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A Personal and Multicultural Journey Through the
World of Games (With a Little Math)

OR

Book Review: *Around the World in Eighty Games*,
by Marcus Du Sautoy

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Synopsis

Author and number theorist Marcus Du Sautoy has written a book about games, including a light dose of mathematics. In it, he journeys through far more than (his choice of) eighty of “the world’s greatest games”, laying out a charming voyage through many lands. Despite some reservations, this reviewer finds that *Around the World in Eighty Games* is well-written and quite fascinating, largely due to its idiosyncratic, personal nature.

Around the World in Eighty Games: From Tarot to Tic-Tac-Toe, Catan to Chutes and Ladders, a Mathematician Unlocks the Secrets of the World’s Greatest Games. By Marcus Du Sautoy, Basic Books, New York, 2023. (Hardcover US\$30.00, ISBN: 9781541601284. 384 pages.)

We recently hired a wonderful new colleague who is, like me, more than slightly addicted to games of many kinds. What better way, we thought, to celebrate grading being done than with a two-family game of *Ticket to Ride* (game # 57 of the book under review)?

One colleague (a delightful and dedicated mathematician and teacher) might have disagreed. He was perplexed that in our search, nearly every candidate

mentioned hobbyist gaming of some kind as an interest. If you're not a game player, you might be able to relate to his retort: "Don't people read books or watch sports any more?"

Yes, but they also play games! Anecdotally, math folks of many ages pick this as a relaxation of choice. Social gatherings at conferences always seem to have *Fluxx* or *Hanabi* on tap, and my research collaborators and I often have games in the wings when we meet. One well-known mathematician organized *Backgammon* (game # 1) sessions at the Joint Mathematics Meetings. *Chess* (game # 11) of many varieties was a fixture in my graduate program, and my own students keep the campus *Go* (game # 22) paraphernalia in the math library.

Math and gaming can get serious. On the one hand, it's no surprise that the "recreational mathematics" sessions at the 2024 Joint Meetings include many talks on games, including a report by eminent probabilist Persi Diaconis on *Solitaire* concluding that we are "not even close" to figuring out the chances of winning. But there is also a session on "decisions, elections, and games" featuring topics including non-cooperative game theory (game # 21 is *The Prisoner's Dilemma*). Combinatorial games have a special connection to many of the far-more-than-eighty games in this book, and the "strategy-stealing" proof that a winning strategy exists for the first player is duly included for *Chomp*. (*Nim* is game # 19.) Readers who have dealt with combinatorics or finite geometries may know that they are exemplified in *Spot It!* (*Dobble* outside the USA, game # 75) and *SET* (game # 76).

This mutual interest is not new. Emanuel Lasker might be the best-known mathematical gamer, since his fame for introducing primary ideals is eclipsed by his long run as chess world champion. *Dots and Boxes* (game # 75) was invented by the same Eduard Lucas of *Tower of Hanoi* fame (and the Lucas-Lehmer Mersenne primality test). Pascal and Fermat have long since been lionized for developing a first foundation for probability in their analysis of games of chance, though Cardano started along this path a century earlier, no doubt influenced by his own compulsive gambling.

Going back even further, this book's description of chess includes the familiar story of the exponential (doubling) growth of grains of rice placed on the board, first reported by Arab historian Al-Masudi. And finally, the origin of the dodecahedron (and, the book implies, possible inspiration for Euclid's predecessors' proofs on Platonic solids in Book XIII of the *Elements*?) is not

in pure Greek geometry, but in Etruscan zodiacal dice. Maybe that's not so far from using the icosahedron as a randomizer in *Dungeons and Dragons* (game # 35)!

With all this in mind, it's more than appropriate that author and number theorist Marcus Du Sautoy would write a book about games, including a light dose of mathematics. The evident joy he finds in a huge variety of very social (and other) games is a good corrective to any public thought that games and math connect only in MIT students beating Vegas, or mathletes playing chess between tests. And Du Sautoy, the Simonyi Professor for the Public Understanding of Science at Oxford, is certainly obsessed with games.

He journeys through far more than (his choice of) eighty of "the world's greatest games", laying out a charming voyage through many lands, loosely inspired by the journey of Phileas Fogg (expect many allusions to Verne's novel). From racing games in the ancient Fertile Crescent, to the many *Mancala* variants in Africa, to betting games in South America, we have a more than representative sample of interesting games from around the world. Note I say "representative;" Du Sautoy is the first to say he does "not intend [the book] to be an encyclopedia of games." Nonetheless, he chronicles an impressive number of games from outside of Europe, North America, India, and China, including stops in New Zealand for *Mu Torere* (game # 36), Brazil for *Adugo* (game # 46), and many *Nine Men's Morris*-type games from Africa (game # 67, though a similar game was known to the Romans and is popular in many parts of the world). An ease at upending gaming colonialism is a real strength of the book. Did you know that a possible predecessor to the predecessor (Lizzie Magie's *Landlord's Game*) to *Monopoly* (game # 53) was an Indigenous game called *Zohn Ahl*?

Similarly expansive is Du Sautoy's notion of what counts as a game. We also have computer games, a global litany of playing card games, collectable card games such as *Pokémon* (game # 34), the musical dice game attributed to Mozart (game # 43), and even a meditation on play in the animal kingdom (game # 8). Puzzles do not appear, but riddles do, as well as two completely fictional games, notably Hermann Hesse's *Glasperlenspiel* (game # 80).

The variety in both cases comes from the book's "very personal" (page 6) nature. Sometimes this is rewarding. The story of the Indian tabletop pool-like game *Carrom* (game # 12) is an example of the book at its best; we see how Carrom fits in the culture, the basics of how to play it, and what

makes it fun and enduring. There is intentional philosophizing; Du Sautoy's advice that "[y]ou cannot lose yourself forever in a game" is a good point to ponder in a day of intentionally addictive games on mobile devices (which he duly acknowledges). His internal dialogue with Wittgenstein over the nature of "game", with philosopher Bernard Suits's possible resolution (page 45) appropriately gets us thinking even deeper.

However, at least this reader finds the book to be just too personal. In telling his story about discovering each game, we hear how he just happened to be traveling in Kashgar, or Bedouin villages, or Japan, or New Zealand, for his job and then still found plenty of time to check out the local game culture. It's not clear to me how many readers will be able to identify with this globe-trotting lifestyle; this is no Fogg staying in London for years until suddenly embarking on the journey.

In another example, Du Sautoy describes a collaboration with several famous friends (including legendary game designer Reiner Knizia) on a math learning game site, *MangaHigh.com* (game # 36). Certainly "gamification" of learning is a big topic now, but we don't hear anything about similar initiatives like Keith Devlin's *Brainquake* or WeBWork's achievement packages (or even the hypersuccessful language app *Duolingo*). Every time the book veers from the games into travelogue or intimate insights into the Du Sautoy family, the harder it is to pay attention to the games. That's an author's prerogative, to be sure, but while Verne's Fogg is a foil, the author occasionally veers into being the main attraction here.

A more surprising shortcoming is that the amount of mathematical detail varies quite a bit. Discussions of nontransitive dice (page 240) and the math of *Catan* (game # 71) are aimed at the right level, as are the finite geometries in *Dobble/Spot It!* and *SET*. However, a full expansion of $(x + y)^{15}$ in a discussion of a movie in the *Pirates of the Caribbean* franchise (page 207) will only scare off casual readers, as will the attempt at explaining matrices for Markov chains (page 67). The game of group theory (page 265) will certainly only appeal to those well along their way to being mathematicians, but the previous examples won't satisfy that crowd.

Finally, Du Sautoy clearly loves a good story, but should distinguish speculation or opinion more. Did the rules of chess change as warfare changed (page 53) or is having codified rules, as in games, connected to a political movement beyond a "tyrant's whim" (page 40)? He's a bit cagey about this. Not cagey

at all is the suggestion that “Life has no meaning”, for which among several coping strategies might be “falsely manufactur[ing] meaning through ... religion,” and playing games. That would be a surprise to the large number of game-playing students I’ve had from all three Abrahamic faiths, who didn’t seem to find either of those aspects of their lives as coping with existential dread. When he repeats a canard about zero being banned as the number of the devil in High Middle Ages Europe (Phillip Nothaft debunks this in an article [3] in the *British Journal for the History of Mathematics*), we’ve strayed too far from our journey’s path.

Despite my reservations, I need to be clear that the book is mostly well-written and fascinating, largely due to this same idiosyncratic, personal nature. It also helps immensely that the engaging author is quite up-to-date; not only does ChatGPT show up, there is a whole section on *Wordle* (game # 55) and its successors.

Finding the right audience is going to be the trick. This book is far better at multicultural game history than [4] (one of Du Sautoy’s references, indeed), and it addresses colonialism far less depressingly than [2]—but it doesn’t intend to be systematic, so it can’t replace either of them. It isn’t as mathematical as [1] (or the many other game-related books published by AK Peters/CRC), but the eyes of the typical reader of [5] will probably glaze over at some of the math. And much as it seems to want to be, it’s also neither quite a true memoir, nor a scholarly investigation of why and how we game.

Perhaps the best way to read it is to play Du Sautoy’s bonus game, a game within the book itself. Just roll a die to determine the next chapter to read, and only read a few chapters at a time. Maybe share a different chapter with each of your friends to help determine your next gaming party option? A more casual, occasional reading might be the way for the sheer joy to keep coming through, while not being overburdened with the metaphysics. And that joy of discovery and play is, I am certain, what this book is most intended to bring forth. Play on!

References

- [1] Elwyn Berlekamp, John H. Conway, and Richard Guy, *Winning Ways for Your Mathematical Plays*, AK Peters, 2003.

- [2] Mary Flanagan and Mikael Jakobsson, *Playing Oppression*, MIT Press, 2023.
- [3] Philipp Nothaft, “Medieval Europe’s satanic ciphers: on the genesis of a modern myth,” *British Journal for the History of Mathematics*, Volume **35** Issue 2 (2020), pages 107–136. doi:[10.1080/26375451.2020.1726050](https://doi.org/10.1080/26375451.2020.1726050)
- [4] David Parlett, *The Oxford History of Board Games*, Oxford University Press, 1999.
- [5] James Wallis, *Everybody Wins: Four Decades of the Greatest Board Games Ever Made*, Aconyte, 2023.