Book Review

The Man Who Loved Only Numbers

Reviewed by Paul Halmos

The Man Who Loved Only Numbers
Paul Hoffman
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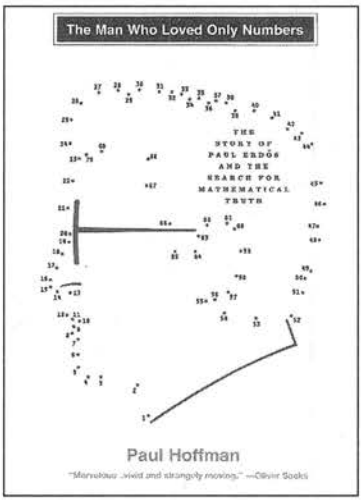
This book is about Paul Erdős (who lived from March 26, 1913 to September 30, 1996). He was a mathematician who lived and loved and breathed and thought mathematics and almost nothing else. The author obviously loves his subject; he writes with care and affection. Much of what he writes consists of quotations or paraphrases of what Erdős wrote and said. A fair way to review such a book seems to be to quote or paraphrase what's in it, and what follows is written in that spirit.

The book tells us to pronounce Erdős's name as "air-dish", but I don't agree. In some languages, including English and Hungarian, vowels can be short or long, as in word pairs such as "foot" and "boot". In Hungarian the distinction is indicated by diacritical marks on long vowels, so that "foot" would be "fut" and "boot" would be "bút". The accented o in Erdős's name is the so-called long Hungarian umlaut; it should be pronounced the way most people pronounce the ö in Gödel.

I don't know all the Erdős stories, but all the ones I know are reported in this book just the way I had heard them.

Erdős spoke English well and fast, but his pronunciation was idiosyncratic—it was difficult for some people to understand, especially the first time. One time when he was asked what he was doing just then, he said, "I am sinking on a seorem." When he allowed himself to talk about things other than mathematics, he used a language of his own: women were "bosses", children were "epsilons", and alcohol was "poison".



He loved children, and he fussed over them when he met them, but not for long—his patience was quickly exhausted. And he loved all children, not just the mathematically precocious, and doted on the epsilons of his collaborators. "People are always taking pictures of me holding babies," said Erdős. In one photo "the baby looked so content that somebody said, 'Uncle Paul is nursing.'" The younger the child was, the deeper his connection.

He liked to discover young geniuses, and he did. For instance, he discovered Pósa at age fourteen, Pelikán at fifteen, and Lovász at seventeen. One of his good friends and frequent collaborators was Béla Bollobás, who was fourteen when he met Erdős, who was forty-four. They had a forty-year collaboration that resulted in fifteen papers.

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Erdős loved to invent jokes and then to make exhaustive use of them. One that he was fond of telling was about his age: "When I was a child, the earth was said to be two billion years old. Now scientists say it's four and a half billion. So that makes me two and a half billion." In the early 1970s he started appending the initials P.G.O.M. to his name, which stood for Poor Great Old Man, and then kept expanding that initialized reference to his great age for the next quarter of a century.

With more than 484 coauthors, Erdős collaborated with more people than any other mathematician in history. Those lucky 484 are said to have an Erdős number 1, a coveted code phrase in the mathematics world for having written a paper with the master himself. If your Erdős number is 2, it means you have published with someone who has published with Erdős. If your Erdős number is 3, you have published with someone who has published with someone who has published with Erdős. Einstein had an Erdős number of 2, and the highest known Erdős number of a working mathematician is 7.

An important person in Erdős's life was Ron Graham, who handled many of Erdős's affairs—such as making sure that the visa on his passport was up to date, and managing his income, which dribbled in from four continents. "I signed his name on checks and deposited them," Graham said. "I did this so long I doubted the bank would have cashed a check if he had endorsed it himself." In 1970 Graham bet Erdős that he couldn't stop taking amphetamines for a month. Erdős accepted the challenge and went cold turkey for thirty days. After Graham paid up—and wrote the $500 off as a business expense—Erdős said, "You've showed me I'm not an addict. But I didn't get any work done. I'd get up in the morning and stare at a blank piece of paper. I'd have no ideas, just like an ordinary person. You've set mathematics back a month." He promptly resumed taking pills, and mathematics was better for it.

Back in the early 1950s Erdős started spurring on his collaborators by putting out contracts on problems he wasn't able to solve. By 1987 the outstanding rewards totalled about $15,000 and ranged from $10 to $3,000, reflecting his judgment of the problems' difficulty.

Near the end of his life he appreciated that his explanations were sometimes hard to follow. He realized this when he looked back at his old papers and was impressed by how hard it was for him to understand his own arguments of thirty or forty years earlier.

He was twenty-one when he buttered his first piece of bread, his mother or a domestic servant having always done it for him. "I remember clearly," he said. "I had just gone to England to study. It was tea time, and bread was served. I was too embarrassed to admit I had never buttered it. I tried. It wasn't so hard."

Erdős certainly didn't look like an athlete, but he was more athletic than he appeared. He was, for instance, an excellent ping-pong player—he played to win—fast and hard.

An ingrained characteristic of Erdős was his insistence on travel: if he spent as much as two weeks in the same town, or even in the same country, he became restless. As a result he frequently had visa problems, especially with the United States. In the early 1960s he repeatedly petitioned the U.S. Government to allow him re-entry, but his requests were rejected again and again. His comment: "The foreign policy of the State Department was adamant on two points: nonadmission of Red China to the United Nations and of Paul Erdős to the United States."

"When I first met Landau in 1935 in Cambridge," Erdős liked to recall, "he told me, 'Wir mathematiker sind alle ein bißchen meschugge.'"[1]

Ralph Faudree, one of his hosts, recalled: "One day when I came down to the kitchen, there was cereal, lots of cereal, all over the floor. I didn't understand how it got there. Even if he opened a new box and had to struggle to rip the plastic, that much cereal couldn't have shot out. I couldn't figure it out, so I just swept it up. The next morning I came down and there was cereal all over the floor again. Erdős was sitting there, dropping fistfuls of cereal, trying to feed the dogs."

One of Erdős's rare feminine contacts was Jo Bruening, who was his platonic friend and chauffeur for a while in the early 1960s, but she got tired of that and disappeared from his life.

His mother was a big part of his life. She was always on his mind, and he phoned her every day from everywhere. "Erdős mama" was famous in the mathematical world. "No son loved his mother more than Paul," said John Selfridge. "I got to know her well during the spring of 1966. She was a kind woman. We called her *Anyuka* [not "mother" but "mommy"] like Paul. ... When Paul died, I went to his funeral in Budapest. I hate funerals, but I am glad I went. The official memorial service ... was one of the largest ever held in Hungary, with more than five hundred people in attendance, as if it were the funeral of a head of state."

[1] "We mathematicians are all a bit nutty."