and Tan are careful to acknowledge that therapy rarely results in significant change in a person's sexual orientation or attractions. They focus instead on the importance of recognizing clients' social and cultural contexts, and helping them toward an integrated identity, one that takes into account the clients' beliefs, values, context, and desires.

While there is much to applaud in Yarhouse and Tan's deft exploration of Christian perspectives on sexuality and sex therapy, they clearly evince a view of Christian sexual ethics that is pretty standard evangelical American fare: Sexual expression is ideally exclusive to those in heterosexual marriage. For example, their discussion of sexual identity quite clearly implies that sexual attractions to any but the "other" sex are problematic to committed Christians and must be dealt with—not, to be sure, through enforced treatment, and not without deep compassion. While they encourage therapists to be open to the possibility that their clients may choose to adopt a "gay identity," the main message suggests that, for the committed Christian, there are better alternatives. Though I deeply appreciate their nuancing of the issues involved, I wish they had extended their focus slightly to include the communities within which people struggle with questions of sexuality. There is little here that acknowledges the profound anguish, heartache, and family struggles that are often associated with a Christian daughter or son identifying as gay. All the attention is on the person struggling with their sexual desires, when there may also be an important place for Christian therapists to speak to families and communities whose fears, attitudes, and beliefs often contribute significantly to their clients' pain.

This focus on the individual or couple is a general weakness of the book. While therapists' and pastors' primary concern is for the person or couple seeking their support, these clients live in a context, as Yarhouse and Tan repeatedly acknowledge. Yet nowhere in the book is there much suggestion that perhaps the context, not the client, is the problem. I was also disappointed that the foundational material in the first four and the last chapters did not make reference to some truly excellent work by scholars such as Margaret Farley or Lisa Sowle Cahill. While it is impossible to cite everyone who has weighed in on these topics, a broader range of perspectives would have deepened this material, and provided some food for thought regarding the possible limits of the "standard" evangelical view of sexuality.

Overall, this is a fairly accessible book that would be of use to Christian pastors and therapists who occasionally deal with clients struggling with sexuality. For those interested in science and Christian faith discussions and their implications for the "culture wars" around sexuality, this book is worth considering. The thought exercises should stimulate critical engagement with the issues and help readers to thoughtfully digest other excellent books on these topics.

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Religion & Science

SEX ITSELF: The Search for Male and Female in the Human Genome by Sarah S. Richardson. Chicago, IL: The University of Chicago Press, 2013. 320 pages. Hardcover; $45.00. ISBN: 9780226084688.

It seems that humans have an intrinsic compulsion to classify elements in God's creation: to express a taxonomic urge. Perhaps this urge is a result of God instructing humans to name each living creature from the beginning (Genesis 2:19–20), or perhaps it is a natural reaction to the overwhelming diversity in creation. Regardless of the origin or intent, the taxonomic urge includes classifying sex and gender. Sociologists attempt to determine the influence these two components have upon individuals in society. Psychologists attempt to assess differences in male and female brains. Biologists attempt to describe the molecular mechanisms involved in forming males and females.

Predictably, the topics of sex and gender have not escaped the church. Many of the major controversies in the Christian community circle around these topics, perhaps more now than ever before. Many denominations continue a multi-decade conversation wrestling with the implications of sex and gender for ordination and sexual orientation. Heading into these conversations, it is important to realize that even the scientific methods of defining the mechanisms of how we become male or female are blurred, perhaps more than the general population realizes. Our attempts have tended to work toward reducing complex issues into overly simplistic categorizations. In the book, *Sex Itself: The Search for Male and Female in the Human Genome*, Sarah Richardson highlights the biases and inadequacies that have influenced the formation of what it means to be male and female—even at a genetic level.

Trained as a developmental biologist, I began reading Richardson's book hoping for an in-depth examination of the genetic cases that defy current bifurcated gender categories. Instead, however, Richardson succeeds in accomplishing something different. Utilizing reviews of historical, philosophical, and gender studies, she brings to the forefront of the discussion the evidence that science is not immune to the influences of culture and

society. She boldly argues that females have been portrayed as secondary to males, even in scientific attempts to elucidate the biochemical mechanisms which define the development of females from males.

She points out that the genomic approach of studying the sex chromosomes is too limited and riddled with gender politics. Such gender politics permeates the words we use to describe genetic pathways that cause differentiation of males and females. Terms such as dominant and default state have a hierarchical ring. Despite much talk about gender, "discourses around gender, discourses often framed by the expectation that the facts of biology would help to settle the matter of the hierarchy of the sexes once and for all" (p. 71), Richardson gives multiple examples showing that science, unfortunately, has had a hand in enabling negative gender stereotypes.

Richardson provides a helpful review and critique of how the approaches to assessing the nature of gender bifurcation among humans are riddled with biases. Specifically, she addresses several major areas including whether the X and Y chromosomes are appropriately named "sex chromosomes," the claim that Y chromosome is shrinking, and that from a genomic perspective, men and women are not that different—certainly not different enough to consider each sex as having their own distinct genome.

Sex Itself is a great primer to begin examining our history and current academic approaches pertaining to defining sex and gender from a genomic perspective through a historical and philosophical lens. To be aware that we explore genomics and molecular mechanisms of development with a bias is only the first step, however. By placing humans into a dichotomy that is attempting to explain a spectrum of sex or trying to undermine one end of the spectrum over the other, we do all a disservice. This book leaves us with a challenge to critique how current paradigms fall short.

Whether an individual is perceived to be male or female impacts what one experiences from a physical, reproductive, psychological, and social perspective. Our gender labels influence who we perceive ourselves to be and can influence the limits and goals we set for ourselves. Should Christians then focus our analytical abilities on the mechanisms that generate phenotypic differences in sex? Should we carefully examine whether there are distinct God-intended roles for men and women? Are we doing a disservice to ourselves and future generations by continually bifurcating ourselves into one of two categories? If these questions intrigue you, you should read *Sex Itself*.

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TECHNOLOGY

BIG DATA: A Revolution That Will Transform How We Live, Work, and Think by Viktor Mayer-Schönberger and Kenneth Cukier. Boston, MA: Eamon Dolan/Mariner Books, 2014. 252 pages. Paperback; $15.95. ISBN: 9780544227750.

The data trails we create do not disappear. They also do not remain dormant. Instead, they are aggregated and harvested to serve multiple purposes, many far different from the reason the data was first produced. This aggregated data can be used to predict flu outbreaks, predict who might be a potential terrorist, or locate city dwellings that have been illegally subdivided into multiple units. These applications and many more are possible due to the massive amount of data that exists. The culture and techniques that have recently appeared in this context are often called *big data*.

The book *Big Data*, written by Viktor Mayer-Schönberger (professor of Internet Governance and Regulation at Oxford University) and Kenneth Cukier (data editor of *The Economist*), is intended as an introduction for a general audience. It includes many interesting examples of how big data techniques are being used.

Rather than provide a precise definition of big data, the authors work from a more general statement:

> Big data refers to things one can do at a large scale that cannot be done at a smaller one, to extract new insights or create new forms of value, in ways that change markets, organizations, the relationship between citizens and governments, and more. (p. 6)

They assert that big data is making fundamental changes in how we operate. Three changes are emphasized.

First, in the past, data was difficult or expensive to collect. Consequently, we used samples and sophisticated statistical analysis to reach meaningful conclusions. With big data, we are able to use data sets that approach comprehensive collections. For example, in 2004, Walmart used data-mining techniques to examine their old sales receipts for interesting correlations. They discovered that sales of strawberry pop-tarts increased seven-fold shortly before a hurricane. This discovery was possible because they looked for correlations in massive amounts of data with no preconception of what they were seeking.

Second, in the past, data needed to be collected carefully in order to minimize bias and increase the accuracy of the predictions. Big data can tolerate imprecise data and also data that are stored in different formats or using different units. The errors tend to neutralize each