probably should have been titled "Climate Change and Christian Stewardship," as this is the subject addressed. An overview is provided for the science of human-induced climate change, how the discussion is often derailed by political polarization, and what we should be doing as stewards of God's creation. Some will argue that the acceptance of human agency in the earth's warming trend is overstated, though a good case is made for seeing ourselves as caretakers of the earth, rather than simply as users. The final chapter probably should have been wrapped into the previous one, for it continues the subject of stewardship. The lesson is just two questions, both tied to climate change. An appeal is made for churches to be more active in discussing the impact of human activities on the earth's climate, and recommending active participation in solutions.

I recommend the book for groups already comfortable with the possibility that science may have something to say about our understanding of scripture or earth stewardship. It will not be as useful for groups looking for a strong scriptural defense before giving science an ear.

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SOCIAL SCIENCE

MINDS MAKE SOCIETIES: How Cognition Explains the World Humans Create by Pascal Boyer. New Haven, CT: Yale University Press, 2018. 376 pages. Hardcover: $30.00. ISBN: 9780300223453.

Encompassing updated research findings from evolutionary anthropology, history, economics, and social psychology, Boyer has embarked on an arduous and audacious task to provide psychological and cognitive underpinnings of a wide range of human social behaviors. Within the framework of evolutionary psychology, Boyer frequently provides comparative as well as historical accounts of human social behaviors to explain how such behaviors have evolved. While doing so, Boyer emphasizes the importance of cognitive underpinnings of social behaviors and explains how cognitive systems played a role in shaping and influencing various social behaviors.

Boyer suggests that at the core of understanding various social behaviors lies the functional capacity of human mind. This implies that we need a set of cognitive capacities or detection systems that enable people to extract information from the social world—termed as the "intuitive inferences systems." Boyer argues that there exist a plethora of these intuitive inference systems shaping, guiding, and directing cognitive processes of information pertaining to specific social contexts. These intuitive inference systems share some common properties: (1) they operate outside consciousness; (2) they are specialized; and (3) the operation and function of these systems can be best understood from the evolutionary perspective. Under such assumptions, Boyer presents how these systems operate and function in group formation and conflict (chap. 1), junk culture, including odd belief, rumors, and conspiracy theory (chap. 2), religion (chap. 3), family (chap. 4), societal cooperation and justice (chap. 5), and human society (chap. 6).

In the first chapter, Boyer focuses on the operation and function of the cognitive system in group identity and group formation. He begins the chapter by describing one's inherent tendency toward group formation and antagonism toward out-group members (group conflict). Coalitional psychology emerged to understand the psychological and cognitive underpinnings of human alliance that enable people to form a group. Cognitive systems shape and reinforce the coalition by playing a vital role in recognizing in-group members in order to build solidarity and identifying out-group members based on accent and phenotype. For example, race is one of the most salient and explicit ways to predict social alliance. Furthermore, the system makes implicit statistical estimations of different out-group members, which have significant impacts on people's physical health as well as attitude. As such, one's survival and well-being hinges upon group cohesion and continuity, and cognitive systems play a vital role in group solidity and conflict.

In the second chapter, Boyer focuses on the functional role of cognitive processes involved in seemingly unreasonable and odd belief with little value—termed "junk culture." In chapter 3, he defines religion as a subset of supernatural concepts systematically structured and codified. In light of evolutionary psychology, religion is adaptive and enhances fitness by promoting one's commitment to a group and cooperation with others. Boyer proposes three cognitive representations of religion: (1) an interesting fiction; (2) a way to cultivate spiritual self; and (3) a way to promote group solidarity and intergroup hostility.

In chapter 4, Boyer presents the cognitive computation underpinning sexual preference, identity, and behavior. Sexual psychology has heavily relied on the theory of evolution, which is supported by a wealth of evidence. However, according to Boyer, this explanation also poses a challenge because the notion of fitness is difficult to measure and it takes a

long time to evaluate its effect. As a result, people are more likely to rely on cognitive proxies to observe one's adaptability to the environment. For example, we have specialized learning systems that allow us to compute a kinship index, a measure of relatedness, to avoid incest.

In chapter 5, Boyer examines cognitive capacities involved in cooperation and fairness. Cooperation relies on cognitive capacities to keep track of previous social interactions with different partners for future reference. Such cognitive capacities enable people to remember partners who make fair deals for future reference as well as noncooperators for the purpose of inflicting punishment. In addition, these cognitive systems provide intuitive understanding of fairness, justice, and distribution, which shape people's attitudes and behaviors. Chapter 6 then addresses how people evolved to live in societies without fully understanding the underlying mechanisms of society. Boyer borrows the term "folk society" and expands it to describe the layperson's understanding of how societies work, what constitutes societies, and how these components are related.

The underlying assumption of Boyer's argument is that the human mind is "an efficient learning machine" (p. 67) that is capable of detecting useful information in the environment. Following the framework of the evolutionary theory, Boyer assumes that the human mind is functional and adaptive to enhance fitness. However, Boyer often encountered evidence that suggested otherwise. For example, people readily change their opinion to conform to the group as seen in Asch's experiment. Or, people's memory is malleable, fallible, and easily altered. Thus, Boyer presents selective data to justify his arguments. For example, to provide evidence that the human is not gullible, he provides an example of repressed memory and comments that "they did not show that people's memory was easy to fool—quite the opposite" (p. 73). However, research in cognitive psychology has provided compelling evidence showing that human cognitive function is far from being perfect and is susceptible to errors and failures in various stages of information processing—from perception to memory. For example, there is extensive evidence suggesting that our sensory and perceptual systems are highly susceptible to misperception, measurement errors, or visual illusions.[1] In fact, perceptual illusion occurs so frequently that it has been construed as an unreliable source for knowledge by itself.[2] Other troubling research suggests that our attention system has such limited capacity that we have to pay attention to some aspects of stimuli or environment and ignore or exclude others—termed selective attention.[3] Limited attentional capacity constrains our ability to perceive objects, stimuli, or changes occurring in environments.

Furthermore, a wealth of evidence in memory research suggests that human memories are easily altered, distorted, or reconstructed by misinformation, beliefs, moral concerns, and stereotypes.[4] The fragility of memory is well illustrated in the misinformation effect, which refers to the phenomenon that exposure to misleading information after an event distorts and changes how an eyewitness describes the event later.[5] Moreover, it is possible to suggest or implant an entirely false memory that had never happened before.[6] The prevalence of memory failure or distortion has been widely recognized and well documented by prominent memory researchers. For example, Daniel Schacter, a famous memory researcher at Harvard University, identified and described common "sins" of memory.[7]

Boyer made significant efforts to justify seemingly dysfunctional cognitive systems by presenting their roles in satisfying another evolutionary goal. For example, Boyer suggests that one's susceptibility to information that feeds "junk culture" can be attributed to negativity bias, which describes one's tendency to readily receive and accept negative information. Negative bias can be explained by a built-in threat response system that operates to detect potential threat. Indeed, negative bias can be adaptive from the evolutionary perspective because accepting precautionary advice against potential danger allows one to identify the source of danger without extensive, yet potentially costly, processes of testing. In particular, when threat information is moralized, it can serve an important role in recruiting in-group members by motivating and persuading people to participate in an action to achieve a collective goal. As such, information that feeds "junk culture" can be functional and adaptive to the social world, though it may not always be philosophically or scientifically true. As a result, human minds are susceptive to such information, thereby enhancing fitness. However, cognitive models of psychopathology posit that negativity bias in information processing may play a critical role in the etiology and maintenance of a wide range of anxiety disorders and depression.[8] It has been well documented that people with anxiety disorders demonstrate prioritized attentional processing favoring emotionally negative information; similarly, people with depression demonstrate memory bias favoring emotionally negative events. Thus, what is defined as functional can be a source of problems that produces aversive results.

On the other hand, Christian worldview has provided some explanations and implications for cognitive

limitations and constraints. God made humankind in His image with an ability to learn and to think. In fact, humankind was created with the superior intellectual capacity to perceive and pay attention, think creatively and logically, use complex language, and govern the physical world.[9] Furthermore, humankind was capable of moral reasoning—an ability to determine right from wrong—by God's moral standard.[10] Many Christian traditions emphasize the importance of human cognition (mind) in forming and developing the Christian faith. However, the Fall has brought devastating results on the human mind. The "total depravity" of man means that every part of the human constitution, including human mind, has been corrupted. Scripture depicts the human mind as being "darkened": our thinking becomes "futile" and we become hostile to God and his law. For instance, Mark 8:8 ("You have eyes—can't you see? You have ears—can't you hear? Don't you remember anything at all?," from New Living Translation) truly echoes cognitive limitations that we have. Indeed, a wealth of research in cognitive psychology has provided empirical evidence of functional difficulties and challenges in human cognition.

Such cognitive constraints and limitations significantly interfere with our ability to gain knowledge about the world and may pose serious challenges to psychological and social function. General revelation refers to the knowledge of God's existence, nature, and moral law through creation, which is bestowed upon every person.[11] However, limited and distorted cognitive capacity prevents people from correctly sensing and interpreting natural laws. For example, Einstein's groundbreaking work illuminated that time is experienced relatively, and also that time and space depend on each other.[12] However, to this date, we tend to consider space as being immutable and independent from time. As such, we have limited ability to perceive and understand natural law and God himself revealed in nature. Similarly, limited cognitive capacity sometimes hinders our understanding of God revealed in specific revelation. Specific revelation refers to God's Word, including prophecy, scripture, and the direct communication with the Holy Spirit, given to specific people.[13] Challenges in specific revelation may occur because of cognitive constraints imposed on hermeneutics and exegesis of scripture. For example, people, even theologians, find it difficult to conceptualize the role that human free will plays in the context of traditional predestination within Calvinist theology.[14] In an attempt to interpret and understand difficult concepts, people may rely on their intuition, presuppositions, and prior knowledge to make sense of apparently conflicting concepts, thereby turning exegesis into eisegesis. This may explain people's confusion of theological concepts, which confusion is observed in "theological correctness" (p. 107).

Although sin has seriously constrained and distorted cognitive function, it did not irreplaceably destroy one's capacity to exercise cognitive function and to grasp truth. Humankind in the fallen condition is capable of understanding some truth and processing information from the external world. In fact, people are capable of utilizing and processing information to engage in effective social behaviors. Some people have high intelligence and superior reasoning in that they are capable of understanding ideas and theories and making incredible discoveries and inventions.[15] I enthusiastically support Boyer's idea about the importance of cognitive systems in various social behaviors and their vital role in social function. The cognitive systems are adaptive and functional to a certain extent. However, at the same time, I humbly acknowledge that our limited cognitive capacity misguides psychological processes and poorly directs social behaviors; these unfortunate results contribute to the various individual and societal problems we encounter.

Notes

[1] E. B. Goldstein, *Cognitive Psychology: Connecting Mind, Research, and Everyday Experience,* 3rd ed. (Belmont, CA: Wadsworth, Cengage Learning, 2011); and R. L. Gregory, "Knowledge in Perception and Illusion," *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences* 352, no. 1358 (1997): 1121–27.

[2] D. M. McBride, *The Process of Research in Psychology,* 2nd ed. (Thousand Oaks, CA: Sage Publications, 2013).

[3] Goldstein, *Cognitive Psychology.*

[4] For reviews, see D. Davis and E. F. Loftus, "Internal and External Sources of Misinformation in Adult Witness Memory," in *The Handbook of Eyewitness Psychology: Volume 1: Memory for Events*, ed. M. P. Toglia et al. (Mahwah, NJ: Erlbaum, 2007), 195–237; E. R. Hirt et al., "Expectancies and Memory: Inferring the Past from What Must Have Been," in *How Expectancies Shape Experience*, ed. I. Kirsch (Washington, DC: American Psychological Association, 1999), 93–124; C. N. Macrae, A. B. Milne, and G. V. Bodenhausen, "Stereotypes as Energy Saving Devices: A Peek inside the Cognitive Toolbox," *Journal of Personality and Social Psychology* 66 (1994): 37–47; D. A. Pizarro et al., "Ripple Effects in Memory: Judgments of Moral Blame Can Distort Memory for Events," *Memory and Cognition* 34, no. 3 (2006): 550–55; H. L. Roediger, "Memory Illusions," *Journal of Memory and Language* 35 (1996): 76–100; M. Ross, "Relation of Implicit Theories to the Construction of Personal Histories," *Psychological Review* 96, no. 2 (1989): 341–57.

[5] Goldstein, *Cognitive Psychology.*

[6] E. F. Loftus, "Memories of Things Unseen," *Current Directions in Psychological Science* 13, no. 4 (2004): 145–47.

[7] D. L. Schacter, *The Seven Sins of Memory: How the Mind Forgets and Remembers* (New York: Houghton Mifflin Harcourt, 2002).

[8] See C. M. MacLeod et al., "The Causal Status of Anxiety-Linked Attentional and Interpretive Bias," in *Cognition, Emotion and Psychopathology: Theoretical, Empirical and Clinical Directions*, ed. J. Yiend (Cambridge, UK: Cambridge University Press, 2004), 172–89; for a review, see E. J. Wilson et al., "The Causal Role of Interpretive Bias in Anxiety Reactivity," *Journal of Abnormal Psychology* 115 (2006): 103–11.

Book Reviews

[9]W. A. Grudem, *Systematic Theology: An Introduction to Biblical Doctrine* (Grand Rapids, MI: Zondervan, 1994).

[10]Ibid.

[11]Ibid.; N. D. Holsteen and M. J. Svigel, *Exploring Christian Theology, Vol. 1: Creation, Fall, and Salvation* (Grand Rapids, MI: Baker Publishing Group, 2014).

[12]B. Greene, *The Fabric of the Cosmos: Space, Time, and the Texture of Reality* (New York: Vintage, 2007).

[13]Grudem, *Systematic Theology*; and Holsteen and Svigel, *Exploring Christian Theology*.

[14]J. Slone, *Theological Incorrectness: Why Religious People Believe What They Shouldn't* (New York: Oxford University Press, 2007).

[15]Grudem, *Systematic Theology*.

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TECHNOLOGY

MODERN TECHNOLOGY AND THE HUMAN FUTURE: A Christian Appraisal by Craig M. Gay. Downers Grove, IL: InterVarsity Press, 2018. 233 pages plus preface and acknowledgments; includes epilogue and author, subject, and scripture indices. Paperback; $22.50. ISBN: 9780830852208.

If someone asked me what I regard as the seminal works of the last century or so that critique technology and technological thinking, I would point that person to the works of Max Weber, Lewis Mumford, Jacques Ellul, and Joseph Weizenbaum. But if they asked me to point them to a book that made the best thinking about technology accessible to people who are broadly educated and eager to learn but who are not specialists, I would point them to Craig Gay's book, *Modern Technology and the Human Future*.

Gay has written a very helpful book. It is carefully thought out, well organized, thorough, deals with substantive and critically important ideas—and it is readable!

Gay begins by arguing that there are serious problems with the direction in which modern technological development is heading; he does this by treating a number of important and comprehensible examples. He then analyzes the economic dynamics that drive such development and follows with a clear analysis of the historical and philosophical roots of that development, most notably the mechanistic model of the universe commonly associated with Descartes. He then steps aside for a chapter to discuss the Christian view of human nature, especially "embodied human existence," through the lens of the creation-fall-redemption-consummation model. The argument culminates with a discussion of what Christians can reasonably do in the face of this situation. He concludes with some personal reflections on technology and employs the concept of the eucharist to tie all of his threads together in a coherent and compelling way.

Gay's book is a tale of two views of the universe: as fundamentally personal or impersonal. From a Christian perspective, everything in the universe is created by a personal God. Thus, it is endowed with qualities given by a person, such as meaning, purpose, and value. It is undergirded by a transcendent moral system. Human beings have a purpose and direction, to be shaped into Christlikeness, and this provides a basis for evaluating the worth of all human endeavors. Our bodies are not prisons for our minds, but temples worthy of honor. Our relationship with the created world ought to be characterized by appreciation and, when appropriate, love.

If, however, the universe is an impersonal machine, governed solely by natural laws with no transcendent meaning, humans are free to master those laws and shape nature to their own ends. Nature's only purposes are those that people give it. Our culture seems to have adopted the perspective of an impersonal universe and the consequences are extensive. There are surface problems that flow from this perspective and that have been widely discussed; for example, algorithms that have replaced human judgment in harmful ways, narrow specialization, the confusion of means and ends, and the loss of skills. But there are deeper problems. Gay argues that automated machine technology is pushing society and culture away from ordinary embodied human existence at considerable speed and we are becoming more machine-like. Furthermore, technology seems to be interfering with our ability to enter into "I-Thou" relationships. In short, given its current trajectory, modern automatic machine technology is more likely to detract from our ordinary embodied experience of the world than it is to enhance it.

The author is no technophobe. Following the last chapter, he includes a personal conclusion in which he discusses his enjoyment of high-performance bicycle technology. However, he identifies a significant problem with the direction contemporary technology is heading and asks why we are so unconcerned. His answer is that western culture has thoroughly assimilated the mechanistic worldview.

What can Christians do to respond to a culture that, in its understanding of the nature of the universe, is antithetical to the personal perspective that Christian belief affirms? We intuitively recognize that aspects of our lives—friendship, marriage, family—are not to be surrendered to rationalized techniques based on productivity, efficiency, cost/benefit analysis. Thus, Gay urges taking an inventory of the physical places