Martin Gardner
An Interview

Don Albers

On October 21, Martin Gardner celebrated his ninetieth birthday. For 25 of his 90 years, Gardner wrote the monthly "Mathematical Games" column for *Scientific American*. His columns have inspired thousands of readers to learn more about the mathematics that he loved to explore and explain. Among his column correspondents were several distinguished mathematicians and scientists, including John Horton Conway, Persi Diaconis, Ron Graham, Douglas Hofstadter, Richard Guy, Don Knuth, Sol Golomb, and Roger Penrose.

Gardner's columns have earned him a place of honor in the mathematical community, which has given him many awards. But he has always declined invitations to accept awards in person, on the grounds that he is not a mathematician. "I'm strictly a journalist," he insists. "I just write about what other people are doing in the field." His modesty is admirable, but we insist that he is far more than a journalist.

In addition to his massive contributions to mathematics, Gardner has written about magic, philosophy, literature, and pseudoscience. Over his first ninety years, he has produced more than 60 books, most still in print; many have been bestsellers. His *Annotated Alice* has sold over a million copies, and the 15 volumes collecting his "Mathematical Games " columns have gone through several printings. All 15 volumes have been digitized and are on this CD.

In his ninetieth year, he has returned to Oklahoma, where he was born. He is in good health and full of energy. We look forward to more from him as he begins his second 90 years. What follows is a portion of an interview done at Gardner's home in Hendersonville, NC in the fall of 1990 and spring of 1991.

Magic

DA: In 1914 you were born in Oklahoma. What did your father do?

Gardner: My father was a geologist who owned his own oil company. He was what they called a "wildcatter." It was a very small company consisting of himself, a secretary, and an accountant. He would go out and look for oil domes. This was before the seismograph. If he found a place that had a prospect of oil, he would hire a drilling company. Most of them were dry holes, but every once in a while he would hit oil.

DA: Does your interest in magic go back to your father?

Gardner: Magic wasn't a special hobby of his, but he did show me some magic tricks when I was a little boy. I learned my first tricks from him, in particular one with a knife

Martin, sister Judith, mother, and brother Jim at their Chautauqua cottage in 1925

and little pieces of paper on it. I then got aquatinted with a few local magicians in Tulsa, Logan Waite and Wabash Hughes, who worked for the Wabash Railroad.

DA: At what age did this occur?

Gardner: I was a high school student at the time. I've never performed magic; it's just been a hobby. The only time I got paid for doing magic was when I was a student at The University of Chicago; I used to work at the Marshall Field department store during the Christmas season demonstrating Gilbert magic sets. I learned a lot from the experience. That was the first time I realized that you're really not doing a magic trick well until you've done it in front of an audience about a hundred times. Then it becomes second nature, and you know what to say.

DA: What are the elements of a successful magic trick?

Gardner: The most important thing is to startle people, and have them wonder how it's done. Close-up magic that you do on a table right in front of people is very different from the stage illusions that David Copperfield does. It's close-up magic that most intrigues me, especially those that have a mathematical flavor. In fact, I'll show you a little trick here. (He then proceeded to demonstrate a neat topological trick that baffled the interviewer.) In recent years magicians have gotten interested in rubber band tricks that are all topologically based, i.e., they're violating topological laws. There are entire books published on rubber band magic. (He then demonstrated another trick, and another.) I did a book for Dover Publications on mathematical tricks that has a chapter on topological tricks. I did two massive books for the magic profession: *The Encyclopedia of Impromptu Magic* and *Martin Gardner Presents*.

DA: (Looking at the books.) Massive is right.

Gardner: The first book covers tricks that don't require any special equipment. A lot of them are just jokes and gags of the type 'bet you can't do this.'

DA: Your interest in magic is deep.

Gardner: I waste a lot of time on it. Dai Vernon was one of the great inventors of magic. He was a great influence on Persi Diaconis. Persi traveled with Dai for a long time. I knew Vernon very well. I knew Persi when he was a student at CCNY. You probably heard the story how he got into Harvard.

DA: As I recall, he gave you credit for writing a letter of recommendation to Fred Mosteller, the statistician.

Gardner: Mosteller is a magic buff. When Persi said he wanted to get into Harvard, I wrote to Fred and said that Persi can do the best bottom deal and second deal of anybody I know, and that got him into Harvard. I talked to Fred on the phone about it and he said, "Is he willing to major in statistics?" And Persi said sure he'd major in statistics if that would get him into Harvard. So he went up to Harvard, and they had a session together, probably doing card tricks. Mosteller got him into Harvard.

DA: Well, it was a good move on Mosteller's part. I'm certainly convinced now that your interest in magic is just not a passing fancy.

Gardner: It's my major hobby. I've enjoyed knowing a lot of famous magicians.

The Gardner boys: Jim, Dr. Gardner, and Martin

DA: You started talking about Dai Vernon.

Gardner: He was one of the greats — "The Professor" as he was known in magic circles. He taught Doug Henning.

DA: You know Ray Smullyan, too.

Gardner: I first met Smullyan in Chicago through magic circles, long before he became famous as a logician.

I had an interesting experience recently with a magic book called *The Expert at the Card Table* by S.W. Erdnase. If you spell that backwards you get E. S. Andrews. The book is a classic and I had a first edition of the book that I bought for about five dollars when I was quite young. A couple months ago, Richard Hatch, who runs a magic rare book store, in Texas, came out to see me to see if I had any books that he might want to buy and resell. I had a copy of this first edition, which I mailed to him before he came out to see me. He got very excited and angry with me because I hadn't insured it. I didn't know it had any special value. So he put it up for auction, and the book sold for over $2,000, to his surprise and mine. I don't even know who bought it. But the early magic books are now quite rare.

Tulsa Roots

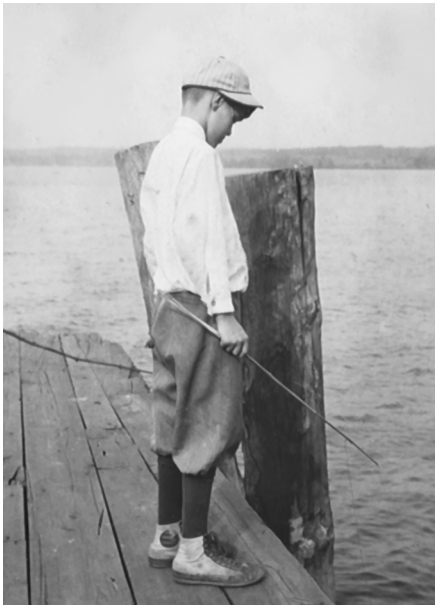
DA: What did your mother do?

Gardner: She was a kindergarten teacher before marriage, but then became a housewife, caring for three children. Her hobby was painting, and I have a number of her paintings hanging in the house. Both of my parents lived into their nineties. I had a brother and sister, both younger, who are deceased.

Hot rodder brothers, Jim and Martin, in 1920

Wannabee cowboys — Martin and Jim

I learned to read before I went to school. My mother read the *Wizard of Oz* to me when I was a little boy, and I looked over her shoulder as she read it. I learned how to read that way. It was very embarrassing when I was in first grade, because the teacher would hold up cards that said ‘cat’ and ‘dog’ and I was always the first to call out the word. She had to tell me to shut up, to give the other children a chance to learn how to read.



Martin fishing at Chautauqua in 1925

Martin, age $10\frac{1}{2}$

DA: But don't you think she was doing something to teach you to read?

Gardner: No, she didn't even know I was learning how to read.

DA: As a kid, do you remember other strong interests in addition to magic?

Gardner: I was very good at math in high school. In fact, it and physics were the only subjects in which I got good grades. I was bored to death by the other classes. I flunked a class in Latin and had to take it over. I just don't have a good ear for languages.

DA: How about sports?

Gardner: I played a lot of tennis. My father was fairly wealthy, and we had our own tennis court. I also was on the high school tumbling team. I particularly liked the high bar.

DA: Ron Graham is a good tumbler, too.

Gardner: Oh yes! Once I was meeting him for lunch at Bell Labs. A long flight of stairs

led to the front door of building. Ron greeted me by walking down the stairs on his hands! He is also an expert juggler and unicycle rider.

DA: You said that you did well in physics, too.

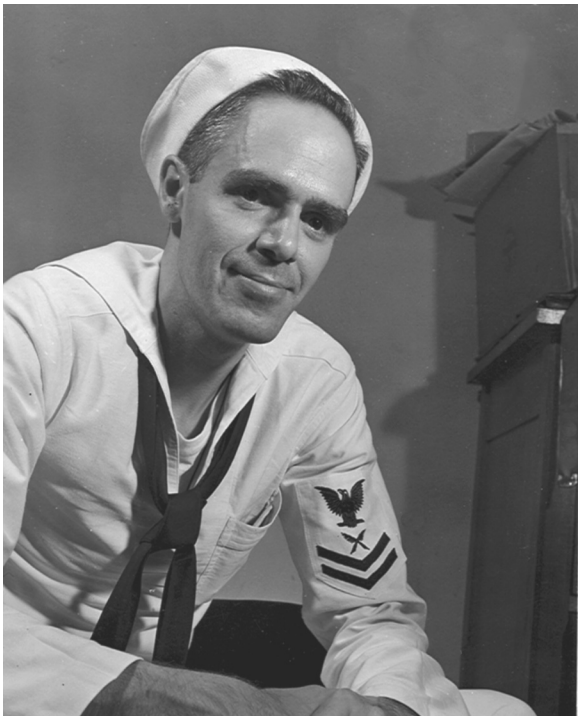
Gardner: Yes. My goal was to go to Caltech. A lot of exciting physicists were there — Millikan for one. But Caltech at that time required two years of liberal arts at a college before transferring. So I went to The University of Chicago intending to transfer to Caltech after two years, but I got hooked on philosophy, mainly to find out what I believed.

DA: Did you encounter the philosopher Rudolph Carnap as an undergraduate?

Gardner: No, he wasn't there then, but he was there after my four years of service in the Navy during World War II. Using the G.I. Bill, I went back to Chicago and took a course from him in the philosophy of science. I was so impressed by the course that I later persuaded him to do a book on the subject. His wife taped the lectures, and I edited them into a book. Carnap was a big influence on me. He convinced me that questions about metaphysics are meaningless since they cannot be answered empirically or by reason. The essence of Carnap's philosophy is that an assertion has "cognitive content" only if it can be justified by logic or by empirical testing.

DA: You got your B.A. in 1936, then worked briefly for the *Tulsa Tribune* as a reporter, and then came back to The University of Chicago to the PR office writing news releases (primarily science releases), and took a graduate course from Carnap. What else did you do until the outbreak of World War II?

Brothers Martin and Jim in rather fancy baseball togs



Martin, the sailor, in 1942

Gardner: I had various jobs. I worked as a caseworker for the Chicago Relief Administration, I had to visit 140 families regularly in what was called the Black Belt. I also had several odd jobs: waiter, soda jerk, etc. Remember, this was at the height of the Great Depression.

Navy Service

DA: In December of 1941, the U.S. entered World War II and you enlisted in the Navy.

Gardner: I ended up serving on DE 134, a destroyer escort, in the Atlantic. I was miserably seasick for about three days, and then I was never seasick again. I couldn't wait for the war to end, but later I looked back at it as a rather pleasurable time of my life. You're on a ship, you make friends with your shipmates, you got liberties now and then, and you didn't have to worry about anything.

I've had migraine headaches all my life that were fairly severe when I was in high school. When I enlisted in the Navy, I did not list my migraines because I was afraid they wouldn't take me. I feared that I might develop migraine headaches during battle situations. We were part of a so-called "killer group" of six destroyers looking for German submarines. During my four years in the Navy, I never had a migraine headache. I'm convinced that they're associated with periods of anxiety. When you're in the Navy, you don't worry about what you're going to do tomorrow, what tie to put on, etc. You just follow orders. In a way, you have a big sense of freedom. Otherwise, I have no other explanation.

DA: But when the war ended, you were glad to get out.

Gardner: At the time I was glad to get out. I was the yeoman who decommissioned the ship in Green Cove Springs, Florida. It was what they called a 'Caribou' for six. We worked together, sweeping and looking for German subs. When they were mothballed in Florida there was one missing; it got torpedoed and sunk.

DA: Over what period of time were the six DE's together?

Gardner: The whole time I was on the DE.

DA: Which was how many years?

Gardner: About three years. Before going to sea, I spent about a year at Madison, Wisconsin, which had a radio training school there. I handled public relations for the school, and edited a school newspaper.

DA: In 1942, German submarines were devastating allied shipping.

Gardner: Yes, they were. We were very lucky. This happened before I joined the DE, but when I went aboard the sailors were all talking about it. The group actually captured a German submarine early in the war, intact, and towed it back. It was top secret, nobody

Martin (right) getting ready to ship out

Martin (center) at Great Lakes Naval Training Facility

knew about it. Now that submarine is on exhibit at the Museum of Science and Industry in Chicago. I had the pleasure of walking through it one day when I was in Chicago. But that happened before I was on the ship; I missed that action. But we did take back a German submarine at the end of the war that surrendered to us.

The Horse on the Escalator

DA: So then you were mustered out, and promptly went back to Chicago.

Gardner: Yes, I went back, and I could have had my old job back in the public relations office at The University of Chicago because there was an understanding that if you enlisted in the service you could get your old job back. But the one reason I didn't go back to the PR office was that I sold a story, my first sale, and it was to *Esquire Magazine*. It was a short story, called "The Horse on the Escalator." It was a humorous story, a crazy story. It was about a man who collected shaggy dog jokes about horses, sort of nonsense jokes about horses. The title of the story, "The Horse on the Escalator," came from a joke going around at the time about a man who entered Marshall Field's department store on a horse,

and the elevator operator told him he couldn't take the horse on the elevator. And he said, "but lady, he gets sick on the escalator!" That was the shaggy dog joke about a horse. And that was the title of my story. It's a story about a man who collected horse jokes, and his wife didn't think any of them were funny, but she laughed heartily every time he told one to conceal the fact that she didn't think they were funny. So that was my first story, and that was the first time I had gotten paid. I had articles published before in little magazines, but they didn't pay anything. I decided that maybe I could make a living as a freelance writer, and I very quickly sold *Esquire* a second story, and that was the "No-Sided Professor," about topology. That's one I had anthologized a number of times. So all of a sudden I was making pretty good money, and I lived on sales to *Esquire* for about a year or two. I sold them about 12 stories. They're collected in a book by the way, titled *The No-Sided Professor and Other Stories*. Not all of my *Esquire* stories are in there; a few that I didn't think were very good were left out. Some of the stories are from other magazines.

DA: Here's the book, and here's "The Horse on the Escalator."

Gardner: That was my first story (laughing). By the way, it includes a long poem in free verse that I wrote about the ship I was on. It's called, "So Long, Old Girl."

My son Jim called me a few weeks ago to ask if I had ever written a poem about a ship. And I said, "yes." He said "did it have something about girls in it?" And I said, "yeah, why do you ask?" He has a son William who is interested in dramatics, and was trying out for a part at some dramatics school. Someone else, who was also trying out for a part, recited that poem. William said, "I think Grandfather wrote a poem about a ship. Somebody recited a poem, something about a ship called girl." How he ever found that poem I don't know. He must have picked it up from the book collection.

I have written two other books of fiction. You probably know about them.

DA: *The Flight of Peter Fromm* I've read.

Gardner: You actually read it? My goodness!

Martin and Charlotte

DA: To what extent is it autobiographical?

Gardner: It is partly autobiographical. I don't resemble Peter, the book's hero, in personality or looks, but I did put him through changes in my own beliefs because when I was in high school I was converted to a very ugly Protestant fundamentalism, mainly through the influence of a Sunday School teacher who was later a counselor at a summer camp I went to. That didn't last very long, but it lasted long enough for me to try to figure out some way I could preserve a belief in Christianity. I finally ended up deciding I couldn't. So I put Peter through changes in my own beliefs, and in that sense it's autobiographical.

DA: It's a book you seem especially fond of. What motivated you to write it?

Gardner: I wanted to put into a novel my reasons for abandoning Christianity, but retaining a belief in God. I'm what in academic circles is called a "philosophical theist."

Learning to Read with Oz

The other fiction book I did, you might not know about, is an Oz book that I wrote last year. I grew up on the Oz books, and I was really fond of them. I've done introductions to a lot of Dover reprints of books by L. Frank Baum, author of *The Wizard of Oz*. My *Visitors from OZ* is an imitation of an L. Frank Baum Oz book. The Klein Bottle runs all the way though this book. In one of Baum's Oz books, he had Glinda cast a spell over Oz, making it impossible for outsiders to visit Oz again. I argue in my Oz book that the spell that Glinda cast was moving Oz through a higher dimension into a parallel world. I used the science fiction concept of a parallel world, separated though the space of a fourth dimension.

The basic plot of this book is about how Dorothy and the Scarecrow and the Tin Man visit New York City to help publicize a new movie about Oz. In order to get from the parallel world to Central Park, they make use of the Klein Bottle, because it's open in the fourth dimension. So they slide though the Klein Bottle, and drop out through the spot where it's going though the Fourth Dimension. That lands them into an adjacent parallel world, into Central Park. They use that to get to Central Park, then they use it to get back to Oz. The Klein Bottle, by the way, is made by a fellow named Ku-Klip. He's the tinsmith who put the Tin Woodman together after the Woodman chopped his fleshly body to pieces with an enchanted ax. By the way, the book is doing much better in England than it is here, which is curious, you know, because Baum is an American author, and the English don't know much about Oz. All they know is the Judy Garland film. This book had very few reviews, and the one review it got in the *Washington Post* wasn't very favorable. The reviewer called it a "poor thing of a novel." On the other hand, the *London Times* gave it a full-page admiring review.

Origin of Writing Interests

DA: When do you think your writing interests first appeared? Originally you said you were going to do physics, but then you ended up going to Chicago, where you discovered philosophy. Your first job was with the *Tulsa Tribune* as a reporter. When did the writing bug really hit you?

Gardner: Oh, I think not until I got out of the Navy, and that is when I started selling stories to *Esquire*.

DA: But you were writing before then.

Gardner: Yes, news releases and other minor stuff, but nothing of any great importance. I had some fiction published in "little magazines."

DA: This was the Depression, and that had something to do with it. But why would you take a job as a reporter, because that's deadline writing?

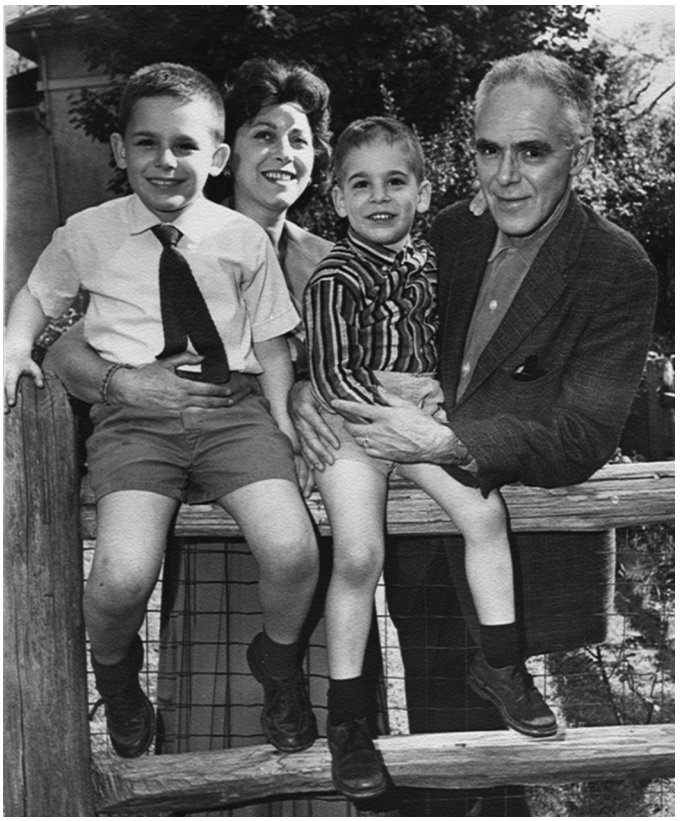
Gardner: It just happened to be available at the time; it was an opening. As a low-level job, I think I made $15 a week.

DA: So you had your own particular passion for writing.

Gardner: No, not especially.

DA: But then you went on to write news releases at The University of Chicago.

Gardner: Yes, the jobs I've had have been more or less accidental. I knew somebody who said there was an opening, and I knew someone in the public relations office who said there was an opening there. I needed a job, so I started work there.



Martin and Charlotte with their sons Jim (left) and Tom

DA: After the *Esquire* piece, you sold more stories to *Esquire*. That had to give you a lot of confidence, helping to convince you that you could earn a living as a writer.

Humpty Dumpty's

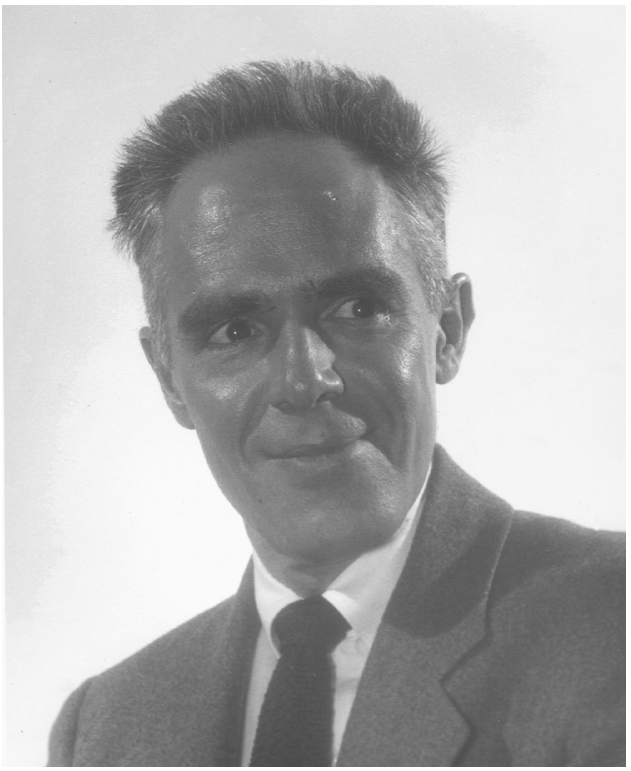
Gardner: That's right, it's not until I started selling stories to *Esquire* that I thought I could make a decent living as a freelance writer, but *Esquire* changed editors after I had sold them many stories. The new editor had a different policy, and he didn't care for the kind of stories I was writing. So I moved to New York City because that's where all the action is for writers. And that's when I got a job at *Humpty Dumpty's Magazine*.

DA: Now that's a curious move.

Gardner: I had a friend who worked for Parents' Institute, and who was in charge of their periodicals for children. They were starting a new magazine called *Humpty Dumpty's*, and were looking for activity features, where you fold the page or stick something through the page, or cut; where you destroy the page. So he hired me to do the activity features for *Humpty Dumpty's*.

DA: Had you ever done anything like that?

Gardner: No, but I grew up on a magazine called *John Martin's Book*. Everybody's forgotten about it. It flourished in the twenties, and the art editor, George Carlson, did activity features for *John Martin*, where you cut things out of the page and fold them into



Martin, smiling after finishing another Mathematical Games column

things, pictures that turned upside down, or you held them up to the light and saw through. I'd always been intrigued by George Carlson's activity features, and so I started out just sort of imitating George Carlson, taking up where he left off, and inventing new ideas of my own. I did that for eight years. I did the activity features, and I did a short story in every issue about the adventures of Humpty Dumpty, Jr. The magazine is supposed to be edited by Humpty Dumpty, who's an egg. The wife of the publisher thought of the idea of having Humpty edit the new magazine. She suggested a series of tales about a little egg, who was Humpty Dumpty's son. I started with the first issue of the magazine, and continued as a "contributing editor" for eight years. The magazine came out ten times a year, so I had eighty short stories about Humpty Dumpty, Jr. that I've never had reprinted. I haven't found a publisher for them yet. Most of the books that come out for children now are done by artists, and they're mainly art books with small amounts of text underneath the pictures. Not being an artist may be one reason I can't sell any of these stories. I worked hard on these stories. I have the rights to the stories but not to their illustrations. I also did a poem in every issue —"Advice from Humpty Sr. to His Son." —Poems of moral advice. They're just jingles, and I did get a book out of them. It was published by Simon and Schuster, titled *Never Make Fun of a Turtle, My Son*. The title refers to a poem about how you shouldn't make fun of people who are different from you.

DA: This must have taken a lot of time to do.

Gardner: Yes, it was my only job. I'd gotten married and we had a son to support, and I couldn't make a living in New York freelancing. I made maybe a sale or two of something trivial, but not enough to live on. So I jumped at the chance to work for Parents. I worked at home. There was a short period where I went to the office and edited a magazine for girls called *Polly Pigtails*. I was Polly Pigtails. I wrote a letter for each issue from Polly Pigtails to her readers. It later changed its name to *Calling All Girls*.

DA: So you actually edited a magazine aimed at girls.

Gardner: Yes, I did that, for maybe the first six issues. And I also started another magazine that lasted only three issues, called *Piggity*, and for that I did a short story in each issue about a little pig. I also had some good ideas on activity features. Are you familiar with the "Klutz" books?

DA: Yes.

Gardner: Well the fellow who puts those out, John Cassidy, is a friend. He's been out to see me a few times, and I've given him material for several of his books. He was out to see me just last month, looking for activity features for a book he is going to bring out. So I photocopied about 50 activities features for Cassidy. And he bought them all. I don't know how he's going to use them. I don't know how he's going to redo the art. So I did get some extra mileage out of those issues. I had some novel ideas. For example, one feature was called "See Tony Eat Spaghetti." You'd punch a hole in Tony's mouth, and there was a plate there. You take a white piece of string, and push it from the back of the page through his mouth, and then you pull the string out of the mouth and you go "ssslurp." You pull it from the back, so you see Tony slurp up spaghetti. Shari Lewis' father was a

magician. I knew him, and I knew Shari slightly when she lived in New York. She copied Tony's picture on a big piece of cardboard and demonstrated it on her television show. She was a fine ventriloquist, one of the best, using a hand puppet called Lamb Chop.

DA: She was very popular for a long time.

Gardner: She was a wonderful ventriloquist. Her father performed magic, under the name of Peter Pan. Occasionally Shari would do a little magic trick on her show. She died last year.

DA: She was young when she died.

Gardner: Yes, she was quite young. She was married to Mr. Tarcher of Tarcher Books.

Mathematical Games

DA: Your work with children's magazines continued to about 1956. By 1957 you were at *Scientific American*. So there was not much of a hiatus between *Humpty Dumpty's* and *Scientific American*.

Gardner: No, I stopped working for *Humpty Dumpty's* to start the column, "Mathematical Games," at *Scientific American*. I couldn't do both. It started with a sale in December 1956, of an article on Hexaflexagons. That was not a column, but it led to the column. When Gerry Piel, the publisher of *Scientific American*, called me and suggested the column, that was when I resigned from Parents.

DA: How long did it take you to accept Piel's offer?

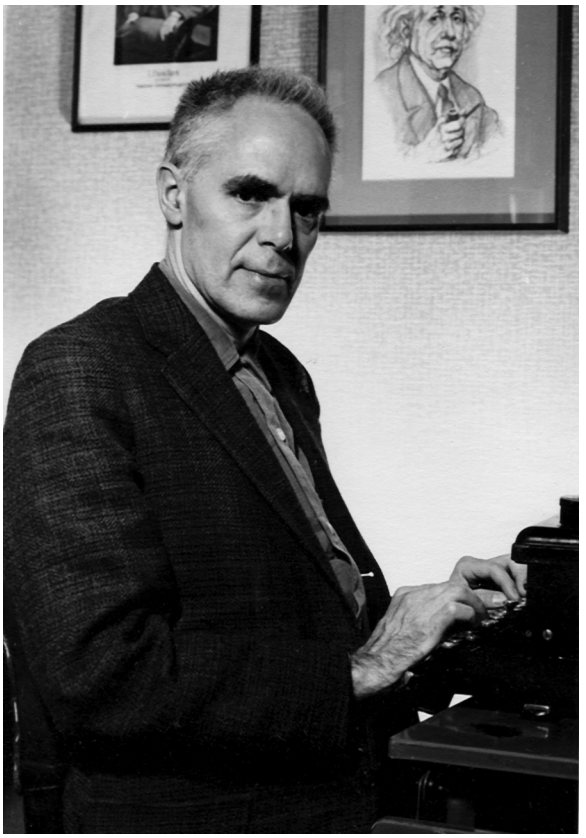
Gardner: I accepted it instantly, with surprise and delight. Indeed, my first column appeared in the January 1957 issue.

DA: You must have had a lot of confidence to take on a monthly column on mathematics in a sophisticated magazine like *Scientific American*, especially in view of the fact that the last math course you had was in high school.

Gardner: I had always been interested in recreational math ever since as a boy my father gave me a copy of Sam Loyd's famous **Cyclopedia of Puzzles**. In later years I would edit for Dover two paperbacks of Loyd's mathematical puzzles. After Piel proposed that I do a monthly column I rushed to the used bookstores area of Manhattan to buy all the books I could find on recreational math. That was when I obtained my first copy of W. Rouse Ball's classic **Mathematical Recreations and Essays**. It was a great source of ideas for my early columns.

DA: A lot of people are astonished that anyone could turn out a column on mathematical games every single month for twenty-five years.

Gardner: Perhaps they don't realize I had no other job. I'm not a professional mathematician who has to teach a course in mathematics, and then write. To me, it's hard to imagine how a professional mathematician would have time to even write a book. I had nothing else to do, except research for those columns, and write them up.



Martin hard at work

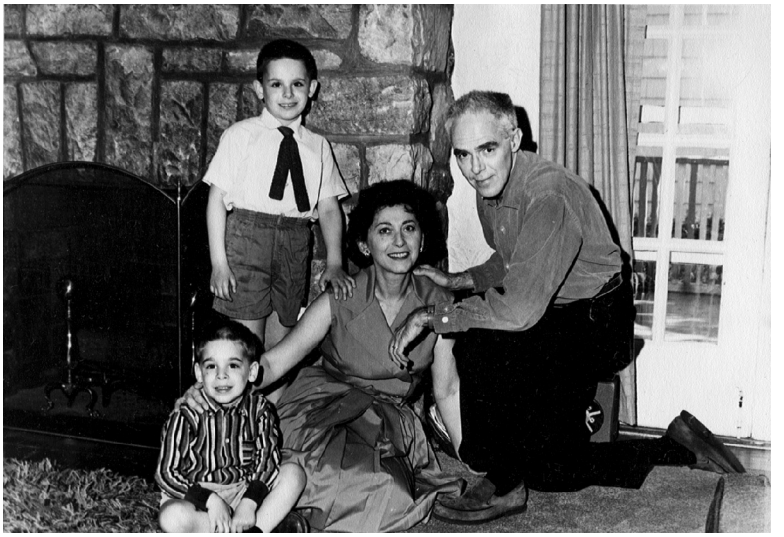
DA: Well, having the time certainly helps.

Most people that I've ever talked to about your *Scientific American* columns know that that was your job, but they're still awed by the fact that you turned out something really sparkling every month. It's one thing to write something every month, but that doesn't mean that it's going to be inspirational or great fun to read each time.

Gardner: I miss doing those columns, they were a lot of fun, and I met many fascinating people while doing them. Once the column got started I began hearing from people like Sol Golomb and John Conway, who were really doing creative work that had a recreational flavor. That kept the column going. It became much more interesting after I began getting feedback from people like John Conway, Ron Graham, Don Knuth, and many others.

DA: What is it about mathematics that you find so attractive?

Gardner: I suppose it's the fact that in mathematics, unlike in science which is fallible, you can prove astonishing results with absolute certainty. Of course a proof must always be within a formal system. The Pythagorean theorem, for example, is certain only within the formal system of Euclidean geometry. It doesn't become false when it fails in non-Euclidean geometries because such geometries are different formal systems. Mathematical theorems are timeless truths, analytic in nature like the great truth that three feet are in a yard.



Martin with wife Charlotte and sons Jim (standing) and Tom

DA: Complete the following: " I enjoy mathematics so much…"

Gardner: Because it has a strange kind of unearthly beauty. There is a strong feeling of pleasure, hard to describe, in thinking through an elegant proof, and even greater pleasure in discovering a proof not previously known. On a low level I have experienced such a pleasure four times. (1) I discovered the minimal number of acute triangles into which a square can be dissected. (Coxeter includes the dissection in his classic *Introduction to Geometry*.) (2) I found a minimal network of Steiner trees that join all the corners of a chessboard. (3) I constructed a bicolor proof that every serial isogon of 90 degrees—a polygon with all right angles, and sides in 1,2,3… sequence—must have a number of sides that is a multiple of 8. (4) I devised a novel way to diagram the prepositional calculus.

Life, Consciousness, and Mysterians

Probably my most famous column was the one in which I introduced Conway's game of *Life*. Conway had no idea when he showed it to me that it was going to take off the way it did. He came out on a visit, and he asked me if I had a Go board. I did have one, and we played Life on the Go board. He had about 50 other things to talk about besides that. I thought that *Life* was wonderful—a fascinating computer game. When I did the first column on *Life*, it really took off. There was even an article in *Time* magazine about it.

DA: Wasn't there a *Life* journal of sorts for a while?

Gardner: Yes, Bob Wainright did a periodical called *Lifeline*. Lots of famous mathematicians contributed to it.

DA: I don't think there is any doubt that when students encounter *Life* today for the first time, there's still a lot of excitement. It has a natural quality to it that captures people.

Gardner: And there are people still working on *Life*, still making new discoveries?

DA: There's a guy up at MIT named Hans Moravec who's done some work on *Life*.

Gardner: He's the robot man. In one of his books he explained a fast algorithm for *Life*. He's in charge of a robot laboratory at Carnegie-Mellon University. He is of the opinion, and he's done two books about it, that's it's only a matter of about 40 years from now until computers will be doing everything that humans do. They will be self-aware, they'll have free will; they'll be writing great poetry. We'll be the ancestors of a new breed of beings that are going to be the computers. Moravec actually believes it. His first book about this was called *Mind Children*. These are the children that we are going to spawn, this race of super computers. The human race will become obsolete. The computers are going to take over, and then they're going to start exploring space, and colonizing the galaxy. He really believes it.

You know the problem of consciousness is a hot topic right now. There have been half a dozen books published just in the last year or two. All of them are trying to figure out what it is in the brain that makes you self-aware. Of course, materialists like Moravec, and Churchland and his wife, are of the opinion that is it only going to be a short time until we figure out how the brain makes itself aware. But there is another school of philosophy that is coming into prominence now, with which I am sympathetic. They're called the Mysterians. The Mysterians, and this includes a number of very top notch philosophers like Donald Chalmers, Colin Magin, John Searle, Thomas Nagel, Jerry Fodor, Noam Chomsky, and a bunch of others, are of the opinion, and I share this view, that consciousness is something so mysterious that no one has the slightest idea how the brain makes itself aware, and we may never find out. That's the extreme Mysterian position, that we don't have the intellectual capacity ever to solve the problem of consciousness. It may be something beyond our power to understand; the way calculus is beyond the mind of a chimpanzee. It's an interesting point of view because it may be that there are some questions beyond the reach of science because of the limitations of our present brain. Perhaps in a million years from now, if we evolve with bigger brains, we'll solve it. Roger Penrose is a Mysterian. This was one of the themes of his famous book *The Emperor's New Mind*, for which I wrote the introduction.

Martin demonstrating a magic trick

We Mysterians think consciousness won't be understood for at least a long, long time. Also, the Mysterians believe that self-awareness and free will are two names for the same thing. If you try to imagine yourself without self-awareness, then you can't imagine yourself having free will to make decisions. You'd be like an automaton.

"I just write as clearly as I can."

DA: Can you tell me a little bit more about how you actually approach writing? You previously said something about how you did your monthly columns over a long period of time. You write about many other things as well. Do you have a different style or a different mode when you write about pseudoscience?

Gardner: I don't think so. I've never worried about style. I just write as clearly as I can, and I suppose it's improved over the years. I get interested in a topic, and I do as much research as I can on it. I have my library of working tools, so I can do a lot of research right here at home. I usually rough out the topic first, just list all the things that I have to say, and then I sit down and try to put it together on the typewriter. It's all kind of a sequence. That is hard to explain. It comes easy for me, I enjoy writing and I don't suffer from writer's block, where I sit and wonder for an hour how I'm going to phrase the opening sentence.

DA: So you're not like some of these people who say 'OK,' I'm going to get up early each day and write or I'm going to write each day over a fixed period.

Gardner: No, I don't have any rigorous schedule.

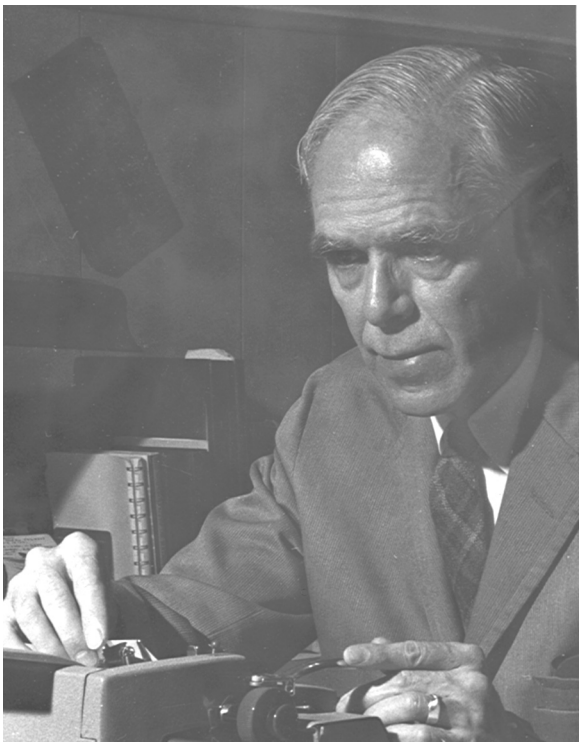
DA: I'm glad to hear that. That's probably another reason why you're going to live 150 years.

Gardner: Well, I doubt that, but I don't have any fixed schedule. My wife Charlotte and I could take off in the middle of the week and go somewhere for a few days and come back. I can work all day Sunday.

Adam, Eve, and Navels

DA: In 1979, you talked about retiring from *Scientific American* that year, because you were going to turn 65. Some of us expressed real sadness at the fact that you weren't going to be cranking out those monthly columns anymore. You said that there were other things that you really wanted to write about that you were afraid you were never going to get to unless you gave up the columns. You've had a lot of time to do that and you're written quite a lot since then.

Gardner: Well, I do a regular column in *The Skeptical Inquirer*, and those columns get reprinted in books. There's one due out in another month. Norton is doing a collection of *Skeptical Inquirer* columns. My editor there is Bob Weil who earlier was at St. Martin's. Now he's a top editor at Norton. He thought of a great title for the book—"Did Adam and Eve have Navels?" That was one of my columns. It's a very perplexing problem for Biblical fundamentalists. It's hard to figure out, because if they had navels it indicated an



Martin with his trusty typewriter

event that never took place. And of course it applies to hundreds of other things too. Did trees in the Garden of Eden have rings? If they were really trees, they had to have rings, but the rings indicate growth over time, alternate winters and summers.

DA: So how did you deal with the navel problem?

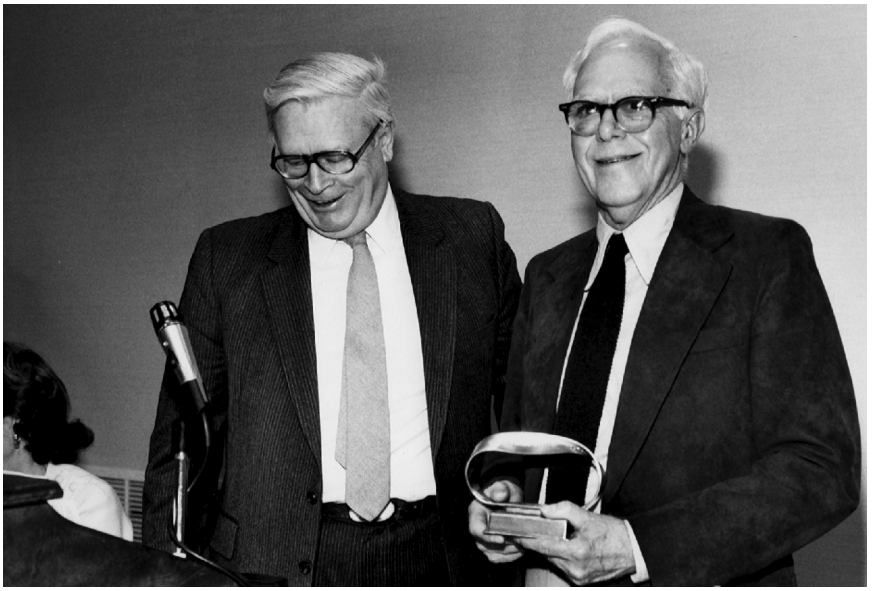
Gardner: I just sort of give a history of it, and various opinions that theologians have had toward the problem.

DA: I'd never heard that posed as a problem before, but I can understand why it would drive some people crazy.

Gardner: Oh, it's a big problem for fundamentalists. Whenever I meet fundamentalists I usually ask them about that, and they're very puzzled.

DA: I wanted to ask you a little bit about some of your own favorite authors. You've revealed the names of some of them in your writing. Chesterton, for one, must be pretty high on your list.

Gardner: I'm very fond of Chesterton, without, of course, buying his Catholicism. I'm not a Catholic. Chesterton didn't convert to Catholicism until rather late in life. I admire Chesterton mainly for his fiction. His masterpiece was a novel called, *The Man Who Was Thursday*. I recently annotated it for a Catholic house, because only a Catholic firm would have allowed me to annotate it. Ignatius Press is a Catholic publisher in San Francisco. Last year they published the, *The Annotated Thursday*. This is a fantasy novel by Chesterton,



Martin receiving the Möbius Award for his article "Quantum Weirdness"

and I think it's a masterpiece; it's all about free will and the problem of evil. I could tell you the entire plot but it would take a while. It's about a man named Sunday who's running an anarchist organization in London. Chesterton wrote this at a time when anarchism was a big deal. The council of this anarchist society is made up of seven men who are named after days of the week, and this is about the man who was Thursday on the chief council. But it ends up as a theological fantasy and Sunday becomes a symbol of nature, which has a good and evil side. It's a very complicated philosophical novel. I recommend it entirely, and, of course, Chesterton is mostly famous for the Father Brown books. I did annotate a Father Brown book, published by Oxford. There were six Father Brown books. The first was called, *The Innocence of Father Brown*, and I did an annotated edition. I've done introductions for Dover to a number of Chesterton's other books of fiction.

Another of my favorite authors is H. G. Wells. Wells and Chesterton were friends, and you can't imagine two people who were so opposite in their views because Wells was an atheist. In his youth he went through a brief period believing in the finite god concept, the concept of a limited god, then he outgrew that and became an atheist. Chesterton, of course, converted to Catholicism, and became a devout Catholic.

Philosophical Theism

I did a confessional, I don't know if you've seen it or not, called *The Whys of a Philosophical Scrivener*. I have a chapter in there where I say that if you can imagine someone who can admire both Wells and Chesterton, then you get a glimpse of my own philosophical views. I am a philosophical theist. I believe in a personal god, and I believe in an afterlife, and I believe in prayer, but I don't believe in any established religion. This is called philosophical theism. It was defended by a lot of famous philosophers, starting with Kant. It includes Charles Pierce and William James and my favorite philosopher

Miguel de Unamuno, a Spanish philosopher, who's not very well known, Ralph Barton Perry, Edgar Brightman, and I could name a lot of other thinkers who were philosophical theists without identifying themselves with any particular religion.

My wife Charlotte and I were a mixed marriage, by the way. She was Jewish, but we were both philosophical theists. When we got married, I wanted to affiliate with a reformed synagogue, but Charlotte refused because she had no beliefs in traditional Judaism, any more than I have in Christianity. She countered by saying that we could join a Methodist Church, since my background was Methodist. I refused. So we didn't go to any church, but we profess a kind of philosophical theism which enables me to admire many religious writers like Chesterton.

DA: Do you think that there may in fact be a larger body of people out there who, whether they know it or not, are philosophical theists?

Gardner: I think so, yes.

DA: But for whatever reasons, they don't find it wise or comfortable to say things like that.

Gardner: That's right, absolutely. There are a lot of closet philosophical theists. I just wrote a long review of Gary Wills' new book, *Papal Sin*, a vigorous attack on the Catholic Church, on the hierarchy. He is a devout Catholic, but he doesn't believe in any of the unique Catholic doctrines. He doesn't believe in the Immaculate Conception, he doesn't believe in the Virgin birth, he doesn't believe in the Assumption of Mary, and he doesn't believe in Papal infallibility. So I praised the book, in a review for the *L.A. Times*. I end it by saying to Wills "We need to know what you really believe." I give a list of six questions I would like for him to answer, and of course he's not going to answer any of them. I say that this mystery about what he really believes hangs like a kind of gray fog over everything he writes about religion. He's written several books about religion, all of them a blast at Roman popes and traditional dogmas. I can't imagine why he calls himself a Catholic. He wants to reform the Church. Of course, he's not going to.

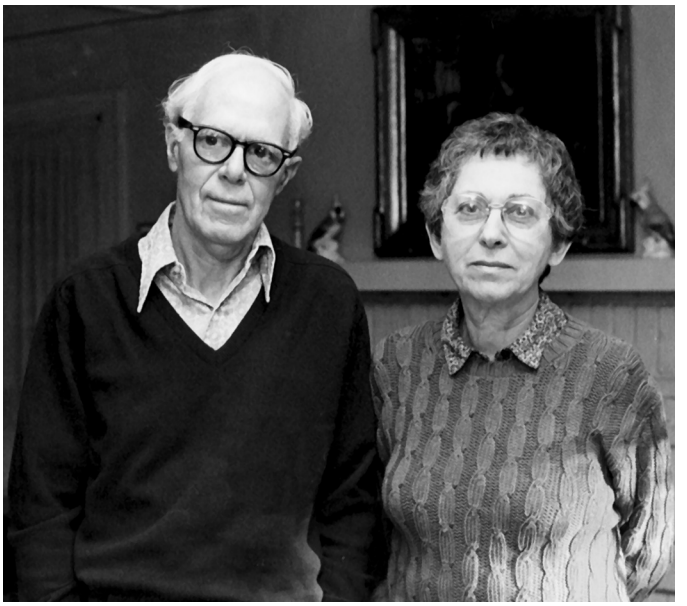
DA: Not with all of those points of attack under his belt.

Gardner: He has harsh things to say about Pope John Paul. Wills started out as a friend of William Buckley, and his first job was working on the *National Review*. He had been in a Jesuit seminary until he left the seminary to take a job as a book reviewer and drama critic for Buckley. They became good friends, but now they're at opposite poles. Buckley believes all the Catholic doctrines; he's an ultraconservative Catholic. He did a book recently, a confessional. Buckley is more conservative in his religious views than he is politically; he's ultra orthodox. He's even mad at the church for dropping the Friday prohibition on meat eating. *Nearer, My God* is the title of Buckley's latest book, the first he's written about his religion opinions. I reviewed it unfavorably for the *L.A. Times*.

The Trap Door Spiders

DA: To date, you've written more than 60 books.

Gardner: The count is rather vague because some of the books I've written are pamphlets or booklets, in the magic field. You don't know whether to call them books or not, because



Martin and Charlotte

they are more like paperbound booklets that may be only 50 pages or so. But if you consider hardcover books, it's about 60.

DA: By any standard, that's a lot.

Gardner: Of course I'm far behind Isaac Asimov; he did over 300. I got to know Isaac pretty well when I lived in New York. We belonged to a very strange little group that met once a month called the "Trap Door Spiders." Did I ever tell you about that?

DA: No, please do.

Gardner: It started out as a group of science fiction writers, about 20 members, all male, who met once a month. Wives are not invited. Members take turns sponsoring the dinners. The person who sponsors the dinner gets to invite a guest. After the dinner is over the guest is put on the hot seat and you can ask him or her any question. A female can be a guest, but not a member of the organization. Members included Lester Delray and Fletcher Pratt, a couple of top science fiction writers. I got myself voted in. You can become a member only when a member dies. It's sort of a secret organization. Isaac was one of the members, so I got to see him every month when we met for dinner.

Isaac wrote a series of mystery stories based on the "Trap Door Spiders," called the *Black Widow Spider's Mysteries*. They appeared first in Ellery Queen's mystery magazine, and later came out as books. They're very funny stories, very Chesterton-like, they're similar in some ways to the Father Brown stories in the type of gimmicks Asimov uses. Every story follows the same pattern of the Black Widow Spiders having these monthly dinners in which they invite a guest, but in Asimov's stories the guest has to be someone with a mystery that needs to be solved, not necessarily a murder mystery but some type of mystery. So the guest tells all the details about the mystery, then the members of this club

bring their experiences to bear and try to figure it out. The mystery is finally solved, and this is in every story, by Henry the waiter. He serves the dinner, and listens to everything everybody says. They're very close to solving the mystery, but they can't quite solve it, and so Henry says, "Have you gentlemen considered…" and Henry finally solves it. Every story follows that pattern. When I was living in New York I brought Steve Kanfer, who was a neighbor of mine, as a guest and they voted him in as a member. He has just hit the jackpot with his biography of Groucho Marx. You've probably been reading about it.

DA: Yes, there was a front-page review of it in *New York Times Book Review* a few weeks ago.

Gardner: Yes, it's doing very well. Kanfer, a former book review editor of *Time*, lived in Hastings-on-Hudson a few blocks from us; I got to know him well. He recently sold movie rights to his Groucho biography.

DA: Who knows, you may get movie rights to one of your books.

Gardner: No, I was hoping maybe my Oz book would be a candidate, but nobody picked it up. Naturally I think it would make a great movie.

My Favorite Book

DA: Which of your books is in some sense a favorite?

Gardner: I think my *Whys of a Philosophical Scrivener* is my favorite because it is a detailed account of everything I believe.

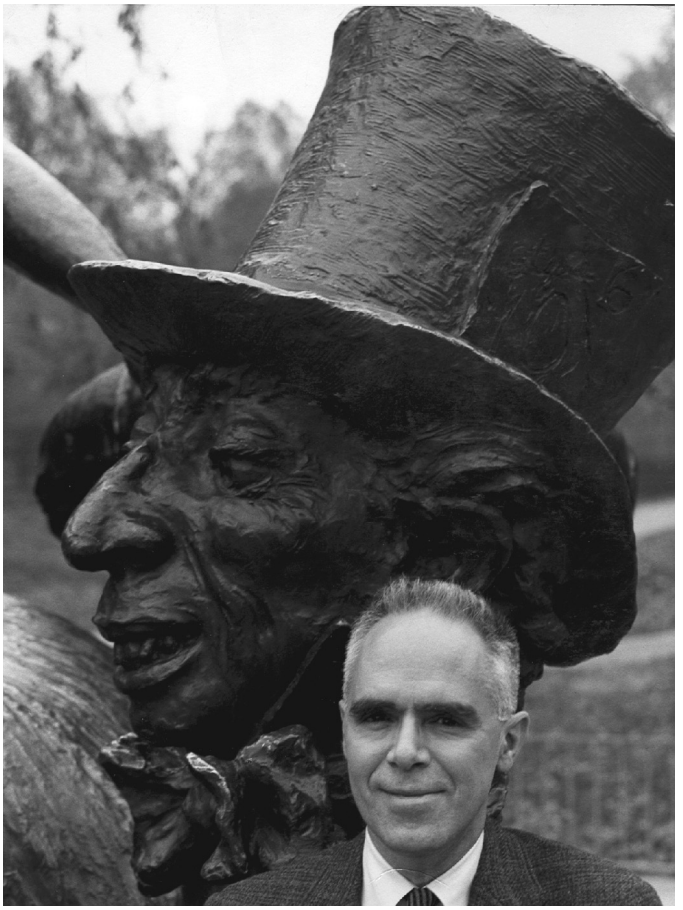
DA: When you tell people what you believe, unless it's Pablum-like, there's likely to be some strong reaction.

Gardner: Well, the book is controversial because almost everybody who believes in a personal god is into an established religion. The idea of believing in God and not being affiliated with any particular religion is a strange kind of a position to take.

DA: Did the reviews really focus on that?

Gardner: It didn't get many reviews. It got some good reviews mainly by Christians. The best review was by an Anglican priest, who reviewed it for an Anglican journal. It was a ten-page review. That was the best review it ever got. Actually, a lot of liberal Protestants and very liberal Catholics are really philosophical theists, but they won't use the term. A lot of prominent Protestant preachers who are liberal Protestants don't buy any of the traditional doctrines. Take Harry Emerson Fosdick and Norman Vincent Peale, for example. You don't know what they believed about any Christian doctrine. I don't think Norman Vincent Peale bought the virgin birth or the bodily resurrection, but he had a big following among conservative Protestants.

DA: You've talked about the surprise you threw at some readers in your *The Whys of a Philosophical Scrivener,* when you said you are a philosophical theist. For those who



Martin and the Mad Hatter in Central Park

don't know what the term means, you began to explain that this is a belief in a god, and you said in your case that prayer was a part of it, and that you believe in a hereafter.

Gardner: That's true, I do.

DA: What does your hereafter look like?

Gardner: You can't say anything about it at all. It's like talking about attributes of God. It's in a transcendental realm, and you just believe by hope and a leap of faith that there's that possibility, but you can't say anything about it in any detail because obviously nobody knows anything about it. I don't buy the mediums who communicate with the dead. There's no empirical evidence for it, and no logical proof, but the possibility is open. If there is a personal god, an after existence follows automatically if you think that God is just, because obviously nature doesn't care anything about human life. A thousand people can be snuffed out of existence by an earthquake. So to me, the belief in a personal god and belief in some kind of immortality is part of the same leap of faith. It's hard to have one without the other. But I certainly don't *know* that there is an afterlife, in the sense of having any kind of knowledge. It's a peculiar thing in my brain. It may even have a genet-

ic basis. Philosophical theism is entirely emotional. As Kant said, he destroyed pure reason to make room for faith.

DA: How long have you been a philosophical theist? Did it develop over a long period of time?

Gardner: Absolutely yes—it is a remnant I saved out of my Protestant past.

D**A:** I don't know if it's any comfort, but you're certainly back in Protestant country again, here in North Carolina.

Gardner: Oh yes, there are lots of Seventh Day Adventists around here. I was quite interested in the Adventist movement when I was in high school. George McCready Price, a prominent Adventist, convinced me that evolution was a false theory when I was in high school. I have a collection of his books. He wrote about 15 or 20 books.

DA: Of the sixty books you've done, some have sold very well—*The Annotated Alice* certainly has done well.

Gardner: Yes, it has sold more than a million copies if you include paperbacks and translations. It has never been out of print.

DA: How do you explain your fascination with *Alice in Wonderland*?

Gardner: I share with Carroll the following loves: mathematics, puzzles, formal logic, and conjuring. Carroll delighted in showing simple magic tricks to his child friends, and to take them to performances by magicians. More than any other books for children, his two Alice books swarm with logical, mathematical, and linguistic jokes. I did not discover the richness of this kind of humor in the Alice books until I was in my twenties, but since then I have felt a close kinship with Carroll.

DA: How about *Fads and Fallacies in the Name of Science*?

Gardner: This was an early book. It was remaindered by Putnam's, but Dover reprinted it and it has been one of their best sellers—still in print.

Pseudoscience—Worse Than Ever

DA: You continue to be involved with debunking pseudoscience and the paranormal with your work for *The Skeptical Inquirer* magazine. Two decades ago you expressed concern about the spread of pseudoscience and ideas about the paranormal. At the time you didn't think that things were getting better. This is 21 years later. Is it better?

Gardner: I don't think so, I think it gets worse and worse. The real damage comes to people who rely on alternative medicine, and don't go to a regular doctor. For example, instead they take a homeopathic dose, which doesn't do them any harm, but if they rely on it instead of going to a doctor, you get real tragedies. But alternative medicine keeps growing stronger and stronger, with more and more people involved. Homeopathic drugs are now in mainline drug stores, here in town (Hendersonville). Of course, you're buying nothing but distilled water, because they dilute it to the point where there aren't any mol-

Martin with Alice, one of his great loves, in Central Park

ecules left. The homeopathic dose is supposed to be the strongest when there's the least amount of the drug in the water. They keep diluting it so many times that the probability is very high there is not even a molecule left. So they have to claim that there's some sort of mysterious way in which the water *remembers* the properties of the drug. On college campuses, that's a big problem among students who go to homeopathic physicians. Of course the drugs can't do any harm, unless of course they're relying on them, and don't go to a regular physician for something really dangerous.

DA: They probably won't do any good either.

Gardner: Well, at least the drugs have a placebo effect. Now there's a big revival of magnetic therapy. I never expected this to happen. The use of magnets to cure all kinds of diseases was very popular in the nineteenth century. Magazines were filled with ads about magnetic devices, which you would wear under your clothes, in your shoes, and so on. *Parade Magazine* has run big ads for magnetic soles that you put in your shoes. They have little magnets in them, and are supposed to do all kinds of things to keep you healthy. Magnetic bracelets are popular, too.

DA: What other disturbing things of that sort are growing in importance?

Gardner: Well, there are psychics all over television, making lots of money. There are mediums now who will talk to your departed ones. They are appearing on numerous popular talk shows. Larry King had one on his show just a few weeks ago, a medium you can phone, and he will bring to you messages from your dead relatives.

DA: Larry King? I thought he was a bit better than that.

Gardner: Well, I'm sure he didn't buy any of it. But it's great theater.

DA: So your level of optimism is not very high.

Gardner: And, of course, UFOology is going as strong as ever. There are believers who have top posts at major universities, who are into UFOology, and write crazy books about it. It's hard to believe, but Margaret Mead believed in UFO's and wrote about how they were piloted by friendly extraterrestrials!

DA: What bright spots do you see out there?

Gardner: Oh, I don't know. *The Skeptical Inquirer* magazine may be doing a little bit of good in reaching media people and alerting them to the other side of the story. But I think it's a losing battle. It preaches to the choir.

Improving Mathematics Education

DA: Let's suppose we had a ministry of education, like many countries do, and you were placed in charge of education. What would be some of your top priorities?

Gardner: Oh gosh, I don't know. I believe in free speech, and I don't believe in muzzling a pseudoscientist. In the medical field, I would try to give more funding to the FDA, for they're almost powerless to stop all kinds of harmful drugs. Our local paper recently had a full-page ad for a weight reducing drug that actually kills people. It's based on a plant that grows in the Orient, and operates by expanding in the stomach when it hits water. The stomach, as it expands, gives you the feeling of fullness. So you don't eat as much, and that's how you lose weight. But the trouble is, it can expand in the esophagus, and people can choke to death. There've been a number of cases of people choking to death, taking this drug. By the time the FDA closes down one of these firms, they simply move to another town, and change the name of the drug. Whenever ads for such drugs appear in the local paper, I write a letter about it, saying the paper should not run such ads. The paper always runs my letters, but it has no effect on the advertising department.

DA: Money still talks.

Gardner: Yes.

DA: As education minister you'd have your say about math teaching in elementary schools and high schools. There certainly are some basic problems about adequate compensation of teachers.

Gardner: I think that's the key—to increase the pay of the teachers, to get some teachers that really know and love math. That's the big problem.

DA: When you were a kid you had a great teacher, Pauline Baker Perry. You dedicated one of your books to her, too.

Gardner: She was single when I was in high school, but then later she married the basketball coach. She was quite young and attractive then.

DA: But she was able to survive then, on a low salary.

Gardner: Right, and after she married I think she continued teaching until she died or retired.

I don't think much of the new-new math—the fuzzy math, as they call it.

DA: Have you looked at the new *NCTM Standards*?

Gardner: I haven't seen the latest. But I did a long article in *The New York Review of Books*, attacking a particular book. [The New New Math, *New York Review of Books*, Volume 45, Number 14, 1998.]

DA: A high school book?

Gardner: Yes.

DA: What about the materials that you have seen for school mathematics these days?

Gardner: The main idea of fuzzy math is to arrange students in small groups that cooperatively discover the theorems. You'll have a group of maybe seven students and instead of teaching them the Pythagorean theorem you'll have them cut out triangles and so on, and try to discover it themselves. And, of course, it gets the teacher off the hook. She doesn't have to do much teaching, she just lets the students fool around, and try to discover theorems. What happens is there is usually one bright student in the group who does all the work and the others go along. It may take them a week to discover the Pythagorean theorem. I think this is a big waste of time. Most studies show that the students in fuzzy math classes don't do very well in tests later.

DA: Part of the theory is that when you get into the real world, whatever that is, you'll be part of a group, a team, so you really need to learn how to work together, and problem solve collectively.

Gardner: Yes, I know, that's the theory.

DA: But I think you're right about the difficulties in kids really cooperatively putting this stuff together. I guess another aspect of this is that we're supposed to appreciate how this is going to really increase their motivation to learn the material.

Dinner with Gödel

DA: Let's move back to math for just a minute. You've lived long enough now to see a lot of really interesting mathematical ideas hit the scene, and there are also some really beautiful ideas that were here long before you were on the scene. First, during your own lifetime, what ideas, what discoveries just kind of knocked your socks off?

Gardner: Well, I think the most interesting developments are mainly in mathematical physics, and that's the development of superstring theory. That came as a complete surprise to me. It's a beautiful theory of particles, and it may or may not be true, but it's the

Martin with Scott Morris in 1981

hottest thing in town now in particle physics. It opens up the possibility that higher dimensions are not just artifacts but actually real. There was an article in the *New York Times* recently, on speculation that there are higher dimensions that are not even rolled up or coacted, but there's a lot of theoretical work going on now by superstring experts who view our entire universe as embedded in an infinite fifth dimensional space. In the past, speculation about higher dimensions has been crankish, by mystics, who were speculating 'oh, that's the transcendental realm in which God exists,' and so on. Now it's becoming a very real possibility in modern physics.

DA: Ed Witten, the high priest of string theory, was honored by the mathematical community in 1990 when he won a Fields medal. Mathematicians tend to be pretty careful in passing out Fields medals. He could end up with a Nobel Prize, too, which would be a rarity. But just the fact that he is a physicist winning mathematics' top prize is very impressive.

Gardner: He's made a lot of interesting new developments in knot theory. I don't understand it at all, but apparently knot theory now ties in with quantum mechanics in some mysterious way that I don't understand. A few years ago I went to a conference honoring Andrew Wiles. I went partly to hear Witten talk, and also to hear Penrose talk. I understood everything Penrose said and I understood nothing that Witten said. Absolutely nothing, not a single sentence. He kept talking about "loop groups," and I had never heard of loop groups before.

DA: So the most exciting developments for you have been in mathematical physics.

Gardner: Right.

DA: You've read a lot of contemporary material, and you've read a lot by those who have been gone a long time. Are there any of those departed people that you'd like to sit down with over dinner, or visit with in your library and chat with them?

Gardner: I'd love to chat with Gödel for example. He had some strange cosmological views, and I'd like to talk to him about that, about time travel into the past. I never could quite understand that. And of course he was a dedicated Platonist. He thought all of mathematics was out there, including the transfinite numbers. I'd enjoy talking to him about that. Of course I'd love to talk with Einstein and Neils Bohr. Among puzzle makers, I'd most want to talk with Henry Dudeney and Sam Loyd.

DA: They really rang your bell.

Gardner: I also would enjoy talking to Bertrand Russell. He's one of my heroes. I guess you could call him a mathematician.

DA: Absolutely. Look at his work on *Principia Mathematica* with Whitehead, and his *Introduction to Mathematical Philosophy*. He was a big influence on me when I was young.

Gardner: He was a realist in mathematics. He believed that mathematical objects and theorems have a peculiar kind of existence, not the same as that of stars and stones, but a reality independent of human minds and cultures. A prime number of, say, a trillion digits, is prime even if no one knows it is prime. Andromeda was a spiral nebula long before any humans observed it. I remember a statement he made once that "2 plus 2 is 4 even in the interior of the sun."

"I'm strictly a journalist."

DA: Here's an equally easy question for you. Once you've departed this life, let's suppose you had an opportunity to come back in a hundred years. What questions would you most want to know the answers to that might have been developed during that time?

Gardner: I guess I'd be interested to know if various famous unsolved problems had been solved, such as the Goldbach Conjecture. But I don't have any great desire to come back and learn what modern mathematics is up to. You're giving me credit for being more of a mathematician that I really am. I'm strictly a journalist. I just write about what other people are doing in the field.

DA: Well, I know you've said that many a time, but you actually have some mathematical papers to your credit, too.

Gardner: Yes, but they're low-level math. I do have an Erdös number of two, in a couple of ways, through Ron Graham and Frank Harary.

DA: Those are good links. When I posed the question, it didn't necessarily have to pertain to mathematics. For example, we might wonder if we are going to make it as a civilization?

Gardner: That's true. I would like to know if we colonize Mars, and if we found any evidence of life on Mars. Of course the most stupendous development would be, hearing from some extraterrestrial civilization. That would really upset everything. I have no opinion on that one way or the other, as to whether there is any intelligent life out there.

DA: Johnny Wheeler says, as you know, that the universe is a home for man.

Martin and friends

Gardner: That's right, Wheeler is one of those people who thinks that we are the only intelligent life in the universe. He bases this on the extreme improbability of life getting started. And he may be right.

DA: There's a new book that picks up on that notion, it's called *Rare Earth*. Peter Taylor and Donald Brownlee at The University of Washington—well respected scientists, who are really looking at the physical and chemical ideas that are so important to life as we know it. They rate the probability as low, but, of course, the qualifier is 'life as we know it.'

Gardner: That's right. Life could take all kinds of strange forms. Finding it on other planets would be the most exciting development that I can think of in the next 50 years. But I have no emotional feeling one way or the other. I'm content either way.

DA: I also want to ask you about your *Annotated Casey at the Bat*. You've annotated several famous poems, such as Coleridge's *Ancient Mariner***,** Carroll's *Hunting of the Shark*, and Carroll's *Phantasmagorie.*

Gardner: I had a lot of fun doing *Casey*, I dug up a lot of sequels to the poem, and I tried to weld them all together into a coherent story as if Casey really existed.

DA: How do you account for the popularity of some of these poems that are not in some case gems, but they catch on.

Gardner: Well, I've done two anthologies of popular verse for Dover. One was called *Famous Poems of Bygone Days*. I certainly don't think they're up there with Keats or Shakespeare, because I tend to be a classicist in the kind of poetry I most admire, but I do think that a lot of popular verse is more worth reading than some of the poets who have vast reputations. I'm very down on free verse. If a poem doesn't have some kind of melody, it doesn't have to be rhyme or meter, but if it doesn't have any music involved, well it's just prose broken into lines. So I have a very low opinion of William Carlos Williams and half a dozen other modern poets who I don't think write poetry at all.

A lot of people think that I have a very high regard for popular verse, above that of the great poets. That's not true, of course. But I would rather reread something by Byron or Keats than to read anything by Carlos Williams, I've never found one poem by him that I wanted to memorize. Anyway, I've done the two books for Dover, and in the introductions I sound off about my biases. I did another book of annotated popular verse, called the *Annotated Night Before Christmas*, now out of print. It's a collection of parodies and sequels that have been written about *The Night Before Christmas*. That poem and Casey, and maybe the *Old Oaken Bucket,* have been the most parodied American poems.

I've written a number of parodies myself. I have a parody in my *Casey* book titled, *Casey's Son*, it's attributed to Nitram Rendrag, my name spelled backwards. And I've got some other parodies that get published now and then. I have one in the current issue of *Free Inquiry*. It's a parody of *The Village Blacksmith*, about Ventura, the village wrestler. In 2001, Prometheus Books published *Poetic Parodies* a collection of parodies of famous poems. In this book, I have the original poem first, followed by one or more parodies of the poem. Almost all of them are in public domain; they're old parodies, of such favorites as Poe's *Raven*, the *Old Oaken Bucket*. Some are pretty funny. My parodies are credited to Armand T. Ringer, an anagram of my name.

DA: I look forward to reading it.

Martin Gardner
Defending the Honor of the Human Mind

Peter Renz

We expect Martin Gardner to amuse and delight us, but he does more. He teaches us to be critical. We must be at our best with him if we are to enjoy him and not be fooled. He raises questions without pat answers for the casual reader and for the expert.

Surprises

Martin is a conjurer. In his hands common objects take on magical properties. He works this magic with ideas — writing something about "Nothing" (February 1975) and covering "Everything" in a single column (May 1976). He has the magician's eye for the hidden and transforms base metal into gold, not with a philosopher's stone, but with a philosopher's mind.

The questions Martin asks are unusual and revealing. When the subject of extraterrestrial life came up in conversation, he asked what I knew of the physicist John A. Wheeler's views on this. Martin had read that Wheeler believed life exists only on Earth. To Martin, a flat statement on what seems a problematical subject suggests hidden reasons, perhaps linked to Wheeler's religious beliefs.

This is a Gardner twist. While I can't prove or disprove the existence of extraterrestrial life, I can learn what others think about extraterrestrial life and why.

Martin gives interesting and useful questions to think about, questions that sharpen our wits and our critical abilities, ones that develop our problem-solving abilities. Like Wittgenstein, Martin shows the trapped fly the way out of the fly bottle.

There is a question not covered in Martin's columns: Who is Martin Gardner, and how did he come to write the "Mathematical Games" column in *Scientific American*? Here are the answers to these questions in brief.

Who is Gardner?

Martin Gardner was born in 1914, the first of three children of Dr. James Henry Gardner and Willie Wilkerson Spiers Gardner. His father was a geologist, first with various state geological surveys, and later as a consultant and as president of his own oil company. The Gardners were of Methodist stock. Dr. Gardner was a director of the Tulsa Chamber of Commerce, active in the Audubon Society, a Mason, and a Democrat.

Martin's background combined fundamentalist faith with a strong commitment to science. His interest in magic began early, when his father showed him his first trick, the papers-on-knife trick. By his high school years he was contributing regularly to *The Sphinx*, a magazine devoted to magic. His high-school mathematics teacher, Pauline Baker Perry, first stirred what later became a lifelong interest in mathematics. He decided he wanted to study physics at Caltech. In 1932 Caltech did not have a program for the freshman and sophomore years, so Martin set off for two years at the University of Chicago, intending to transfer to Caltech later. This was a fateful choice. Robert Maynard Hutchins had recently become president of the university and a general education in humanities was required for the student's first two years. Thus, Martin did not take a single college mathematics course in his first years at Chicago. By the time he was an upperclassman, he was caught up in the excitement of the philosophy department at Chicago, with teachers such as Charles W. Morris and Charles Hartshorne.

During his undergraduate years at Chicago he struggled to reconcile the Methodist fundamentalism he was raised in with the rational scientific philosophy he found at the university. He made lasting friends at the university and among Chicago's magicians. His long spiritual and philosophical struggle is fictionalized in his 1973 novel, *The Flight of Peter Fromm*, a book that Martin roughed out in 1946 and 1947. The skeptical rationality he developed in this struggle has served him throughout his life.

In 1936 he graduated a Phi Beta Kappa in philosophy and, after a brief stint as a reporter for the *Tulsa Tribune*, he went to work in public relations for the University of Chicago. From 1936 to 1939, Martin also pursued graduate work in the philosophy of science at Chicago. In 1941 he enlisted in the United States Navy and served as a yeoman on a destroyer escort in the North Atlantic until the end of the war.

After World War II, Martin returned to Chicago and, aided by the G.I. Bill of Rights, resumed his studies. He attended a graduate course of Rudolf Carnap's on the philosophy of science, and began his career as a freelance writer. Writing and the philosophy of science are woven into the fabric of Martin Gardner's life. Years later he edited Carnap's *Philosophical Foundations of Physics* (Basic Books, 1966), republished as *Philosophy of Science* (Dover Publications, 1995), Carnap's book for general readers. This book is based on transcriptions of tapes of the course Martin took from Carnap.

As for writing, Martin Gardner began publishing in magazines devoted to magic in high school; he had worked as a reporter; in his work for the University of Chicago he wrote publicity material. He published his first book (on magic) in 1935. He began to write fiction for a number of magazines. Mathematicians will recall the story of the "No-Sided Professor." It appeared in *Esquire* and was been reprinted in Clifton Fadiman's *Fantasia Mathematica,* along with Martin's "Island of Five Colors." Few of Martin's stories from these years had mathematical themes.

About 1947 he moved to New York and made connections with magicians and writers there. Among these friends were the magicians Persi Diaconis and Bill Simon and the writer Gershon Legman, editor of *The Limerick*. It was Simon who introduced Martin to Charlotte Greenwald and was best man when Martin and Charlotte were married in 1952, by a judge who was also a magic buff. Persi Diaconis is a friend who, like Raymond Smullyan, shared Martin's interest in magic and mathematics over the years.

New York offers a writer the advantage of a superb research collection in its main public library. It was there that Martin did much of the research for his *In the Name of Science* (Putnam, 1952, revised as *Fads and Fallacies: In the Name of Science*, Dover, 1957). In New York, Martin was a staff writer for *Humpty Dumpty's Magazine* for eight years. He resigned only after he established his "Mathematical Games" column in *Scientific American* in 1957.

Mathematical Games

The stage was set for the appearance of the column. Martin's tough and amusing *Fads and Fallacies* showed him to be an armed and dangerous skeptic. His novel, *The Flight of Peter Fromm*, let him set his own ghosts to rest and go forth to dispatch those of others. His short stories showed his talents as an author. His years on staff at *Humpty Dumpty's* taught him how to deliver creative material on a tight schedule.

Important elements are yet to come. Although the "Mathematical Games" column in *Scientific American* is about to be launched, the main elements — *Scientific American* and mathematics — have not appeared. Martin's last formal class in mathematics was in high school. His training was in philosophy of science. He was a professional writer, not a mathematician or even a specialist in mathematical games. Martin had done an article titled "Logic Machines" for *Scientific American* in 1952, but that was ancient history. The turning point was his December 1956 *Scientific American* article "Flexagons." There may be links from his work in philosophy to his article "Logic Machines" and between the cut-and-fold features he did for *Humpty Dumpty's* and the article "Flexagons," but the new element that would drive Martin's column was to be his interactions with the people in the field. The flexagon article brought Martin into contact with mathematicians John Tukey, Bryant Tuckerman, and A. H. Stone and with physicist Richard Feynman. These names are the sorts of people whose work he would be drawing on once he began his column. Whatever the continuities, 1957 and his "Flexagons" article marked a shift. Gerard Piel of *Scientific American* was impressed by Martin's article and by the interest it drew. Gerry was also impressed by the popularity of the four-volume *World of Mathematics* (Simon & Schuster, 1956), edited by the magazine's book reviewer, the lawyer James R. Newman.

Piel asked Gardner if there was enough material on recreational mathematics to sustain a column. Martin said "Yes," and took on the job. The rest is history. Piel initiated *Scientific American*'s most successful feature, and Martin embarked on a new phase of his career. Martin assembled a library of recreational mathematics classics, including Ball's *Mathematical Recreations and Essays* and Kraitchik's *Mathematical Recreations*, and subscribed to a dozen journals related to mathematics. These resources would have been useless without Martin's passionate interest in understanding things and his ability to write clearly and amusingly about almost anything.

Over the years, Martin's library and files have become a legendary resource. Most of these files are in an archive at Stanford University, thanks to the efforts of professor Donald E. Knuth. However, neither a library nor files, nor even a network of informants can write an interesting column by themselves. Each month Martin faced the daunting task he did at the start, but with more material to choose from. Gathering material was less

of a problem, but the choices became harder. Martin always handled the work himself, with help from his wife in checking and proofing.

To explain arcane science or mathematics one must understand it. Because Martin is neither a mathematician nor a physicist, he had to learn the material before he wrote about it. You benefit from Martin's efforts to understand the subject, whether mathematics, physics, or the philosophy of science. You can be sure that Martin, the author of *Fads and Fallacies*, will have sifted out the nonsense—nonsense and careless thinking do creep into legitimate science. Finally, Martin made things clear, logical, and understandable, because these are the qualities distinguishing scientific knowledge from pseudoscience.

The Greater Gardner

So much for "Mathematical Games," what of Martin's other interests? In 1979 he had about thirty books in print. His *Annotated Alice* sold 400,000 copies in the fifteenth year after its publication. Forty years on, his *Alice* appeared in its "Definitive Edition." His writings range from articles in mathematics journals to books on science, philosophy, mathematics, literary criticism, and magic. He has written children's books, not to mention his many books on mathematical games. He helped establish the Committee for the Scientific Inves-tigation of Claims of the Paranormal, which publishes the *Skeptical Inquirer*, a voice fighting the rise of pseudoscience. These concerns are seen in Martin's October 1975 article in *Scientific American* on extrasensory perception, in his interests in magic, in his *Fads and Fallacies*, and in his books such as *Science: Good, Bad, and Bogus* (Prometheus Books, 1981) and *The New Age: Notes of a Fringe Watcher* (Prometheus Books, 1988), whose titles suggest a skeptic at work.

For many years Martin and his wife lived on Euclid Avenue (yes, Euclid!) in Hastings-on-Hudson near New York City. In January of 1981 they moved to Hendersonville, North Carolina, moving within that area twice before Charlotte's death in December of 2000. Martin remained in their house, busy with many projects, until he moved to Norman, Oklahoma late in 2003 to be closer to his son James, who teaches at the University of Oklahoma. His other son, Thomas, is an artist living in Asheville, North Carolina in 2004.

Now you know how the "Mathematical Games" column came to be, and how Martin Gardner was able to carry it off with no special training in the subject.

Into the Future

The search for clarity, understanding, and pattern drives mathematics, and Martin is committed to this search. His wit, humor, and a relentless devotion to the truth expressed in his many writings have set countless others on this same path.

Recreational mathematics is old stuff, dating back at least to the Rhind papyrus, 1600 BC. Martin's column linked recreational puzzles and cutting-edge developments in mathematics, computer science, art, and culture. He broke the stories of public-key cryptography, Benoit Mandelbrot's fractals, and John Horton Conway's *Game of Life*, and gave Douglas Hofstadter's book *Gödel, Escher, Bach* a great sendoff. Today, recreational mathematics is broader in range and appeal and it is a more lively subject thanks to Martin's work.

I am just back from the March 25 through 28, 2004 Gathering for Gardner (G4G6) in Atlanta, Georgia. Some 180 attendees brought wonders to share: geometric and kinetic sculptures, illusions, puzzles, magical effects, astonishing juggling, puzzling objects, logic and mathematics to explain paradoxes or demystify pseudoscience, wit, fellowship, and word play. The gift exchange yielded bags bulging with wonders: puzzles, illusions, descriptions of new ideas or games, fascinating things. Martin was there in spirit, and he is now working his way through his G4G6 gift bag. Now you can begin to work your way through *The Digital Gardner*, Martin's gift bag for us. You may get the itch. You may find yourself wrestling with these puzzles, building things, inventing new puzzles, or finding new solutions to old ones. This is only the beginning.

Peter Renz
Brookline, MA
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