"Mathematical Games" and Beyond: Part II of an Interview with Martin Gardner

Don Albers

Don Albers (dalbers@maa.org) is an Associate Executive Director and Director of Publications of the MAA. Many of his interviews with mathematicians have appeared in this *Journal* and *Focus*, and two collections have been published, *Mathematical People* with Jerry Alexanderson and *More Mathematical People* with Alexanderson and Constance Reid.

On October 21, 2004, Martin Gardner celebrated his ninetieth birthday. For twenty-five 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 many 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 produced more than sixty books, most still in print; many have been bestsellers. His *Annotated Alice* has sold over a million copies, and the fifteen volumes collecting his "Mathematical Games" columns have gone through several printings. All fifteen volumes have been digitized and are available from the MAA on a single CD entitled *Martin Gardner's Mathematical Games*.

In his ninetieth year, he has returned to Oklahoma, where he was born. He is in good health and full of energy. What follows is the second part of an interview conducted at his home in Hendersonville, North Carolina, in 2000 and 2001; the first part appeared in the May issue. Portions of this interview also appeared in the November 2004 issue of *FOCUS*.

DA: Your work with children's magazines continued to the mid-fifties. 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 "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 I was given a copy of Sam Loyd's famous *Cyclopedia of Puzzles* by my father. In later years I would edit two paperbacks of Loyd's mathematical puzzles for Dover. After Piel proposed that I do a monthly column, I rushed to the used books area of Manhattan to buy all the books I could find on recreational math. That was when I obtained my first copy of 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 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 courses in mathematics as well as write. To me, it's hard to imagine how a professional mathematician would have time to ever write a book. I had nothing else to do, except research for those columns, and write them up.

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 another thing to write something that's inspirational and a pleasure to read each time.

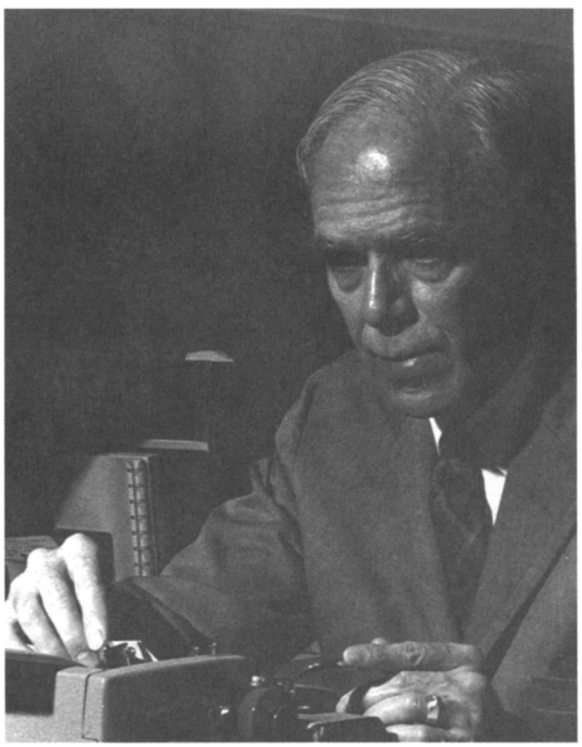

Figure 1. Martin creating another column

Figure 2. Martin receiving the Möbius Award for his article "Quantum Weirdness"

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 doing really 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 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 there are three feet in a yard.

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 minimum 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 $1, 2, 3 \ldots$ sequence—must have a number of sides that is a multiple of 8. (4) I devised a novel way to diagram the propositional 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. 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* 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 even today when students encounter *Life* 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 it's only a matter of about forty years 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. Moravic 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 supercomputers. The human race will become obsolete. The computers will take over, and then they'll start exploring space and colonizing the galaxy. He really believes it.

You know that the problem of consciousness is a hot topic right now. There have been half a dozen books on it 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 it will be only a short time until we figure out how the brain makes itself aware. But there is another school of philosophy coming into prominence, and I'm very sympathetic with it. 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 since 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.

We Mysterians think consciousness won't be understood for at least a long, long time. Also, Mysterians believe that self-awareness and free will are two names for the same thing. If you try to imagine yourself without being self-aware, 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 on it as I can. 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, sitting and wondering 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 for a fixed period."

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

Gardner: My wife Charlotte and I could take off in the middle of the week and go somewhere for a few days and come back. Then I could work all day Sunday.

Adam, Eve, and navels

DA: In 1979, you talked about retiring from *Scientific American*, 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 any longer. You said that there were other things that you really wanted to write about that you were afraid you would never 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. 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 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 gave a history of it, together with various opinions that theologians have had towards it.

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, Ignatius Press in San Francisco, because only a Catholic firm would have allowed me to annotate it. This is a fantasy novel, 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. 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 thoroughly recommend it.

Of course, Chesterton is most famous for his Father Brown books. There were six of them. The first was called *The Innocence of Father Brown*, and I later did an annotated edition for Oxford. I've also done introductions to a number of Chesterton's other books of fiction for Dover.

Another of my favorite authors is H. G. Wells. He and Chesterton were friends, and you can't imagine two people who were more 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, but 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, a Spanish philosopher, Miguel de Unamuno, who's not very well known.

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.

The Trap Door Spiders

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

Gardner: The count is rather vague because some of the books I've written are pamphlets and booklets in the magic field. You don't know whether to call them books or not, because they may be only fifty pages or so. But if you consider hardcover books, yes, it's about sixty.

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

Figure 3. Martin and friends at One Euclid Avenue in Hastings-on-Hudson

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

DA: No, please do.

Gardner: It started out as a group of about twenty science fiction writers, all male, and wives are not invited. Members take turns sponsoring the dinners. The person who sponsors the dinner gets to invite a guest. After the meal 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 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 in having 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 get 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.

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 in 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 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 still 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 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 just since 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 are 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 genetic 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.

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*?

Figure 4. Martin with Alice, one of his great loves, in Central Park

Gardner: I share the following loves with Carroll: 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 later 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 of 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. Is it any better now?

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. On college campuses, that's a big problem among students. But alternative medicine keeps growing stronger and stronger, with more and more people involved. Homeopathic drugs are now in mainline drug stores. Of course, you're buying nothing but distilled water, since it has been diluted to the point where there aren't any molecules 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.

There's also 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: 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 teachers who 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. I think she continued teaching after she married until she either 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.[1]

DA: A high school book?

Gardner: Yes.

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

Gardner: The main idea of fuzzy math is to arrange students in small groups that cooperatively discover 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 teachers off the hook. They don't have to do much teaching—they just let the students fool around trying 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.

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 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 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, but also to hear Penrose. I under-

[1]The new new math, *New York Review of Books* **45**:14 (1998).

stood 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 sit down here in your library and chat with?

Gardner: I'd love to chat with Gödel. 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 *Principia Mathematica* with Whitehead, and also 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 Erdős number of 2, 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.

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*, by 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 fifty 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, including Coleridge's *Ancient Mariner*, Carroll's *Hunting of the Snark*, 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 cases 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

Figure 5. Martin and Charlotte

any music involved, well it's just prose broken into lines. So I have a very low opinion of William Carlos Williams and 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 a recent 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 give the original poem first, followed by one or more parodies of the poem. Almost all of them are in public domain, 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.