

# SCIENTIFIC AMERICAN

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## Profile: Martin Gardner, the Mathematical Gamester

**For 35 years, he wrote *Scientific American's* Mathematical Games column, educating and entertaining minds and launching the careers of generations of mathematicians**

By Philip Yam

*Editor's note: In light of the recent death of Martin Gardner, we are republishing this profile from the December 1995 issue of Scientific American.*

The clerk at the Barnes and Noble bookstore in downtown

Manhattan is not

all that helpful. Having had limited success with smaller retailers, I am hoping that the computer can tell me which of Martin Gardner's 50 or so books are available in the store's massive inventory. Most of his books, of course, deal with recreational mathematics, the topic for which he is best known. But he has also penned works in literature, philosophy and fiction. I am looking specifically for *The Whys of a*



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*Philosophical Scrivener*, Gardner's essays that detail his approach to life. The clerk tells me to try the religion section, under "Christian friction." Is he kidding?

A scowl breaks across Gardner's otherwise amicable face after I relate the story. He is puzzled, too, but for a different reason. The book has nothing to do with that, Gardner insists. He makes it a point to describe himself as philosophical theist—in the tradition, he says, of Plato and Kant, among others. "I decided I couldn't call myself a Christian in any legitimate sense of the word, but I have retained a belief in a personal God," Gardner clarifies. "I admire the teachings of Jesus, but to me it's a little bit dishonest if you don't think Jesus was divine in some special way"—which Gardner does not.

Theology and philosophy weigh heavily in our conversation, something I did not expect from a man who spent 25 years writing *Scientific American's* "Mathematical Games" column and who, in the process, influenced untold numbers of minds. "I think my whole generation of mathematicians grew up reading Martin Gardner," comments Rudy Rucker, a writer and mathematician at San Jose State University. It is not uncommon to run into people who subscribed solely because of the mathematical gamester, a realization not lost on the magazine's caretakers when he resigned in 1981. "Here is the letter I have been dreading to receive from Martin Gardner," memoed then editor Dennis Flanagan to then publisher Gerard Piel. "I had a lot of books I wanted to write," Gardner explains of his decision. "I just didn't have time to do the column. I miss doing it because I met a lot of famous mathematicians through it."

In his living room in Hendersonville, N.C., near the Great Smoky Mountains at the Tennessee border, he rattles off several of these notables. Roger Penrose of the University of Oxford, now a best-selling author about consciousness and the brain, first became famous after Gardner reported Penrose's finding of tiles that can coat a plane without ever repeating the same pattern. John H. Conway of Princeton University saw his game-of-life computer program, a metaphor for evolution, flourish after appearing in the column. Most surprising to me,

though, is Gardner's mention of the Dutch artist M. C. Escher, whose work he helped to publicize in 1961. He points to an original Escher print over my head, between the shelves of his wife's collection of antique metal doorstops. If he had known Escher would become famous, Gardner says, he would have bought more. "It's one of the rare pictures with color in it," he remarks. "It's based on Poincaré's model of the hyperbolic plane."

The 81-year-old Gardner seems more comfortable talking about others than about himself. Perhaps part of the reason is that he has no formal training in mathematics. In discussing his youth, he muses on religion and philosophy, topics to which we keep veering back. "When I grew up in Tulsa, it was called the oil capital of the world," he says. "Now it's known as the home of Oral Roberts. That's how far Tulsa has gone down the hill." He describes his father, a petroleum geologist, as a tolerant fellow who put up with his mother's Methodist devotion and Gardner's own early fanaticism. Influenced by a Sunday school teacher and a Seventh-Day Adventist, the young Gardner became convinced the second coming was near and that 666 was the number of the pope. "I grew up believing that the Bible was a revelation straight from God," he recounts. "It lasted about halfway through my years at the University of Chicago."

University life, however, slowly eroded his fundamentalist beliefs. "Certain authors have been a big influence on me," Gardner says and enumerates them. Besides Plato and Kant, there are G. K. Chesterton, William James, Charles S. Peirce, Miguel de Unamuno, Rudolf Carnap and H. G. Wells. From each, Gardner has culled a bit of wisdom. "From Chesterton I got a sense of mystery in the universe, why anything exists," he expounds. "From Wells I took his tremendous interest in and respect for science." That's why he does not accept the virgin birth of Christ or a blood atonement for the sin of Adam and Eve, as he writes in the afterword of his semiautobiographical novel, *The Flight of Peter Fromm*. "I don't believe God interrupts natural laws or tinkers with the universe," he remarks. From James he derived his notion that belief in God is a matter of faith only. "I don't think there's any way to prove the existence of God logically."

Pondering existence for a living, however, was not his calling. "If you're a professional philosopher, there's no way to make any money except to teach. It has no use anywhere," Gardner offers. Instead he turned to writing, becoming assistant oil editor for the *Tulsa Tribune* and then returning to Chicago to assume a post in the university's press office. In 1941 he began a four-year stint on a destroyer escort (fittingly, the U.S.S. *Pope*). After World War II, Gardner returned to Chicago, selling short stories to *Esquire* and taking more courses in philosophy under the GI bill.

Freelance writing is unstable, and Gardner found himself in New York City in the early 1950s, where he landed a regular job with the children's periodical *Humpty Dumpty's Magazine*, writing features and designing activities. "I did all the cutouts," he beams. But it was his lifelong interest in magic, still his main hobby, that led him to mathematical games. Every Saturday a group of conjurers would gather in a restaurant in lower Manhattan. "There would be 50 magicians or so, all doing magic tricks," Gardner reminisces. One of them intrigued him with a so-called hexaflexagon—a strip of paper folded into a hexagon, which turns inside out when two sides are pinched. Fascinated, Gardner drove to Princeton, where graduate students invented it. (A magician also played a pivotal role in another major step in Gardner's life: he introduced Gardner to his future wife, Charlotte.)

Having sold a piece on logic machines to *Scientific American* a few years prior (which, incidentally, included a cardboard cutout), he approached the magazine with an article on hexagons. "Gerry Piel called me in and asked, 'Is there enough material similar to this to make a regular column?' I said I thought there was, and he said to turn one in," Gardner recalls. It was a bit of a snow job: Gardner did not even own a mathematics book at the time. "I rushed around New York and bought as many books on recreational math as I could," he states. Gardner officially began his new career in the January 1957 issue; the rubric "Mathematical Games" was chosen by the magazine. "By coincidence, they're my initials," Gardner observes. "I always had a private interest in math without any formal training. I just sort of became

a self-taught mathematician. If you look at those columns in chronological order, you will see they started out on a much more elementary level than the later columns."

Gardner's timing was perfect. Only a few outlets for recreational mathematicians existed at the time. "A lot of creative mathematicians were making discoveries, but the work was considered too trivial by professional math journals to publish. So I had the pleasure of picking up this stuff." Perhaps more important to the success of the column was his nonmathematical background. "His references were so wonderfully cross-cultural and broad," Rucker states. "He talked about experimental literature, about cranks, about philosophers— relating mathematics to the most exciting things around." He was also able to form a network of associates who passed on ideas. "Martin was very good at giving attribution," says mathematician Ronald L. Graham of AT&T Bell Laboratories. "That inspired people to work on problems."

Gardner has a natural penchant for fun and games. In an April Fools' piece, he claimed Einstein's theory of relativity was disproved and that Leonardo da Vinci invented the flush toilet. At the suggestion of a friend, he harshly panned his own *Whys* book in a review written under the pseudonym George Groth. "I heard that people read the review and didn't buy the book on my recommendation," Gardner comments.

Although his home seems to display order and formality, Gardner's playfulness is everywhere. Optical illusions abound, including an inside-out face mask illuminated from below that appears holographic, eerily seeming to track a viewer's motions. He demonstrates several magic tricks with rubber bands, at one point rummaging through a closet to extract a fake, blood-dripping severed arm through which he wiggles his own fingers. This Wonderland feeling is appropriate, for Gardner is an expert on Lewis Carroll. His best-seller is *The Annotated Alice*, in which he shows that Carroll encoded messages, chess moves and caricatures of people he knew. In Los Angeles recently, wealthy electronics store owner John Fry inaugurated a new outlet containing 15-foot statues of the Alice characters—and Gardner was the honored guest.

After nearly 40 years of presenting math, Gardner says the biggest transformation in the field has been the entrance of the computer. "It's changed the character of all mathematics, especially combinatorial math, where problems are impossible to solve by hand. A good example is the four-color map problem, which was finally solved by a computer." The theorem states that at least four hues are needed to paint all planar maps so that no adjacent regions are the same color. Chaos theory, fractals and factoring of prime numbers are a few other examples.

Gardner himself does not own a computer (or, for that matter, a fax or answering machine). He once did—and got hooked playing chess on it. "Then one day I was doing the dishes with my wife, and I looked down and saw the pattern of the chessboard on the surface of the water," he recalls. The retinal retention lasted about a week, during which he gave his computer to one of his two sons. "I'm a scissors-and-rubber-cement man," Gardner says, although he feels he ought to get another computer despite the lasting impression his first one left.

Retirement does not find Gardner at rest. He writes for the *Skeptical Inquirer*, although he is planning to switch to topics that are not outright shams, such as Freud's dream theory and false memories evoked by therapists. And there is time for games. During my visit, an editor called to say that his firm wants to publish Gardner's manuscript on Lewis Carroll's mathematical puzzles. Gardner describes a recent problem he received from Japan, which dealt with an ant crawling on an extended cube. A mathematician phones to inquire whether Gardner heard anything about a rumor of a new result in Penrose tiling. And every afternoon at 4:30, he and Charlotte investigate fluid dynamics by mixing vodka martinis. For Gardner, the game is the life.