immense. Taylor persuasively argues that "Spencer's evolutionary naturalism had its roots deep in metaphysical theories that were far removed from empiricism and materialism." Josipa Petrunic follows with an essay on the "Evolutionary Mathematics" of Clifford and his beliefs in the Spencerian process of evolution, which included the search for a foundation for a new morality within scientific naturalism. In the end, according to Petrunic, Clifford became a "more thoroughgoing evolutionary naturalist than either Huxley or Tyndall, as well as many others amongst the older generation who founded the X-Club." Robert W. Smith's essay, "The 'Great Plan of the Visible Universe,'" looks at astronomer Huggins who, although rejecting traditional natural theology, sought a conception of the unity of nature founded upon divine design. A leading pioneer in the development of astrophysics, Huggins's work, according to Smith, was shaped by deep "religious sensibilities." However, this was only the Huggins of the mid-1860s. This early Huggins "saw very powerful evidence of design when he viewed the heavens." Yet by the 1880s and 1890s, Huggins's opinions had decidedly shifted to something more resembling Frank M. Turner's "scientific naturalist." Unfortunately, why this shift occurred, says Smith, is rather obscure. Jonathan Smith, in the final essay in this section, "Alfred Newton: The Scientific Naturalist Who Wasn't," shows how Newton applied Darwinism to his own work in ornithology, but was "restrained and cautious in his public endorsement of Darwinism." Indeed, he did not "share the broader agenda of scientific naturalism." Newton was a clear example that "one could be a Darwinian without being a scientific naturalist."

Part III, "Communicating Science," looks at the disparate "modes of communication, including public lectures, scientific meetings, personal correspondence, newspaper editorials, pamphlets, and even town-hall meetings and church gatherings" that supported science during the Victorian period. Janet Brown, in the opening essay, "Corresponding Naturalists, "offers an engaging "correspondence-history" of the scientific naturalists, and "how epistolary exchange helped shape the very foundation of modern science, with its emphasis on *evaluation*, *adjudication*, *authentication*, *prioritization* and *distribution* of the latest scientific research" (my emphasis). In the same vein, Melinda Baldwin's essay, "Tyndall and Stokes," offers a more detailed examination of the epistolary exchange between Tyndall and mathematician and theologian George Gabriel Stokes. Although Tyndall and Stokes "differed radically in upbringing, temperament and religious orientation," these ideological differences did not prevent them from maintaining a friendship, thus problematizing the notion of an antagonism between science and religion at the time. Baldwin demonstrates the central role their correspondence played in shaping the physical sciences in the Victorian period. The Tyndall Correspondence Project has found some 200 letters between Tyndall and Stokes, and it seems that Stokes, Baldwin suggests, "shaped both Tyndall's papers and Tyndall's idea about scientific theories." In other words, Tyndall respected Stokes's scientific expertise, consulted him on scientific theories, and even called on him to review some of his essays. Stokes was one of the North British physicists who have been portrayed as the great antagonists of the scientific naturalists. But the Tyndall-Stokes correspondence suggests a more complex picture. Bernard Lightman concludes with an essay on the "Science at the Metaphysical Society." Much of what he has to say here depends on the research of Alan Willard Brown's masterful *The Metaphysical Society: Victorian Minds in Crisis, 1869–1880* (1947), but Lightman distinguishes himself from Brown's politically idealistic philosophy. Most importantly, Lightman shows that religious members of the society were not anti-science; rather, "they simply had their own definition of what it was, the role it should play in society, and the broader ramifications of its findings."

This set of essays complicates our conventional understanding of Victorian naturalists. "The contest for cultural authority," Lightman concludes in *The Age of Scientific Naturalism*, "was not only between the Anglican clergy and scientific naturalists. Feminists, socialists and others were claiming that they were qualified to provide leadership, and that contemporary science supported their claims." Furthermore, the scientific naturalists were not mere "agnostics," in the contemporary sense of the term, as "rationalists." Their ideas, and ideals, were infused with metaphysics, a romantic sense of nature, and, indeed, a deep reforming spirit, of knowledge, society, and religion.

JAMES C. UNGUREANU
The University of Queensland
jcungureanu@gmail.com

Flourishing: Health, Disease, and Bioethics in Theological Perspective. By Neil Messer. Grand Rapids, MI: William B. Eerdmans, 2013. xvii + 238 pp. Softcover $35.00.

The book reviewed here is the third monograph by British author Neil Messer dedicated to the interdisciplinary discourse between theology and bioethics. Messer, a Cambridge trained theologian and ordained minister of the United Reformed Church, is professor of theology and presently head of the Department of Theology and Religious Studies, University of Winchester, UK. While in his two earlier books Messer dealt with *Selfish Genes and Christian Ethics* (2007) and *Respecting Life: Theology and Bioethics* (2011), in this book he attempts to develop theologically sound concepts of health and disease in a well-informed, mainly—but not exclusively—British dialogue with contemporary philosophies of health. He also dialogues with disability advocates for the sake of gaining a genuinely Christian perspective on healthcare in order to stimulate a "reflection on Christian practice" cognizant of "critical questions from other perspectives and disciplines" (p. 50) in the hope of shaping Christian healthcare accordingly.

The book consists of four clearly structured chapters: (1) philosophical accounts of health, disease, and illness (pp. 1–50), (2) disability perspectives: critical insights and questions (pp. 51–101), (3) theological resources for understanding health and disease (pp. 103–61), and (4) theological theses concerning health, disease, and illness (pp. 163–200), followed by a conclusion (pp. 201–10), a bibliography (pp. 211–26), and a general index (pp. 227–38).

Admitting that "questions about the meaning of health, disease, and illness . . . can at times seem arcane and abstruse" (p. 210), Messer first circumspectly plows the stony fields of health definitions and current disability perceptions. This he does, not for the sake of idle academic exercise, but with the "essentially *practical* [!] purpose" in mind of highlighting and making accessible a "mutually critical encounter" with theology. He offers philosophical statements on health and divergent perceptions of disability which guide actual healthcare and drive social interaction, because he is convinced that striving for a well-informed, sound answer has "the most concrete of practical implications for healthcare and social and political life" (p. 55; see also 197–200).

However, before getting to the interdisciplinary discourse proper, Messer inserts with chapter 3 a section in which he gives an account of the sources for a Christian answer to the challenges posed by today's biomedical possibilities and the contemporary debate about disability. This is done to enable representatives of other disciplines to understand the theological argument and join in the discussion while at the same time explicitly reaffirming these sources, namely "the Scriptures and the Church's ongoing tradition of reflection on them" (p. 103). But, following Stanley Hauerwas, Messer also is keen to pay "attention to the practice of the Christian community" and its ministry of healing and caring as another "important source" (p. 107), because "Christian practice might serve to destabilize dominant perceptions of normality, health, and flourishing" (p. 151 f). Messer refers to Scripture and scriptural passages in a nonfundamentalist manner since the "final authority . . . is to be found in God's self-revelation in Jesus Christ, to which the Scriptures bear witness" (p. 105). He also, besides referring to Dietrich Bonhoeffer

in passing, takes recourse in Karl Barth's reflection on health as "strength for human life . . . to *be* [!] the creatures God means us to be" (p. 136, see also p. 138) and to Thomas Aquinas's "teleological account of human being and action" (p. 142) to show that human life is "directed towards both proximate and ultimate ends, which are identifiable as *good* [!] insofar as they contribute to *the good of being this kind of creature*" [!] (p. 149). His discussions of "Theologies of Disabilities" (pp. 151–61) serves as a reminder that "the ultimate fulfillment of . . . proper goods, goals, and ends" of human beings "is an eschatological promise" (p. 160).

Having thus laid a solid foundation for a meaningful interdisciplinary discourse, Messer now feels comfortable enough to frame "theological theses concerning health, disease, and illness" (163), sixteen in all, which culminate in two "practical implications" (pp. 197–200), namely (1) "a clear, albeit qualified, theological affirmation of the work of medicine and healing" which is resistant to "a false opposition between medicine and the Christian healing ministry" (p. 197) and (2) "the call to continue caring when cure is no longer possible" which certainly will "transform the way suffering is understood and experienced" (p. 199). In his final "Conclusion" the author briefly addresses three areas of medical ethics in which the foregoing reflections come to bear heavily—the therapy/life-enhancement distinction, resource allocation, and the quality-of-life debate—inferring that when "we ask *theologically* [!] what we should understand by health, disease and illness, it quickly becomes apparent that our answers depend on some of the deepest of Christian convictions about human life before God and in the world God has made" (p. 210).

Messer, on the whole, articulates his complex argumentation very clearly. Yet, his writing is quite redundant, which might be owed, as the reviewer assumes, to the author's attempt to accommodate modern reading habits where books are read not in one stretch any longer, but piecemeal and with many time lapses in between diverting attention. Whatever the case may be, redundancy makes the study of books somewhat tiresome, particularly those where, as in this case, the main body of text consists in surveying "selected debates" (p. 51). This in no way diminishes the quality of Messer's work nor his innovative approach in using the Aristotelian–Thomistic concept of "flourishing" to spotlight the proper attitude toward health, disease, and disability, as well as to indicate the genuine task of medicine, healthcare, and bioethics. One only would have wished he had also considered the substantial reflection on a Christian understanding of health and healing as previously done by his fellow countryman David Jenkins and the Christian Medical Commission (CMC) of the Geneva-based World Council of Churches (WCC).

CHRISTOFFER H. GRUNDMANN
John R. Eckrich University Professor in Religion and the Healing Arts
Valparaiso University, Valparaiso, IN, 46383
Christoffer.grundmann@valpo.edu

The Philosophy of Human Evolution. By Michael Ruse. Cambridge: Cambridge University Press, 2012. x + 271 pages. Softcover $26.99.

Michael Ruse is a gifted and prolific explorer of the territory where science and philosophy spar. In *The Philosophy of Human Evolution* (*PHE*) he shows us how this conflicted terrain has changed over time. Ruse is advancing his commentaries on evolutionary biology, human evolution, progress, knowledge, morality, sex, sexual orientation, race, eugenics, and medicine. *PHE*, thus, brings us into relevant encounters with the work of many other philosophers, biologists, paleontologists, and evolutionary theorists. Ruse is concerned with the question of how the study of evolution has changed and how questions and approaches, once apparently of central importance, may now be items relegated to notes of historical interest while other approaches increase in usefulness.

In chapter 1, we are shown that both Darwin and his contemporaries lived in a world in which one kind of proof did not serve to resolve all the scientific questions. The situation persists to this day. There are those areas of experience where reductionistic science provides adequate explanations and those areas where it does not. Darwin sought a scientific theory that could explain the similarities and diversity of the natural world. Physics and chemistry seemed to be well-described by reductionistic approaches, but changes in species of animals and plants were not convincingly explained by what was known in Darwin's day. After much thought and diligent investigations including his experiences in the Galapagos Islands, Darwin was able to connect the idea of artificial selection in domestic animals with what he saw occurring in the wild species—specifically selection by the multiple, complex interactions of nature itself. Ruse serves us tasty platters of exploration and deliberation regarding natural selection that have provided delectable munching over the intervening century and a half. The historical approach in *PHE* strikes this reviewer as highly informative and engaging.

However, there are signs that this particular work may have been done in some haste or perhaps in an attempt to be too convivial. Sometimes the text is unclear or may even convey misunderstanding to those unfamiliar with evolutionary studies. As an example, on pages 25 and 26, Ruse presents Sewall Wright's diagram of the "genetic landscape" (as labeled in Figure 1.8). He then engages in a very troublesome description of the diagram: "Aided, I hasten to say, by one of the brilliant metaphors of evolution, the 'adaptive landscape,' which shows visually how genes climb up to the tops of adaptive 'peaks,' and yet how also they might find themselves in maladaptive 'valleys.'" Note that there are no scary quotation marks around "climb" or "find," but genes don't climb or find. This mode of expression is simply misleading. The surrounding text never gets around to the idea that it is organisms that are selected in nature. Wright's diagram is meant to convey the selective relationship between an organism (with its entire genome) and the environment(s) the organism encounters. Some places in the landscape are conducive of evolutionary success of a particular genome, others are neutral, and some are not conducive to survival of that genome.

A strange and unnecessary claim is made in the chapter on "Progress," p. 104: "We humans are still here, and we are the final product of evolution (or one of the final products)." A more accurate statement would be that many, many creatures obviously continue to exist with us and, thus we are all current survivors, hopefully not end products. The claim is totally unnecessary and stands in direct contrast to a

long, beautiful quote from Darwin on the same page that makes our real condition perfectly clear, ending as follows: "... from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved."

Other questionable statements appear in this chapter on "Progress." Perhaps the most troublesome is on page 127, where Ruse quotes himself (1996): "My own take is ... that no failure will quell the feeling that somehow there really is progress up to humankind.... Simpson pointed out, you are showing that you have the ability to ask about whether there is progress. This seems to give us special abilities. Either way, we won—and that is surely what progress is all about." What is the author trying to convey here, to what does he wish to have us give assent?

A particular indication of haste occurs on page 140, where a long quote from Kant is repeated, exactly, about halfway down the same page. A bit later (p. 148) Ruse agrees with Nietzsche and Plantinga that "Darwinian evolution cares nothing for truth, only for survival and reproductive success. To use a memorable phrase of the philosopher Pat Churchland, Darwinism is the science of the 'four F's': fighting, fleeing, feeding, and reproduction. There is nothing here about knowledge and truth and objectivity." Well, perhaps not in the four F's *per se*, but knowing or remembering the best pathway to use to flee away from a predator goes pretty far toward very useful knowledge, or so it seems to this reviewer.

A last strange offering to be recounted by this reader, but by far not the last in the book: "... there is surely some truth in this ... that sex exists because in that way useful new variations (mutations) can be gathered together quickly in one organism" (p. 186). However, in organisms with meiosis, the development of gametes "re-sorts" chromosomes and through crossing over of genetic material between chromosomes re-sorts the genetic material itself. Sexual reproduction breaks up, rather than gathers, genomes. Thus, the quote conveys a serious misunderstanding.

To his immense credit, Ruse does introduce the history of the very powerful idea of consilience and shows how it substantiates the proof and reality of a hypothesis. It is of great interest to see how Darwin's contemporary William Whewell (1840) characterized "a type of explanation, what he called a 'consilience of inductions,' [which] was just what was needed when you are trying to explain using a cause that no one sees and that may be unobservable" (p. 9). Whewell's consilience is the approach to proof that is needed for the nonreductionistic decisions or conclusions—think about coming to believe that someone loves you—it is the accumulation of indications which add up to reasonable certainty and trust. The author brings the consilience tool into service at several points in *PHE* and to very good effect.

PAUL G. HELTNE
Director
The Ethopoiesis Project, President Emeritus of the Chicago Academy of Sciences,
4001 N. Ravenswood, #401, Chicago, IL, 60613
heltne@chias.org

Evolutionary Religion. By J. L. Schellenberg. Oxford: Oxford University Press, 2013. 192 pp. Hardcover $34.95.

Schellenberg's book on evolutionary religion has two main parts: a pessimistic part and an optimistic part. In the pessimistic part he argues in favor of evolutionary skepticism, a claim that according to what evolution teaches us and by reflection on the immaturity of our species, we ought rationally to doubt the truth of some religious claim and also the falsity of all religious claims (p. 49). The Door that Darwin has opened for us directs us toward the fact that the slow geological and biological processes leading to evolution of our species in the past thousand millions of years will go lumbering on, generating new life changes in a very long time from now (p. 23). "But anyone who really makes the shift from human to scientific time scales will see that we are still in the beginning" (p. 4). We are now in the infancy of our species regarding some two hundred thousand-year history of homo-sapience in comparison with three and a half billion years of evolutionary development (p. 3). Because we are evolutionary immature many of our beliefs are doubt-worthy. But to what extent could this skepticism spread? Schellenberg proffers some criteria to specify the range of such an evolutionary skepticism. According to him we ought rationally to be skeptical in all subject matters in which we are dealing with beliefs that are *precise* (as opposed to vague, where the content of the belief is so specifiable that is capable of having serious alternatives), *detailed* (as opposed to simple, where the content of our belief is multifaceted and has many parts, so easily it could be undermined by alternative parts), *profound* (a belief whose content includes a deep understanding of how things are in the world, so it will have serious and enormous alternatives), *attractive* (human beings generally would wish the belief to be true, so it is vulnerable to be accepted wishfully rather than rationally), *ambitious* (the belief concerns matters that it is normally difficult for human beings to recognize, we should stop relying on it because of our immaturity), and *controversial* (pp. 49–51). Surprisingly, beliefs in traditional religions have all of these six properties and so they are "vulnerable," "premature," "inappropriate," and "doubt-worthy" (pp. 64–66). It is noteworthy that Schellenberg here demonstrates that old pessimism, based on naturalism, is premature and doubt-worthy as well (pp. 58–64). The conclusion of the first pessimistic part of the book is as follows: "Surely the very least to be concluded from our *limitations* is that a long process of very high-quality religious inquiry would be required to justify religious or irreligious belief. And surely the very least we can conclude from our *immaturity* is that we have not yet engaged in such inquiry. Thus, even more obviously than before, religious and irreligious belief are shown to be inappropriate and intellectually unjustified for beings such as we are" (p. 69).

In the optimistic part of the book he enumerates the features of a possible long-term evolved future religion, what he calls a new form of religiousness that is diachronic instead of synchronic, cognitively modes, forward-looking and patient, and attentive to the evolutionary benefits of redesigned religion (p. 75). He distinguishes between three types of transcendence: metaphysical (what factually is something more than or deeper than the world of physical nature explored by science), axiological (when its excellence and intrinsic value exceeds that of anything

found in nature), and stereological (what being rightly related to it will make for more well-being and fulfillment for the creatures than can naturally be attained) transcendence (p. 94). The ultimate divine reality may have all of these spheres of transcendence either ultimately (in a strong sense) or weakly. The nature of ultimate reality in the proffered evolutionary religion, which could be accepted or *imagined* that (as opposed to believed that) exists by future intelligent inhabitant of the earth is triply transcendent; however this imaginable concept of divine offers no additional details as to the nature of its transcendence (thin concept of ultimate reality as opposed to thick concept) (pp. 95–99). Based on these distinctions, he defines *faith* in Ultimism (the claim that there is a triply transcendent ultimate reality) as an *imagination that* a thin and strong transcendent ultimate reality exists (p. 99).

He argues that the evolutionary religion has several advantages over traditional religions especially theistic religions. Some of them (which seem more important to me) are as follows:

(1) Tolerance: At every stage we must suppose ourselves to be at the beginning of a long process of religious development. Given this we should think of ourselves as relatively ignorant. Because of this admitted ignorance we should respect any other experience at all, whether of one's own community or with others. We ought to be open-minded and attentive to ideas of other religions and modes of thought as well as science, art, and philosophy in order to enrich our understanding of the Truth and the ultimate reality (p. 108). This type of tolerance and open-mindedness can hardly be found among believers in traditional religions who think that the whole truth is in their hands.

(2) Avoiding self-centeredness: Evolutionary skepticism as the main constituent of evolutionary religion leads religious persons to community-mindedness and collaborative thinking as opposed to pursuing egoistic and self-centered concerns. "And looking for value in unexpected places, one will surely find it in all the frustrating but at the same time fascinating twists and turns of other minds" (p. 113). Understanding this vital importance of religious community for truth-seeking and flourishing of every individual, will lead one to put away egoistic concerns.

(3) Looking forward as opposed to looking backward: Evolutionary religious people see religion as a developing process, and think of human beings as just getting started on the path toward religious insight and maturity. "This is just the opposite of the usual religious approach, which involves looking back in time to the authorative pronouncements or example of founder figures" (p. 83). The positive point of this forward-looking is to allow more time for making progress toward truth in such a very controversial, ambitious, and profound subject matter.

Despite the fact that I admire the advantages of the proposed evolutionary religion, I have two concerns regarding the pessimistic and optimistic parts of this doctrine.

First, Schellenberg's basis for the evolutionary skepticism thesis, as he emphasizes and explains in the first chapter and throughout the book, is the deep

time thesis for the future of human life. He believes that it is epistemically possible for human species to evolve for millions or even billions of years ahead. This epistemic possibility justifies the claim that possibly we are in the infancy of our evolutionary history and so we should embrace religious skepticism. But, there are serious philosophical arguments and also scientific investigations that undermine the epistemic possibility of deep time thesis. "Epistemic possibilities are claims we don't have any good reason to believe false, given our present evidence" (p. 42). Although Schellenberg has observed both of these reasons, he easily ignores their undermining effect on the epistemic possibility of the deep time thesis. The *doomsday argument*, introduced by Brandon Carter and advocated by John Leslie, has been used by Peter van Inwagen to argue that "there is a significant probability that the human species is going to become extinct: and not in a million or even 10,000 years, but within the next few centuries" (van Inwagen 2005, p. 251). Contra Schellenberg's claim that human near-extinction "is a possibility brought home to us by familiar doomsday scenarios involving such things as the impact of an enormous asteroid or the eruption of megavolcanoes" (p. 17), van Inwagen's argument is a type of inference to the best explanation of what we can see now in our human life and situation. Seeing the extraordinary population explosion of the last 200 years puts us in a state similar to one who looks at the coast of an island from its central crowded point. The island is very sparsely populated within several miles of the coast. At nearer places to her state the population increases. Very near to her the population increases extraordinarily. Would it be not reasonable for the observer to conclude that the island's center is just a few miles inland from her? It seems to me a reasonable implication. However, as van Inwagen puts it rightly, the observer should explain away the possibility that the island is too large (van Inwagen 2005, p. 260). Here the scientific inquiries may provide independent reasons for thinking that the human species will come to an end soon.

Ironically, evolutionary investigations provide us, among other investigations, a source of undermining the deep future possibility. As Schellenberg himself has noticed (p. 30), in a paper published by the US National Academy of Sciences colloquium on "The Future of Evolution" held in 2000, Woodruff has declared that

> In response to the on-going rapid decline of biomes and homogenization of biotas, the panelists predicted changes in species' geographic ranges, genetic risks of extinction, genetic assimilation, natural selection, mutation rates, the shortening of food chains, the increase in nutrient-enriched niches permitting the ascendancy of microbes, and the differential survival of ecological generalists . . . . If current area-species curve-based projections are correct, we could lose up to 50% of the planet's species in the next 1,000 years. . . . Under even the most favorable speculations about the 1,000-year situation, there was serious concern about the ability of biodiversity to "bounce back" given the current prospects for tropical forests, wetlands, and coral reefs. (Woodruff 2001, 5471, 5472, 5473)

Despite these scientific inquiries, Schellenberg claims that scientists at this colloquium were mostly concerned with the next 100 or 1,000 years, and if they turn their gaze to the really deep future they will be quietly optimistic (p. 31). It seems to me that one can infer from these scientific inquiries that we

are currently living in an evolutionary crisis, heading toward mass extinction. This available evidence clearly discredits the epistemic possibility of future deep time. So I suggest that Schellenberg's skeptical thesis will be undermined as well.

My second concern is due to his optimistic and positive thesis, which is called Ultimism. According to it people in the future will have a nondoxastic attitude (imagination) toward a thin concept of transcendental ultimate reality. Perhaps so, but if some people with more powerful cognitive faculties think, or imagine, or accept, or assume that such a transcendent reality exists then what would prevent them from attributing to him some essential attributes? If they have some religious experiences then it is not surprising to interpret their experiences as direct awareness of that reality who speaks to them, who advises them and guides them. Therefore the concept of ultimate reality will not remain *thin*. It will be thicker through day-by-day new religious experiences. Every new religious experience will enrich and deepen the old ones. So I think, and it is my main objection to Schellenberg's argument in his book, that ironically the evolutionary religion which Schellenberg imagines not only does not confront traditional religions but also conforms to theism—a claim that a thick and strong ultimate reality exists and is a source of morality for and well-being of human beings. Keith Ward draws attention to the similar point as well. He says that Schellenberg's concept of Ultimism pictures the ultimate reality as ultimately valuable and the source of an ultimate good in which we can participate, which participation can probably only happen for many after death (p. 155). "I have to say this sounds like theism to me, especially since he espouses Anselm's formula for the ultimate, 'that than which no greater can be conceived'" (Ward 2013).

Schellenberg has tried to generate a new synthesis from traditional religion's thesis and secular evolutionary science as the antithesis to be both religious and rational in order to be well fitted to stimulate and guide the next stages of human evolution (p. 158). His book is written eloquently and is thought-provoking. However, despite the fact that Schellenberg's thesis in this book is original and subtle, neither the pessimistic nor the optimistic part of his main argument in favor of evolutionary religion seems productive.

Ebrahim Azadegan
Assistant Professor, Department of Philosophy of Science
Sharif University of Technology, Tehran, Iran
Ebrahimazadegan@gmail.com

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