to do in this book what they [Ricketts and Steinbeck] were trying to do—put it all together, the personal, the historical, the scientific" (p. 7). This is an appropriate approach to a defense of citizen science, which combines the layperson's love of nature with the desire to do something to make a difference, and it results in valuable contributions to professional scientific efforts.

Hannibal weaves these various components together smoothly and in an appealing way. She points out that crucial themes from *The Grapes of Wrath* continue to resonate today, from the perspective of land use and climate change to the consequences of human dissociation from the land, which leads to destruction of that land and then to the destruction of humanity itself. As the subtitle indicates, extinction is a recurring theme of her book. Disappearing species drive the urgency behind her calls for cooperation between nonscientists and scientists. She details the way citizen science efforts bridge academic and applied sciences and the growing validation by academic scientists of the value of data acquired by nonprofessionals. It is becoming more and more widely recognized that "citizen science monitoring … is probably the only tool that can really scale to aggregate big enough numbers of local observations to create a picture of global consequence" (p. 59).

A significant point Hannibal makes in support of citizen science is that it is a way to cultivate a scientifically oriented society—something that is desperately needed. Understanding the ability of species to change in response to climate conditions requires interdisciplinary scientists and huge networks of citizen scientists (p. 287). One of many scientists Hannibal interviewed, Julia Parrish, works with between 750 and 800 volunteers monitoring beaches from Northern California to Alaska. She comments,

> Scientists alone can't begin to document what's normal, let alone how fast things are changing. We need a willing army to make that happen. In short, we need citizens—the locals who watch, and know, and love their backyards, their environments. (p. 80)

The book includes some chapters that become overly long and seem to veer away from the chapter's theme. Some readers may find the recurring personal account of the author's experiencing the death of her father tiresome—but its link to the disappearance of species and the fragile nature of life is both relevant and sad. Any reader who is interested in the natural history of California would find *Citizen Science* intriguing. As well, academics who question the value of data acquired by nonprofessional scientists would be wise to read the perspectives of scientists that Hannibal presents in order to understand the

significance of citizen scientists' contributions. This book would also be of great benefit to anyone who wants to know more about the burgeoning approach to "doing science" that citizen science has become.

Moreover, from a Christian reader's perspective, the biblical mandate for stewardship of God's invaluable creation supports the entire concept of citizen participation in the scientific effort splendidly. We who claim relationship with the Creator can joyfully support scrutiny of the creation; it yields not only data but opportunity to marvel.

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TECHNOLOGY

TEN ARGUMENTS FOR DELETING YOUR SOCIAL MEDIA ACCOUNTS RIGHT NOW by Jaron Lanier. New York: Henry Holt, 2018. 160 pages. Hardcover; $18.00. ISBN: 9781250196682.

As one who rarely uses social media, I found it easy to agree with Jaron Lanier. As stated in the title of the book, Lanier offers ten arguments as to why readers would be better off not using social media, particularly social media services provided by Facebook and Google.

A problem Lanier introduces early in his book is that social media automatically optimize for attention, and this usually means presenting negative information. This can come in the form of negative news feeds or encouraging negative, argumentative, and unhelpful discussions. This is not necessarily intentional from the makers of social media platforms; the process of automatically testing users with small random changes leads to promoting negative content in social media over positive content. The purpose of this automation is to make users available and susceptible to advertisers, who are the actual customers for social media companies. Additionally, users may unknowingly interact with automated users and consequently adopt the viewpoint selected by advertisers. Similarly, social media can initially be helpful with early adopters with impressive results, but it subsequently lends itself to trolls taking over after the human users have been sufficiently modeled.

As mentioned in his title, Lanier's proposed solution is to encourage widespread deletion of social media accounts. He specifies that it is not the social media platform itself that is the problem, but the application of current algorithms that ruin the platform. At the end of his eighth argument, he suggests the need for users to pay for social media platforms, own their

data, and set the price for using their data. Earning money on valuable data should be normal and easy for the user. The hope is to use and reward social media platforms that promote positive interactions, but he feels that this cannot happen with the current methods of the dominant players, particularly when advertisers are the customers. Consequently, mass deletion of social media accounts is the necessary next step.

Overall, Lanier's arguments are timely for users concerned with privacy, personal choice, and advertisers' influence over their minds and values. Each argument in the book is supported with references, although I would like to see more references to support his eighth argument (although this chapter relies on his previous work, and presumably on the research presented there, it does not stand on its own when compared to other chapters in the present book).

While not written from a Christian perspective, I find it easy to agree with a writer who places people over profits and machines. Lanier presents the costs of using such social media platforms, such as creating people who act less humanely, behave more troll-like, are sadder, and have less empathy for others. The benefits go to advertisers who pay to manipulate users for profit or political benefit. Additionally, Lanier presents arguments that long-term use of social media decreases the user's ability to recognize truth, since platforms remove the context of facts (except for podcasts at the moment).

Consequently, Lanier unwittingly provides an argument that aligns with the Bible's instructions in 2 Corinthians 10:5, where Paul tells his readers to take captive every thought. Similarly, I found that his arguments agree with Romans 12:2, where readers are instructed to renew their minds to test and approve of God's will. It seems that social media have been competing for the attention of our hearts and minds, with purposes at odds with biblical instruction.

Argument ten relates most directly to spirituality and religion, in that he states "SOCIAL MEDIA HATES YOUR SOUL." While not favorable toward religion, this argument highlights parallels between religion and social media. For example, Larnier argues that social media platforms erode users' free will and transfer decision-making power to companies; he compares this to how (he assumes) the church makes decisions for its constituents. Another example is how social media use group mentality thinking to encourage users to treat others badly, similar to how he sees religious conflicts engaging people more

intensely. Larnier sees his suggestions to reject the current version of social media platforms, while not rejecting the core of social media, as similar to the Protestant Reformation during which Protestants rejected harmful practices such as indulgences. Larnier also sees social media as defining truth for its users by selecting the context for facts. He aligns this with the church defining truth within a religious framework, including a reference that some religious people still think the sun orbits the earth. Like religious frameworks, social media provide ultimate purposes for its users, although he mentions that they are poor choices for ultimate purposes, stating that the purposes of Google and Facebook are to organize information and give users a sense of purpose and community.

The part I appreciated from argument ten was the suggestion that people are using social media platforms in a spiritual and religious way. I hope this encourages readers to reflect on the use of such platforms in their lives, so that they can be empowered to use them as a tool, rather than the other way around. As for the church, argument ten observes that social media compete to define truth and purpose for people. This point is helpful as it stands, but the negative portrayal of religion and the church is not. While I realize that the church has issues to work on, it was grating that every issue of comparison presented religion in a negative light without acknowledging a valuable role for the church in society. One gets the impression that Lanier wants people to quit both their social media accounts and their church.

One could do without some of the colorful language used in parts of the book, but the language does not diminish Lanier's arguments. The book convincingly warns its readers of the destructive effects of social media on individuals and society. It is timely for both thought and action.

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EVERYBODY LIES: Big Data, New Data, and What the Internet Can Tell Us about Who We Really Are by Seth Stephens-Davidowitz. New York: Dey Street Books, 2018. 352 pages. Paperback; $16.99. ISBN: 9780062390868.

Everybody Lies, as the subtitle suggests, is Seth Stephens-Davidowitz's book about "Big Data" and what it tells us about ourselves. He is quite explicit that he is inspired by *Freakonomics* and hopes to apply its irreverent but quantitative approach to new kinds of data that have been enabled by the internet.