

Book Review: Satan, Cantor and Infinity

by S. Parthasarathy - Wednesday, October 28, 2015

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Raymond Smullyan, the master story-teller, wears many feathers on his cap: mathematician, logician, concert pianist, stage magician, amateur astronomer, puzzle master, teacher. He often mixes his talents, and creates amazing books on logic and puzzles, which often call for profound reasoning and mathematical deduction. His book, *Satan, Cantor and Infinity: Mind-Boggling Puzzles* (published by Dover Recreational Math) is one such masterpiece.

In this book, Raymond Smullyan takes a puzzle-based perspective on the principles underlying the works of mathematician Georg Cantor, particularly on infinity. His fascinating riddles involve probability, certainty, time, and infinity, and they unfold amid a landscape populated by honorable knights, lying knaves, quick-witted robots, and other fanciful characters.

This 270+ pages tome, explains 25 puzzles, grouped into 7 parts. Each puzzle is as intriguing as the other, and demonstrates the inventive genius of the author. Using an imaginary sorcerer who is really a logician, Smullyan takes us on a tour of logic and mathematics, including Godel's famous theorem. Which brings us to the pioneering discoveries of Georg Cantor. Each puzzle is not linked to any other in the book, and so the reader may peruse the contents in any order.

I chose to read the last part of the book (part 6) which had a tantalizing title "A journey into infinity". This part carries a puzzle, or rather an introspection "What is infinity?" A very lucid conversation involving the Sorcerer, talks about infinity and the famous "Hilbert's hotel problem". This lead me to my favourite concept -- paradoxes. I also found in part 5 "The envelopes paradox". [I had written about this paradox, some time ago.](#)

The book has its fair share of puzzles involving truth-tellers (knights) and liars (knaves). It has therefore several interesting examples of the usage of Goodman's principle.

Smullyan not only unveils his puzzles in his own fascinating style. He also gives clues/solutions to most of his puzzles. But wait ! You need to ponder well, before you can grasp the puzzle or its solution (my experience).

Finally, this book is not for the mathematically weak-minded. A good knowledge of Cantor's set theory, and the works of Zermelo, Fraenkel, Russel, Godel, and Lewis Carroll, would make reading this book, a lot more enjoyable. My closing remark would be that rather than using this book for entertainment, it can also be a valuable and innovative tool for understanding mathematics and logic.

Smullyan beautifully sums up his thoughts as follows: *The moral of the story is that even fallen angels might benefit from a good course in mathematical logic.*

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