

reading of scripture. His conclusions will satisfy some readers—and dissatisfy others—but *2084* will certainly inform them of AI and its importance. As believers ponder the future, by God’s grace the church can remain true to its mission, finding answers to tough questions by searching the scriptures in light of the doctrines they reveal.

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HUMBLE PI: When Math Goes Wrong in the Real World by Matt Parker. New York: Riverhead Books, 2020. 336 pages. Hardcover; \$27.00. ISBN: 9780593084687.

Humble Pi delivers a veritable potpourri of mathematical mistakes in the real world, as the title suggests. Consequently, the book may be of interest to a wide variety of readers. Mathematics educators who are looking for reasons why their students should pay attention in class will find plenty of examples to convince even the most skeptical student that mathematical mistakes can have real-world consequences. Meanwhile, readers who struggled in math class may be happy to see that even the supposed experts suffer the consequences of their own miscalculations. While the book is predominantly written in a light-hearted tone that makes it relatively easy to read for a broad audience, it occasionally is somber when real lives are put in danger due to the math going wrong.

The author, Matt Parker, is likely more well known as a YouTube mathematician. His channel “Stand-up Maths” has half a million subscribers and sixty million views. Parker’s attempt to channel his high energy, “math is fun” persona into the written word is a challenging task, but he mostly delivers. For example, the page numbers count down until they reach 0, causing an error so the next page is numbered 4,294,967,295. This seemingly random large number happens to be $2^{32} - 1$; reading the rest of the book will explain why. The chapters count up from 0, except for a small chapter 9.49 which follows the chapter on rounding. Parker adds levity at the meta level as well as in the writing itself which builds on itself effectively. For this reason, readers who already are familiar with Parker’s work on YouTube will likely catch some extra inside jokes. However, to be clear, the book is not simply fan fiction; it is a well-researched and thorough account of mathematical mistakes in various contexts and should appeal to a wide audience.

The content of the book is organized into chapters based on the types of mistakes: losing track of time, counting errors, geometry gone awry, unit conversions, and statistics, to name a few. If one chapter fails to capture interest, the next one delivers something fresh. While this feature is mostly true, it fails in one way. So many of the mistakes come down to computer programming errors. At the core, there is a mathematical idea

at play, but the mistake comes from improperly coding that idea into a computer. The author did research a rich set of mathematical mistakes, but often it was not the mathematics that failed but the programming. As a mathematician, I was hoping for more mistakes that felt like mathematics itself going wrong. Yet I suspect that for most readers this is a distinction without a difference.

While the author is not writing explicitly from a Christian perspective, that does not mean that the book is therefore neutral or without perspective. Parker finds a deep joy in the doing of mathematics, a latent aspect of creation awaiting cultivation; he may not express it this way, but the joy is unmistakable. Many of the errors depicted in the book have led to the loss, or near loss, of human lives, sometimes in the hundreds. In a way, this book deeply values life, and one possible outcome would be that people could be more aware of mitigating such errors. In the final chapter, titled “So, What Have We Learned from Our Mistakes?,” Parker writes:

I’ve done a lot of research from accident-investigation reports that were publicly released, but that generally happens only when there is a very obvious disaster. Many more, quiet mathematical mistakes are probably swept under the rug. Because we all make mistakes. Relentlessly. And that is nothing to be feared. Many people I speak to say that, when they were at school, they were put off mathematics because they simply didn’t get it. But half the challenge of learning math is accepting that you may not be naturally good at it, but if you put the effort in, you can learn it. As far as I’m aware, the only quote from me that has been made into a poster by teachers and put up in the classrooms is: “Mathematicians aren’t people who find math easy; they’re people who enjoy how hard it is.” (p. 7)

This is a book which outlines mathematical mistakes in the hope that it could prevent some future mistakes; this hope is laudable, and it provides some levity along the way, which is sorely needed in 2020. However, the example of the UK government refusing to change the picture of an incorrect soccer ball on their signs suggests that many mathematical mistakes are likely to be commonplace.

Finally, it should be noted that the book is not only about mistakes, it also provides lots of “Wow, I didn’t know that!” moments. Did you know that a year of “seasons” and a year of the earth’s orbit are not the same thing? The book is peppered with vignettes such as this that keep the reader wanting more. In the end, the book is entertaining, includes a lot of fresh examples of math in the real world that STEM educators might find helpful, and is written for a broad audience. The fact that mathematics goes wrong in the modern world mostly in connection with computers is important to note; that there are so many ways for it to go wrong is fascinating.

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