

Appendix 1: Matching Wits with 'God'¹

If you think a problem that asks you to accept the possibility of the situation suggested by the above title is simply silly, that it poses a situation nobody with any serious intent would suggest (outside of theology, of course), you are wrong. In his *God and Golem, Inc.*, cybernetics guru Norbert Wiener (see the opening paragraph of Chap. 4) writes that “to play a game with an omnipotent, omniscient God is the act of a fool.” What we’ll do here, however, is not quite what Wiener had in mind.

In Chap. 1 I mentioned a book by the political scientist Steven Brams, in which he used two-person game theory to study the outcomes of an ordinary person interacting with an ‘opponent’ that possess the attributes of omniscience, omnipotence, immortality, and incomprehensibility. That is, he studied the interactions of a human ‘playing against’ what he called a ‘superior being’—or, if you wish, against God. In 1950 the mathematicians Merrill M. Flood (1908–1991) and Melvin Dresher (1911–1992), while working at The RAND Corporation in Santa Monica, California (an Air Force think tank), jointly created a game theory puzzle question that makes this very suggestion, and it has bedeviled analysts ever since. I’ll first describe it in its best-known, non-probabilistic form, and then again in the form that gives this appendix its title (and in which a small amount of *very* elementary probability makes an appearance). There is still no known analysis that satisfies everybody. Indeed, I suspect God, Himself, may be scratching His head!

The best-known version of the original Flood/Dresher puzzle is called the “Prisoner’s Dilemma,” a name given to it by Albert W. Tucker (1905–1995), a

¹ This appendix, in very slightly different form, originally appeared in my book *Will You Be Alive Ten Years From Now? and numerous other curious questions in probability theory*, Princeton University Press 2014. I thank PUP for permission to reprint.

Princeton University mathematician. Imagine that you and another person have been arrested and each of you have been charged with two crimes, one serious and the other not so serious. You've both vigorously claimed innocence, but are now being held in separate cells awaiting trial. There is no communication possible between the two of you. Then, just before the trial is to start, the prosecuting attorney from the DA's Office shows-up in your cell with the following offer.

There is sufficient circumstantial evidence to convict both of you of the not so serious charge, enough to get each of you a year in prison even if neither of you confess. But, if *you* will confess then the other person will be convicted of the more serious charge and get 10 years in prison *and you will be set free*. When you ask if the other person is getting the same offer, the answer is 'yes' and, further, when you ask what happens if both of you confess the reply is that then both of you will get 5 years in prison. The puzzle question is now obvious: what should your decision be, to confess or not?

To help keep all the conditions clear in your mind, the following table of your various potential fates should help:

Actions	Other person confesses	Other person doesn't confess
You confess	you get 5 years in prison	you go free
You don't confess	you get 10 years in prison	you get 1 year in prison

To make your decision, you might use the following standard game theory reasoning. The other person is either going to confess or not. It's going to be one or the other, and which it is has nothing to do with anything *you* can control. So, suppose he/she does confess. If you confess you get 5 years, and if you don't confess you get 10 years. Clearly, you should confess *if he/she confesses*. But suppose he/she doesn't confess. If you confess you go free, and if you don't confess you get 1 year. Clearly, you should confess *if he/she doesn't confess*. That is, you should confess *no matter what* the other person decides to do. For you to confess is said to be (in game theory lingo) the *dominant decision strategy*.

But here's the rub. The other person can obviously go through exactly the same reasoning process as you've just done, to conclude that his/her choice is also dictated by the dominant decision strategy of confessing. The end result is that you *both* confess and so you *both* get 5 years in prison! The 'paradox' is that perfectly rational reasoning, by each of you, has resulted in a non-optimal solution because if you both had simply kept quiet and said nothing, then you both would have gotten the much less severe sentence of 1 year in prison. Philosophers have argued (for *decades*) over whether this is really a paradox or merely 'surprising,' and the literature on the problem had, even years ago, grown to a point where nobody could possibly read it all in less than that 10 year prison sentence. And it continues to grow ever more voluminous even as I write.

It was while thinking about the “Prisoner’s Dilemma” in 1960 that William Newcomb (1927–1999), a theoretical physicist at the Lawrence Radiation Laboratory—now the Lawrence Livermore National Laboratory (LLNL)—in California, created an even more perplexing puzzle. Newcomb’s problem (now called *Newcomb’s Paradox*) was formulated to help him explore the “Prisoner’s Dilemma,” and it is now generally believed that Newcomb’s Paradox is a generalization containing the Prisoner’s Dilemma as a special case.

Curiously, Newcomb himself never published anything about his puzzle, but instead it first appeared in print in a 1969 paper by the Harvard philosopher Robert Nozick (1938–2002). The puzzle had been circulating via word-of-mouth in the academic community, but Nozick decided it needed a much wider audience. But what really brought Newcomb’s puzzle world-wide fame was when it appeared in the July 1973 “Mathematical Games” column of *Scientific American* (with a follow-up column in the March 1974 issue), written by the well-known popular math essayist Martin Gardner (1910–2010). So, here’s Newcomb’s Paradox.

Imagine that you are approached by an intelligent entity that has a finite but lengthy history of predicting human behavior with unflinching (so far) accuracy. It has, to date, never been wrong. You may think of this entity as (using Gardner’s examples) a “superior intelligence from another planet, or a super-computer capable of probing your brain and making highly accurate predictions about your decisions.” Or, if you like, you can think of the entity as being God. This entity makes the following presentation to you.

A week ago, the entity tells you, it predicted what you would do in the next few moments about the contents of those two mysterious boxes you’ve been wondering about that are sitting on a table in front of you. The boxes are labeled B1 and B2, and you can either take the contents of both boxes, or the contents of box B2 only. The choice is entirely yours. B1 has a glass top, and you can *see* that the entity put \$1,000 in that box. B2 has an opaque top, and you can’t see what, if anything, is in it. The entity, however, tells you that it put nothing in B2 *if* last week it predicted you would take the contents of both boxes, or it put \$1,000,000 in B2 *if* last week it predicted you would take the contents of only B2.

So, what’s your decision? Take both boxes, or just box B2 alone? The reason why this situation is called a *paradox* is because there are seemingly two quite different (but each clearly rational) ways to argue about what you should do—the two ways, however, lead to *opposite* conclusions! The first line of reasoning is similar to the one we used in the Prisoner’s Dilemma, in that it is a dominance argument. As we did there, let’s make a table of the various potential outcomes as a function of what you decide and what the entity predicted:

Actions	Entity predicted you'll take both boxes	Entity predicted you'll take only box B2
you take both boxes	you get \$1,000	you get \$1,001,000
you take only box B2	you get nothing	you get \$1,000,000

Now, the entity (you reason) made its prediction *a week ago* and, based on that decision *then*, either did or didn't put \$1,000,000 in B2. Whatever it did is a done deal and can't be changed by what you decide *now*. So, looking at the above table, it's clear that you have the dominant strategy of taking the contents of both boxes, as \$1,000 is greater than nothing (the entity predicted you'd take both boxes), and \$1,001,000 is greater than \$1,000,000 (the entity predicted you'd take only B2).

Okay, that all makes sense to a lot of people, maybe you, too. But—there is another, probabilistic argument that leads to the opposite conclusion. It goes like this. We don't *know* that the entity is absolutely infallible. Yes, it's true that it hasn't been wrong yet, but its track record *is* finite. So, let's say it has probability p of being correct and, since it has always been right up to now, it is almost certain that p is pretty close to 1 (but we don't know that it *is* 1). So, for now it's p . Now, in decision theory there is, besides the dominant strategy principle, another equally respected principle called the *expected-utility* strategy, in which you decide what to do by maximizing the expected utility that results from your choice. The utility of an outcome is simply the product of the probability of the outcome by the value of the outcome, and the expected utility is the sum of all the individual utilities.

So, suppose you decide to take both boxes. The entity would have predicted (correctly) that you would do that with probability p , and with probability $1-p$ it would have predicted (incorrectly) that you'd take only B2. So, the expected utility resulting from the choice of taking both boxes is

$$U_{\text{both}} = 1,000p + 1,001,000(1 - p) = 1,001,000 - 1,000,000p.$$

Next, suppose you decide to take only B2. The entity would have predicted (correctly) that you would do that with probability p , and with probability $1-p$ it would have predicted (incorrectly) that you'd take both boxes. So, the expected utility resulting from the choice of taking only B2 is

$$U_{\text{B2}} = 1,000,000p + 0(1 - p) = 1,000,000p.$$

Notice that as $p \rightarrow 1$ we have $U_{\text{both}} \rightarrow 1,000$ while $U_{\text{B2}} \rightarrow 1,000,000$.

So, the expected utility principle says you should decide to take only B2 *if* the entity is almost always correct. In fact, we can *very* loosely interpret what 'almost' means since as long as $p > 0.5005$ (the entity simply flips an almost

fair coin to make its prediction!) we have $U_{B2} > U_{\text{both}}$ and the expected utility principle says you should take only B2.

I think you can now clearly see the 'paradox' in Newcomb's Paradox. Two valid arguments, each eminent examples of rational reasoning, have led to exactly opposite conclusions. As Professor Nozick wrote in his 1969 paper,

"I have put this problem to a large number of people, both friends and students in class. To almost everyone it is perfectly clear and obvious what should be done. The difficulty is that these people seem to divide almost evenly on the problem with large numbers thinking that the opposite half is just being silly. Given two such compelling, opposing arguments, it will not do to rest content with one's belief that one knows what to do. Nor will it do to just repeat one of the arguments loudly and slowly. One must also disarm the opposing argument; explain away its force while showing it due respect."

Well, logicians, philosophers, mathematicians, physicists, and just plain folks have been trying to do that over the more than 40 years since Nozick wrote, and the noise and confusion continues to this day. What, you might wonder, did the *creator* of this puzzle think should be the choice? In a recent contribution,² the physicist and SF writer Gregory Benford (who once shared an office with Newcomb at LLNL and often discussed the problem with him, long before it became famous) revealed that when he asked Newcomb that very question the reply was a resigned 'I would just take B2; why fight a God-like being?' I read that as meaning Newcomb, too, was as stumped by his own puzzle as has been everyone else!³

This intellectual conundrum reminded Martin Gardner of one of the amusing little poetic jottings of the Danish scientist Piet Hein (1905–1996):

"A bit beyond perception's reach
I sometimes believe I see
That life is two locked boxes, each
Containing the other's key."

That might well be a good summary of most of the issues discussed in this book!

² David H. Wolpert and Gregory Benford, "The Lesson of Newcomb's Paradox," *Synthese* (Online First), March 16, 2011. There are a lot of references in this paper to the vast literature on the problem.

³ One writer who directly associated Newcomb's 'God-like being' with God was Dennis M. Ahern: see his paper "Foreknowledge: Nelson Pike and Newcomb's Problem," *Religious Studies*, December 1979, pp. 475-490. Ahern was at the time a philosophy professor at the University of Maryland, and Nelson Pike (1930-2010) was a philosophy professor at the University of California at Irvine. Ahern was responding in part to Pike's paper "Divine Omniscience and Voluntary Action," *Philosophical Review*, January 1965, pp. 27-46.

Appendix 2: (fantasy)

“Some Things Just *Have To Be Done By Hand!*”

I wrote this short-short in 1978, and submitted it to *Analog Science Fiction* as a possibility for the magazine’s ‘way-out’ page. Called “Probability Zero,” the name of that page is intended to let readers know that both the author and the editor (at that time, Ben Bova, *Analog*’s second editor after John Campbell’s death in 1971) know it isn’t science fiction but rather is *fantasy*. Bova bought the piece but, before he could print it, he left *Analog* to become the first fiction editor at a new glossy science fact and fiction magazine called *Omni* (started in 1978 by *Penthouse* founder, the late Bob Guccione). The new editor at *Analog*, Stanley Schmidt (who only recently retired in 2012) decided to use it in the 1981 *Analog Yearbook 2*, and that’s where and when it finally appeared. So, here it is, in very slightly altered form, with God, Himself, as the central character.

The Most Important Entity rubbed His temples in fatigue. There was just so damned much crap to put up with nowadays. The personnel paperwork was nearly overwhelming, even for a being with omnipotent powers. And a work force faced with zero turnover had a first-class morale problem. The younger ones knew there was no hope for advancement by the once-usual routes of death, retirement, or resignation. None of those events ever happened—here.

The telephone rang, and He answered in weary relief at the distraction. “Yes?”

“Sorry to bother you, Sir, but the main computers have a backlog in the RANDOM QUEUE for ten to the 183rd power decisions. Can you please service those requests right now?”

“Damn, are those bloody scientists on Earth doing their quantum experiments again!? You’d think they’d understand the Uncertainty Principle after all these years. Well, what is it now, an electron beam through a diffraction grating, or is somebody trying to locate an atom with zero error?”

“Both, and more, Sir. Those guys are really getting busy down there. Why, just as we’ve been talking here, the RQ has picked up ten to the 179th power more requests!”

The main computers couldn’t be allowed to overflow. Once, two or three thousand years ago (in Earth time), they had been unattended for several days (in His time), and the RQ had clogged up tight with ignored decision requests for determining the outcomes of random events. The resulting massive computer system crash had caused entire centuries (in Earth time) of strange, abnormal violations in His Laws of Natural Phenomena. It had been the time of magic on Earth, and the new wizards, sorcerers, and magicians had used it to their advantage in proclaiming themselves to be all-powerful. It couldn’t be allowed to happen again!

“All right, all right, hold your feathers smooth. Hang on for a moment.” He put His caller on hold, and pulled open the desk drawer next to His perfect left foot. Inside was a pure diamond crystal box, containing two ruby cubes of ultimate clarity. The dots on the cube faces were precise circles of gold. The cubes were perfectly balanced, of course, as it was impossible for anything unfair to exist—here. Taking the cubes in His mighty hand, He established a mind-link with the input-output data lines to the main computers. Faster than imaginable (or even possible by ordinary laws, but for Him very little was impossible) the cubes tumbled in His quivering hand. The whole thing was over in just a few wing beats. He dropped the cubes, now so hot they glowed in the gamma-ray region of the spectrum, back into their crystal box, and shoved the drawer shut with a kick from His perfect left foot.

“Okay, the main computers cleaned up?”

“Yes Sir, the RANDOM QUEUE is empty!”

“Excellent—now please don’t call again for at least another day. Meanwhile, you and your colleagues might busy yourselves with finding a way to speed up the automatic software random number generator. I find this business of hand-generation to be increasingly inconvenient. Good-bye.”

As He hung-up, He thought of what Albert Einstein, one of the better Earth scientists, had once said: “God doesn’t play dice with the Cosmos.”

“Hummmph,” He grunted in disgust to Himself, “just what the Hell did *he* know about it?”

“The Next Time Around”

This second fantasy short-short, dealing (I suspect most people would say) in a pretty irreverent way with reincarnation, was written in a single sitting in 1979, as a break from a late-night session of exam grading. I was already sort of mentally unbalanced when I started it, from too much bleary-eyed reading of equations scrawled in dull pencil, and perhaps the story reflects that. Nevertheless, I had a lot of fun writing it and so I sent it to some of the big name SF magazines: *Isaac Asimov's*, *Omni*, *Analog*, even *Playboy*. No takers, but Stan Schmidt at *Analog* wrote back to say that while he liked it, it was just a bit too much “Twilight Zone” for *Analog's* readers. Well, now, *that's* a thought, I remember thinking, and so off it went in the next mail to T. E. D. Klein, the editor (from 1981 to 1985) of *Rod Serling's The Twilight Zone Magazine*. Much to my pleasure (and relief), he bought it. In a funny little note that he wrote in his offer (I still have it), he told me he was in the same sort of situation I had been when I wrote: “It's past 4 a.m. now, I'm still in the office and—feeling unusually efficient—I'm taking the risk of offering you, right now, the enclosed contract . . .” The story appeared in the August 1981 issue of the magazine, with Klein's editorial lead-in reading “When you're speeding down the highway at 70 m.p.h., what better time to think about life . . . and death?”

Rollo Adams pulled out of the motel parking lot just before dawn. It was best to hit the smooth, hard pavement of the superhighway while the air was still cold and the concrete slightly wet with dew. The souped-up convertible accelerated quickly and smoothly to 70, and Adams settled in for the last long day of cross-country travel.

As he watched the flat emptiness of the Arizona desert flash by, he felt the wind blow over his tiny bald spot. The old carcass sure did ache! His left side still hurt where the vandal had kicked him yesterday. If somebody hadn't come along just then, the bastard probably would have stuck him with a knife. Damn him! He tried to forget the discomfort by thinking of his destination—the romantic waterfront of San Diego Bay.

The car backfired once, and he wished he had a tachometer so he'd know how many RPMs he was pulling.

The miles pounded by, and Adams—who, as usual in the morning, had felt worn-out, down, deflated—began to feel a good deal better. The heat of the drive smoothed his stiffness away, and his grip on things was becoming firm again. Thank God the episodes of nausea and dizziness were getting less frequent and severe! For a while he'd been wandering, slipping a bit, but he

was gradually gaining experience, and he could handle the pressures of his new life better now.

And what pressures! At first he'd been almost paranoid about it, always on the watch for danger, never knowing when he might get drilled full of holes! He'd watched all the usual cops and robbers shows on television, sure, but that was just recycled Hollywood fantasy. Now, he *really* knew what it meant to be on the run for the rest of his life.

But the thick steel belts he wore around his vital areas reassured him. With body armor like that, it'd take a mighty big slug to rip *him* open! He had a lot of miles of experience on him now. He'd survived some pretty rough banging around these last few weeks, and had learned how well he could bounce back. He'd been pleasantly surprised. He knew he wouldn't blow and lose control. He was tougher, more resilient, than he'd thought.

The road ahead was empty, a ribbon running long and straight to the horizon, and so he let his thoughts drift back to last month, when he'd experienced the most traumatic event in his life. Man, the only creature on earth to be aware of the inevitability of his own death, still learns to cope with it. But it's one thing to read of the passing of a stranger, or even of one casually known; it's another when death strikes closer to home and snatches away your wife.

A giant wave of loss swept over Adams as he thought of Sally. God, how he missed her! He sighed quietly to himself as he recalled how the two of them had often joked about what came after death. Crazy things, like coming back as some other person. Sally had always said she wanted to return as a lizard and bake all day on a rock in the sun; she had never liked the cold winters in New England. Adams had chuckled at the thought of his elegant wife sitting on a rock eating flies. When he'd mentioned this to her, she'd frowned momentarily and then declared that it didn't matter, because once she was a lizard she'd *like* flies!

Half hypnotized by the rhythmic undulation of the road surface, and with nothing else to distract him, Adams continued to remember. He recalled how Sally had laughed at him when he'd suggested that she might come back all right, but not as a lizard. Maybe she'd come back as the rock! That would be okay, too, she'd replied, tears of silliness running down her face, just as long as she could roast in the sun!

Rollo Adams prayed with all his will that his wife had been granted her request. She had been so young and beautiful to die in that plane crash; he hoped that her wish had come true. And maybe it had! After all, weren't there religions that said you came back as a higher form if you'd led a virtuous life, and a lower one if you hadn't been so good? Who was to say if a lizard, or even a rock, was higher or lower than man?

Perhaps things had worked out for her; perhaps not. They certainly hadn't for him. Maybe those three or four one-night flings a few years ago were the

cause of *his* fate. He'd worshipped Sally, and those few moments of weakness still shamed him. He felt the urge to weep, and almost came undone right there. But then his new strength saved him. He had learned, over the past few weeks, to hold everything inside. To let it all out now would be disastrous.

Rollo Adams, dead in the same crash as Sally, roared down the highway. Instantly responsive to the rear-axle, high-torque differential shaft that spun him, he gripped his sporty rear magnesium rim, dug his zigzag slip-proof treads into the road, and felt the pavement rush past beneath him. The road stretched ahead in the hot sun, and San Diego beckoned.

I wrote "The Next Time Around" as simply a light-hearted take on resurrection. At the time I had not yet read "Riverworld," a story published 12 years earlier (January 1966) in *Galaxy Science Fiction* magazine by Philip José Farmer (1918–2009). "Riverworld" is a much more serious treatment of resurrection (it's difficult to think of one *less* serious!), opening with Tom Mix (a real-life cowboy movie actor who was killed in a 1940 auto crash in Arizona) in a boat, fighting for his life. Mix, along with 25 billion other humans from all across the ages, was resurrected 5 years earlier on "All Souls' Day" by some mysterious process. All were scattered along the shores of a river ten million miles long, and so we are clearly not on Earth. The only thing that seems evident is that they are all in a place "built by sentient beings," but whether that includes God or not is left unanswered.⁴

One of Mix's companions is slowly revealed to be Jesus who, understandably shocked by how different his resurrected life is from what he expected it to be when he hung on the Cross, has renounced his religion. When Mix, near the end of the story, is about to be burned at the stake by a resurrected but unrepentant fifteenth century Inquisitor, Jesus tells Mix "There was a time when I might have rid you of your pain . . . But no more. You have to have faith—and now I do not have it." This is far grimmer stuff than is "The Next Time Around"!

⁴ This question was eventually answered in Farmer's 1971 novel *To Your Scattered Bodies Go*, which is a vast expansion of the 1966 short story. It wasn't God who created this astonishing world, but rather a race of superior beings. Farmer's fictional creation might seem to be pretty amazing, but at least one reviewer was not impressed: see Franz Rottensteiner, "Playing Around with Creation: Philip José Farmer," *Science-Fiction Studies*, Autumn 1973, pp. 94-98.

Appendix 3: “A Father’s Gift”

I’ve included this third story of mine for two reasons. First, of course, as an example of ‘religious’ *science fiction* as opposed to *fantasy* (see the first two appendices), but also because it illustrates how even a ‘non-believer’ (see my opening and closing comments in Chap. 1) should not be constrained by personal bias when writing SF. I write this because the story imagines the scientific conversion of a skeptic (that’s me, I admit it!) concerning the divine origin of Jesus.

The story has the following history. It stars an archaeology professor who succeeds beyond his wildest dreams while on a quest for a religious artifact. Sound like an obvious rip-off of Indiana Jones? I hasten to remind you that the first Indy film was released in 1981, while the story was written in early 1979 and appeared in print in the August 1980 issue of *Omni*, a year *before* the film. Years after, in October 1993 and both a movie sequel and a prequel later, I learned that Steven Spielberg and Harrison Ford had agreed to do a fourth installment of the Indy saga as soon as a suitable script could be developed. So I wrote to my then agent in Los Angeles to suggest that he approach Spielberg with “A Father’s Gift” as a starting point. After all, the earlier films had told of Indy seeking the Ark of the Covenant and the Holy Grail—the tomb of Christ seemed a logical ‘sequel quest’ for a religious artifact.

Alas, my agent soon wrote back to say I was too late, that Spielberg had already settled on a concept (which, however, didn’t appear in theaters until fifteen—*fifteen!*—years later; who says Hollywood could outrun a snail?). I did later get a couple of movie-deal nibbles, but about 99 % (or more) of Hollywood film nibbles go nowhere, and mine were no exception. But I still think the story could be expanded to make a great adventure film. (*Of course* I’d think that, what author wouldn’t?)

As the *Omni* fiction editor (Ben Bova, recently arrived from the editorship of *Analog*) headlined the story in the magazine: “*It was the greatest discovery of*

the ages: all he had to do was open the coffin.” And then, when just a couple of years after the story first appeared I read of how Pope Paul VI had, in 1968, officially endorsed the ‘discovery’ of the remains of St. Peter (not Jesus, of course, but pretty close), well, in the immortal words of baseball legend Yogi Berra, it was *déjà vu* all over again!⁵ Since the relationship between the Church and the issue of religious relics—the ‘discovery’ of which became a big business in the Middle Ages—has always been one bordering on embarrassment (consider, for example, the well-known case of the Shroud of Turin⁶), this was no small announcement. In any case, what follows in “A Father’s Gift” is a tale of the greatest possible—on Earth, at least—religious find of all.

I have found Christ. No, no, don’t say, “Oh, one of *those* people!” Please, hear me out. I’m no zealous religious convert, no fanatic, not even a fallen politician seeking public absolution for misdeeds in office. I’m a hard-science computer archaeologist on the staff of a well-known American university, specializing in the analysis of X-ray axial tomography of the mummies of Egyptian pharaohs. So when I say I’ve found Christ, I mean I’ve *found* him.

And something else.

I’ve never been a devout man. That’s led to some interesting discussions over the years with my brother, Jack, who’s an associate professor of ancient Middle Eastern languages at Georgetown University. A scholarly Jesuit, Jack had long ago kindled in me a fascination for Jesus Christ the teacher. Can anyone doubt what a truly remarkable man He must have been? But I’ve never been able to accept the Church’s dogma that He was the Son of God, the Savior here on Earth as the result of the Virgin Birth. And who, through the Crucifixion, suffered for the sins of all men. Up to now, I haven’t been able to believe, that is. Now—well, let’s just say I’m not so sure anymore.

We actually know so little about the life of Jesus, with what we do have coming only from the somewhat confusing, contradictory four Gospels. We do, however, have a fairly good idea of the political times. It was the reign of the murderous King Herod (of whom Caesar Augustus once said he’d rather be a pig than a child in the House of Herod!), the Jews were oppressed by Rome, and the Children of God were eager for the coming of the Messiah long predicted in the Old Testament. The times were ready for a Savior, and Jesus Christ was the right man in the right place at the right time.

⁵ John Evangelist Walsh, *The Bones of St. Peter*, Doubleday 1982.

⁶ Ian Wilson, *The Mysterious Shroud*, Doubleday 1986.

There is little dispute by scholars that Jesus was absolutely certain of His role. His life was no fraud, no shameful act of a charlatan. No actor could have suffered as He did. Some say He left us with His image on the Shroud of Turin and nothing else. They say that He died and disappeared forever.

Or did He?

A number of respected Bible scholars (a minority, yes, but still a significant number) have questioned the traditional description of the death of Jesus, primarily because of their skepticism about the Resurrection. I must admit, that has always been the stumbling block for my willingness to believe, too. Since I am an Egyptologist interested in funerary procedures, the death of Christ has fascinated me for years. It had always seemed to me that there just *had* to be an alternative explanation for what *really* happened. And I was right.

It all started some years ago. While in Cairo at the Egyptian Museum, I was studying dental X-rays of their collection of royal mummies as a sabbatical research project. It was there that I met a brilliant, intense man named Gamal el-Zam, now deceased. He was a professor of philosophy at the University of Alexandria and was also on sabbatical leave at the museum's antiquities department. I became friendly with Professor el-Zam, and soon we were discussing our various research activities. Somehow the discussion got around to my interest in Christ and my conviction that His death was still a mystery, no matter what the Bible may actually say on the matter. I recall he stared quizzically at me for a few moments, and I could see that he was debating in his mind whether or not to pursue it. He must have sensed the depth of my interest, because he plunged on.

"So, my friend, you are a doubter, are you? Good! Possibly, then, you will find some papers I have curious reading. There is great uncertainty about their veracity, as I believe they are actually a transcript of a lost part of the Apocrypha in St. Jerome's Vulgate. The Catholic Church rejects them. But who is to say—if you are as interested in pursuing the details of Christ's death as you seem, then maybe they will be of help. But I warn you, you may be getting into more than you bargain for."

What he actually gave me weren't the ancient manuscripts themselves. The original documents have long been lost, and it was photocopies of these rediscovered manuscripts that Professor el-Zam had, including the papers he suspected would interest me.

After Christ was taken down from the Cross on the hill of Golgotha outside Jerusalem, His body was, according to the evangelists, taken by the wealthy Joseph of Arimathea to a nearby tomb cut in rock. After that the body disappears, and Gospel records become what unbelievers call myth, with the story of the Resurrection 3 days later, and the ascent into Heaven after 40 additional days. Of course, the Gospels are shaky on this point, too, since Luke also says Christ went up to Heaven on Easter Day, well before the 40 days were ended.

That there are 40 days between the Resurrection and the Ascension has always fascinated me, because Genesis itself mentions this as the usual time required for embalming. Could it be that the followers of Jesus spirited His body away from the rock tomb to prevent its defilement by the Romans, who might have buried it in a common criminal's grave? Could it be that a select adherent embalmed the body of the Messiah and then secretly buried it?

The long-lost records given me by Professor el-Zam gave me the answers. Among them was a letter from Joseph of Arimathea to a man named Tertulian, apparently a close friend. First swearing him to secrecy, Joseph then describes the real fate of Jesus. The letter was in the ancient dialect of the common masses, Galilean Aramaic, which I could read only with great difficulty. Making an exact hand copy of the letter, but carefully deleting all references to Jesus by name, I sent it to my brother, Jack, over in America. My wait for his reply was agonizing. It came 3 weeks later:

Greetings to my beloved, but unrepentant brother! The strange text (*where did you find it?*) you recently sent was most challenging. I enjoyed the mental exercise, but it has left me somewhat perplexed. When you return to the States, I want to have a long talk with you about it. But, in answer to your request, here is my version of the original:

“And we bound his body in fresh linen and sealed his wounds. To secret its final fate, it was taken by night to a faithful follower, also a practitioner of the ancient art of preservation of the Egyptians. There it was purified, covered in soft lead sheets, wrapped in bandages, and sealed into a box of the Pharaoh. Transported overland to the Nile River, it was then sent by boat to the south, to the Temple of the Four Kings. There it was buried, safe at last from the Romans.”

As I read these words—words I had translated crudely myself but now was sure were right—I could barely contain my excitement. Jesus had been embalmed, and His body was mummified and then secretly shipped to Egypt and buried. But what was even more incredible was that I also sure the coffin was no longer at its original site, I was also sure I knew where it was. Right where I sat, in the Egyptian Museum itself!

But I wasn't the only one to see these new documents. Had anyone else reached the same conclusion as I? A conversation I had with Professor el-Zam, the day after getting Jack's translation, put my concern to rest. He was then about to return to Alexandria, and he inquired about my reaction to the photocopies he'd given me.

“So, my friend, what do you think about those ancient documents, now that you've had the opportunity to examine them?”

I answered carefully. Just how much did the professor know? “Gamal, they're fascinating. But one letter among them is *most* fascinating; the letter

from Joseph of Arimathea to Tertullian, concerning the events after the Crucifixion. Have you read that one, Gamal?"

"Oh, yes. Interesting to *you*, no doubt, because of your curious fixation on the death of Christ. But surely it cannot be authentic. After all, the expense of shipping such a coffin so far would have been enormous."

"Yes," I replied, "but Joseph was a wealthy man. He could have afforded it."

"I suppose, I suppose. But even if it is true, it must remain conjecture. After two thousand years, buried anywhere in thousands of square kilometers of sand, the body of Jesus will have returned to the earth long ago. We'll simply never know. So, my friend, you now have another mystery to haunt you!"

I remained silent. The strange look that must have been upon my face no doubt was interpreted by the professor as disappointment. But it was nearly uncontrolled thrill. Because I knew the professor was wrong.

He was wrong because I knew the recent history of the Temple of the Four Kings, while he was thinking only in terms of the past. The temple is more correctly called the Temple of Abu Simbel in Nubia, about 1,100 km south of Cairo at the archaeological site of Gebel Adda. In 1960, when Nasser announced the plans for the Aswan High Dam, it was immediately recognized that the resulting floodwaters would drown Gebel Adda forever. A hurried salvage operation was thus started, desperately trying to save what could be saved in the short time left. Among the artifacts recovered were more than 5,000 human skeletons, and several ancient coffins, all of which were hurriedly cataloged and shipped to Cairo. The skeletons have since been extensively studied for bone and dental evolution.

But not the mummies. Considered as just more Egyptian mummies among many already carelessly scattered in a back room of the museum's second-floor gallery room, they had been mostly ignored, as it was standard policy of the museum not to unwrap any mummy unless such a procedure was part of an ongoing scholarly study. But all incoming mummies *were* subjected to a routine X-ray scan, which was then filed. On my arrival at the museum, I had been allowed to go through these archived scan pictures as part of my orientation. One set had briefly caught my attention. The young woman in the records office had been unconcerned, however, about the problem.

"Miss," I recall saying, "this group of pictures is foggy. It almost looks like an underexposure."

"Oh," she replied, glancing quickly at the file in my hands, "it looks more like the plates weren't properly aligned. The X-ray gun is placed on one side of the coffin, you know, and the film on the other, and —"

“Yes, yes, thank you. I am familiar with the technique.” I put the file back and forgot it. The explanation seemed perfectly plausible at the time.

But as I sat silent before the professor I *knew* what the real answer was. The film had been aligned properly, all right. But the mummy inside was wrapped in lead! Just as that ancient letter by Joseph of Arimathea had said. The body of Jesus Christ was inside that coffin—I was sure of it!—resting in a dusty storage room not more than 100 m from my office!

How can I convey to you the excitement that charged my mind? I knew I had found the ultimate link between the modern world and the world of a man who had changed the course of history. There *is* no way for you to understand—I was like one overwhelmed by passion. I was to be the first man in twenty centuries to gaze once more upon the features of the Messiah, Jesus of Nazareth.

The arrogance, the blasphemy of that desire, shames me now as I sit here in America recalling that incredible instant of revelation. But at that moment the lure was irresistible. It had to be done in secret, of course—how could I possibly go to the museum authorities as an outsider, an American on a temporary visa, and tell them they had Jesus Christ in their storage room? They would quite properly have had me locked up for observation. No, I had to do it alone.

A week after receiving Jack’s letter, under the pretense of working late, by the stroke of midnight I was the sole inhabitant of the second-floor gallery. Armed with a crowbar, a flashlight, and a heavy scissors, I made my way to the storage room. My heart was about to burst, my mind was reeling. I felt it was the greatest moment of my life.

I had looked up the catalog number of the coffin with the foggy X-ray plates and, after about 20 min, I found it. I was in a dark corner of the room, covered with old packing crate materials and a layer of dust a few centimeters thick. It hadn’t been touched in decades. I soon had the coffin cleared away and began to pry the lid off with the crowbar. It was sealed solid with the ages, but my wild excitement gave me the strength of ten men. I had the lid off!

Before me lay a mummy, wrapped in the usual bandages, apparently no different from any of the dozens of other mummies scattered about the museum. I picked up the scissors. But then I looked more closely. In the dim light of the dusty corner, I had at first failed to notice that the bandages were charred, almost burned. And they had a dull-gray glint to them, as if they had been sprayed with metallic paint. As I gazed in wonderment at the strange sight, the scissors slipped unnoticed from my hand. In awe, I stood frozen, unable to move. I felt I was in the presence of something that should be left untouched. But then, using the flashlight, I spotted an object lying free in the coffin. As I gazed at what I retrieved, a deep feeling of intrusion swept over me again even more intensely.

At the foot of the ancient sarcophagus, nearly out of sight, I had found something that Joseph had failed to mention in his letter. The Roman procurator of Judea, Pontius Pilate, as a mocking thrust at the chief priests who had condemned Jesus, had had a placard bearing the charge against him nailed to the Cross. Joseph had removed the notice from the Cross, along with Jesus, and placed it in the coffin to bear witness to the identity of the man it accompanied into eternity. Since it is written threefold, in Greek, Latin, and Hebrew, there is little doubt in my mind whose blood it was that still lies splattered across the ancient sign:

JESUS THE NAZARENE
KING OF THE JEWS

I slowly replaced the lid, nearly overcome with emotion. Had I gone too far, pushed scientific curiosity beyond reason into a region where it had no business intruding? I returned to my office, carrying the bloody sign, wrapped in my agonized thoughts.

But still, I couldn't let it be. I recall I stared at the sign for hours, there in the gloomy quiet of my office. I *had* to learn its secrets.

The blood. It is all that is left, the only physical remains of Christ's body that I had—except for the mummy, which I didn't have the courage to free from its wrappings. Once again I wrote to America, this time to ask a friend in the pathology laboratory of the medical school at my university, an expert in forensic medicine, to run a total blood analysis on a fragment of wood I 'happened' to have. Of course, I told him nothing of its origin! I don't know what I expected to learn, but I couldn't help myself. I was so close to understanding the mystery that had haunted me for so long (or so I thought) that I just couldn't leave it alone. And the blood was all I had.

I soon had my friend's report. Halfway through it I had to put it down in shock. It couldn't be! But if it is so, then what could God have intended by allowing His Son to be so cursed? The lab analysis stated the presence of a large number of distinctly malformed lymphocytic cells, absolute, positive diagnosis of lymphosarcoma. Today we'd treat it with amethopterin and 6-mercaptopurine, with the usual result being total remission, possibly lasting as long as 5–7 years. Two thousand years ago, however, it would have been a virtual death sentence, with a survival time of mere weeks.

If Jesus had not died on the Cross, He'd have been dead within 2 months anyway. Or so I thought when I read the analysis. Such a death would have destroyed the perception of Him as the Messiah in the eyes of His followers. So, in that sense, the Crucifixion came just in time. But why the acute leukemia? Why a disease of imperfect man in the body of the Son of God?

The last half of the blood analysis had a second surprise for me, one presenting a riddle that in its own way was even more profound than the first. My friend's delicate chemical tests had also detected the presence of certain toxic blood reaction products—end-stage products produced only by the synthetic drug treatment for leukemia, 6-mercaptopurine, as if He had been on chemotherapy and was beginning to suffer a relapse just before His execution.

I sat stunned, numb with disbelief. It was all so incredible. I pulled open my bottom desk drawer, the one I always kept locked since hiding the sign away in it. As I held the old wood in my hands, I began to doubt. Was the sign really old, or was it all just a fantastic hoax? Was Professor el-Zam merely making me the butt of an elaborate, cunning, terrible prank? I knew then what I had to do, what I must do, if I was to know another moment free from confusion.

I had to open the mummy!

The very next night found me again in the storage room. I was now almost in a fever pitch of excitement and had the coffin lid off in just a minute or two. I attacked the oddly metallic, burnt bandages with my scissors. But what!—the ancient cloth fell apart at the thrust of the blades. What revealed itself to me was so astounding I dropped the scissors and staggered backwards. When I had begun to cut, the cloth had been of the form of a heavily wrapped figure. But as it separated under the force of the blades it fell in on itself, as if it contained nothing but space. And indeed there were no bones, nothing to mark the resting place of a man. But there *was* something there. A congealed, roughly spherical ball of lead!

It had to be the lead sheets, the soft lead foil mentioned in Joseph's letter. I stood paralyzed by both wonderment and surprise. There was no doubt now, this *was* the coffin of Jesus. But—where was He?

Slowly, the connection between the charred bandages and the melted lead sheets became clear in my bewildered mind. Something had caused the temperature of the covered body to reach at least the temperature of molten lead—328 °C. If the heating had occurred in just the right way, the surface tension of the liquid metal would have pulled it into a sphere. And lead mist would have impregnated the charred bandages, causing the fogging on the x-ray plates that I saw. I thought to myself: *It would have taken energy, wouldn't it—a lot of energy—for Him to return to His Father!*

The mystery that had bedeviled me for so long was finally resolved. The bloody sign, with its incredible tale, and the ancient coffin, had shown me the way. When dying on the Cross, Jesus had cried out in agony, "My God, my God, why hast thou forsaken me?" If only He could have known then, in His moment of extreme anguish, that His Father had *not* abandoned Him, but had given Him the gift of life beyond His natural time on Earth.

As my thoughts dwell on my discoveries, and as I think of the compassion of the Lord God Almighty for His Son, I feel comfort and warmth. I feel at real

peace with myself for the first time in my life. I didn't do wrong in pursuing the riddle.

I *have* found Christ.

If you find "A Father's Gift" to be borderline outrageous (which was, in fact, my goal when I wrote it—as well as projecting, just a bit, the excitement of a 'scholarly hunt'), well then, your brain will positively overheat and perhaps even *melt* if you read a book written decades later by authors who claim they have found the Tomb of the entire Jesus clan: *The Jesus Family Tomb: the discovery, the investigation, and the evidence that could change history* by Simcha Jacobovici and Charles Pellegrino, HarperCollins 2007. The well-known film producer and director James Cameron, of *Titanic* fame, wrote a quite literate Forward to the book and, since he once lived in the same small Southern California town that I grew-up in (Brea), I was initially inclined to give the book a good read. Yes, I know, not a lot of correlation there, and so you should read it and make-up your own mind about its merits.

Appendix 4: “Applied Mathematical Theology”

Published in *NATURE*, March 2, 2006. Copyright 2006 by Gregory Benford (reprinted by permission of the author)

The discovery that the Cosmic Microwave Background has a pattern buried in it unsettled the entire world.

The temperature of this 2.7 K. emission left over from the Big Bang, varies across the sky. Temperature ripples can be broken into angular- coordinate Fourier components, and this is where radio astronomers found a curious pattern—a message, or at least, a pattern. Spread across the microwave sky there was room in the detectable fluctuations for about 100,000 bits—roughly 10,000 words.

Although different technical civilizations in our Universe would see different temperature fluctuations, they could agree on the Fourier coefficients. This independence of place, and the role of the cosmic background as cosmic neon sign for anyone with a microwave receiver, meant that any intelligence in the Universe could see this pattern.

But what did it mean? Certainly it would not be in English or any other human language. The only candidate tongue was mathematics.

Writing them as binary numbers, astronomers tried to fit mathematical sequences, such as the prime numbers, in any base. This and other mathematical favorites—pi, e, the golden ratio, the Riemann zeta function—proved futile. More obscure numbers and patterns, from set theory and the like, also shed no light.

In despair, some thought the pattern might be random. But the Shannon entropy test showed clear non-random elements, and this nihilist idea faded away. One insight from Benford’s Law, which states that the logarithms of artificial numbers are uniformly distributed, did apply to the tiny fluctuations.

This proved that the primordial microwaves were not random, and so had been artificially encoded, perhaps by some even earlier process. So there was a message, of sorts.

Cosmologists eagerly searched for clues and hit a dead end. The sequence was found to fit no model. This suggested immediately to even nonreligious astronomers that the pattern may have been put there by a being who made our universe: God, in short.

What would such a mathematical message mean, anyway? Only that some rational, counting designer had made our Universe. Beyond that, nothing would be revealed about the being's nature; though of course it would prove the old claim, that God was a mathematician.

Rankled, the physicists quickly compared the observed sequence with the fine structure constant, one of their favorites. The sequence did not fit.

This sent everyone back to fundamentals. Current theory says that tiny temperature fluctuations in the microwaves came from little bumps in the potential function that governed the inflation of the very early universe. Tinkering with those quantum fluctuations, a being could write something simple but profound: God as a quantum mechanic. If, for example, the designer could encode little squiggles on the potential, then the fine-tuned primordial density fluctuations would not be exactly scale-free, and that's where the sky-wide microwave patterns came from.

So of course the physicists followed their current fashion. When comparison with other favorite numbers—the dimensionless ratios of masses and energies and the like—all failed, they tried more advanced theories. They tried prescriptions for various symmetry groups that came from the Lie algebras, as three of the four fundamental interactions we know reflect such gauge theories. No help.

The physicists, who had long been the mandarins of science, then supposed that clues to the correct string theory, a menu currently offering about 10^{100} choices, would be the most profound of messages. After all, wouldn't God want to make life easier for physicists? Because, obviously, God was one, too.

Sadly, no. Nothing seemed to work.

Perhaps the very idea underpinning science—that humans could understand the Universe—had hit a wall. This helped both science and religion.

Excitement increased. If the being was not saying something obvious, then maybe humans had not understood the Universe enough to make out the message. Governments poured money into mathematics and physics. The astronomers protested. If the night sky was a tale told by God, they could read it. The cosmic neutrino and gravity wave backgrounds had not yet been detected, but they could also carry the Word. So it came to be that the cosmologists, too, received the blessing of a large research bounty.

These huge increases in funding drove a renaissance of modern science. Data processors, statistical theorists, observers of obscure spectra—all received a shared. Vast telescopes tuned to the vibrations and emissions of the Universe glided in high orbits, their ears cupped to the distant and primordial.

This largess produced an economic boon, too, as many spinoff technologies benefited commerce. Religious fervor damped, as each faith felt humbled by this proof that the Universe had meaning, yet mankind was not yet advanced enough to fathom it.

At the same time, attention focused on the injunction to mankind in the Old Testament—echoed in other religious founding texts—charging humanity with being the stewards of Earth. The environmental movement merged with the great religions.

Within a century, active adjustment of Earth's reflected sunlight, and capturing of carbon in the oceans and lands, had averted the greenhouse disaster. Church attendance was enormous. Efforts to enhance our knowledge and skills had averted many gathering social conflicts.

Work on the Message continues in the new university departments of Applied Mathematical Theology. Yet to this day, the Message remains untranslated. Perhaps that is just as well.

Appendix 5: “Gravity’s Whispers”

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“The best is the enemy of the good,” Sam said over my shoulder.

I whirled around, knowing the voice, smiling. “What —?”

He sauntered in, grinning in his lopsided way. “At 11 p.m. you’re still working. Know your limits. The data can’t get better when you’re tired, y’know.”

I threw down my pencil. “Right. Pursue the good. Let’s get a beer.”

At the Very Large Array, this meant a long drive back to Socorro. Our offices were there, but I liked spending time out among the big radio dishes, too. On the way back I rolled down the window to smell the tangy spring sagebrush and wondered whether Sam the Slow had finally decided to make a date with me, in his odd way. I’d been waiting half a year.

Then he said: “I was just passing by, thought I’d follow up on that puzzle I sent last week.”

He had sent through a noise-dominated file. I had run one of my custom programs, gotten interested, and wasted a day pulling out a pattern. “You know me too well. I cracked it, yeah.” I gave him a smile he didn’t notice. “Not a very interesting solution.”

“You’d be surprised,” Sam said, watching the desert slide by.

“It’s you guys who surprised the world—the first gravity waves, wow.”

“Yeah, decades of work on LIGO paid off.”

Sam was also modest, a trait that gave him gal problems in the fanatic tech crowd more than once. Getting a [gravitational wave](#) to tweak a cavity, and detect that with interfering waves, had burned 20 years of his life. He

shrugged. “We thought it was a signal from a rotating neutron star with a deformed crust. Say, you have that solution handy?”

I flipped open my laptop. “It’s a string of numbers, turns out to be the zeroes of the Riemann zeta function.”

“Uh huh. Which is —?”

“A famous [function](#) of complex argument. It [analytically continues](#) the sum of an [infinite series](#).”

“Sounds boring.”

“Not so.” At least he was looking at me now. “It’s a big deal in [analytic number theory](#), plenty of applications in [physics](#), [probability theory](#), [Bose–Einstein condensates](#), [spin waves](#) —”

“Useful, good.” Sam was usually sharp, focused, but now he gazed pensively at the stars.

“So how’d you get the detection?” It would help if I got him started about his work —that is, his life. “You guys got rid of the noise from that road traffic and logging at the Louisiana site?”

“Yeah, took years. The signal we finally got had plenty of chirps and bursts in it, a bitch to clean up.”

I grinned. Sam had worked decades on LIGO, and now the milestone was here. “Now that you’ve got LIGO sensitive enough, there’ll be plenty of signals. Supernovas in other galaxies, maybe rattling cosmic strings —”

“I want to understand this one. It’s not a neutron star crust vibration, I think.”

“Huh?” I was already tasting the beer in my mind.

“That decoding you did? That was our signal.”

I blinked. “Can’t be. No natural system—”

“Exactly.” Sam hooked an eyebrow at me.

“What? A tunable gravitational wave with a signal? That’s im—”

“—possible, I know. Unless you can sling around neutron stars and make them sing in code.”

Maybe, just maybe, this could be more important than at last getting Sam to date me. Maybe. “Then. . . you should know that it’s not just a list of numbers. After 20 of the Riemann zeros, there’s something like a proof of the [Riemann hypothesis](#).”

He frowned. “Uh, so?”

“It’s one of the greatest unsolved problems in mathematics. It says that any non-trivial zero has its real part exactly equal to $1/2$.”

He shook his head. “And that’s the attention-catching opener to a SETI signal:“

“So you see, it can’t be. Opening up with pi, or e, prime numbers, the fine structure constant—that makes sense.”

“Sense to the likes of us.”

“So I must’ve made some mistake.”

“No you didn’t.” Sam looked at me with a warm smile. “You’re the only one I could run to with this analysis—the rest of ‘em would laugh. You’re good, really good.”

I leaned over and kissed him. “Congratulations on the Nobel.”

He kissed back, his eyes flickered, he grinned—but he didn’t look happy. He grasped the steering wheel and peered ahead into the starlit darkness. In the high desert you can see stars above the headlights. I knew him enough to see that he was thinking about something that could whisper across the galaxies with gravitation, not using obvious means like radio or lasers. “Any mind that thinks the Riemann numbers are a calling card—and can throw around stars. . .”

I got it. “Yeah. Know your limits. Maybe it’s good, really good, that we can’t possibly answer them.”

Two elaborative comments on references in “Gravity’s Whispers”:
 (a) LIGO is a real scientific effort (with substantial funding, at the level of several hundreds of millions of dollars, from the National Science Foundation), designed to detect gravitational waves. LIGO stands for the *Laser Interferometer Gravitational-Wave Observatory*: it is a joint project staffed with scientists from MIT, Caltech, and other colleges and universities.
 (b) You can find more about the Riemann hypothesis in my book *An Imaginary Tale: the story of $\sqrt{-1}$* , Princeton University Press 2010, pp. 150–155.

Bibliography of Short Stories Cited⁷

- Anderson, Poul, "The Problem of Pain." *Chronicles of a Comer: and other religious science fiction stories* (Roger Elwood, editor, John Knox Press 1974).
- , "The Word to Space," *Other Worlds, Other Gods* (Mayo Mohs, editor), Avon 1971 (published under the pen-name of Winston P. Sanders).
- , "A Chapter of Revelation," *The Day the Sun Stood Still* (Lester del Rey, editor), Thomas Nelson 1972.
- Asimov, Isaac, "The Bicentennial Man" and "Evidence," *Machines That Think* (Isaac Asimov, et al., editors), Holt, Rinehart and Winston 1983.
- , "The Last Question" and "The Last Answer," *Robot Dreams*, Ace 1986.
- , "Reason," *Science Fiction: a historical anthology* (Eric S. Rabkin, editor), Oxford University Press 1983.
- , "The Tercentenary Incident," *The Bicentennial Man and Other Stories*, Doubleday 1976.
- , "That Thou Art Mindful of Him," *Souls in Metal* (Mike Ashley, editor), St. Martin's Press 1977.
- , "The Ugly Little Boy," *Creations: the quest for origins in story and science*, (Isaac Asimov, et al., editors), Crown 1983.

⁷ In this section I've included only short stories (and not book-length works) as they are by far the more difficult to locate. To find a copy of Dante's *Inferno*, or of Arthur C. Clarke's *2001: A Space Odyssey*, or of Carl Sagan's *Contact*, or of H. G. Wells' *War of the Worlds*, shouldn't really be very difficult. The stories listed are most easily found today reprinted in anthologies, and the really good stories are in multiple anthologies. The specific anthology I've given here for each story simply happens to be the one I first used. In the case of short stories that I couldn't find in an anthology, I've immediately cited in the text their original (and only, I suspect) magazine appearance. An older but still quite useful book with an extensive bibliography containing numerous theological SF stories that I have not discussed in this book is *The Transcendent Adventure: studies in religion in science fiction/fantasy* (Robert Reilly, editor), Greenwood Press 1985. I certainly make no claim to have included every last SF story with a religious theme. Many readers will no doubt have a story in mind about which he or she will ask, 'Why isn't [insert your favorite title] here?' The easy answer is, 'I didn't read it' or, perhaps, I *did* read it and decided its message had already been discussed in some other tale. The historian's inescapable fate, I fear, is to be second-guessed by well-read readers! You can write to me at paul.nahin@unh.edu if you want to tell me what you think should be included in a later edition.

- Asimov, Isaac, "Trends," *The Early Asimov, or Eleven Years of Trying*, Doubleday 1972.
- Balchin, Nigel, "God and the Machine," *Fantasia Mathematica* (Clifton Fadiman, editor), Simon and Schuster 1958.
- Beaumont, Charles, "Last Rites," *The Magic Man and Other Science-Fantasy Stories*, Fawcett 1965.
- Benford, Gregory, "Anomalies," *Redshift: extreme visions of speculative fiction* (Al Sarrantonio, editor), ROC 2001.
- Bierce, Ambrose, "Moxon's Monster," *Machines That Think* (Isaac Asimov, et al., editors), Holt, Rinehart and Winston 1983.
- Binder, Eando, "I, Robot," *The Coming of the Robots* (Sam Moskowitz, editor), Collier Books 1963.
- Bond, Nelson, "The Cunning of the Beast," *Other Worlds, Other Gods* (Mayo Mohs, editor), Avon 1971.
- , "Uncommon Castaway," *No Time Like the Future*, Avon 1954.
- Boucher, Anthony, "The Quest for Saint Aquin," *Sacred Visions* (Andrew M. Greeley and Michael Cassutt, editors), TOR 1991.
- Bova, Ben, "Inspiration," *Holt Anthology of Science Fiction*, Holt, Rinehart and Winston, 2000.
- Bradbury, Ray, "The Man" and "The Fire Balloons," *The Illustrated Man*, Doubleday 1951.
- Brunner, John, "The Vitanuls," *Other Worlds, Other Gods* (Mayo Mohs, editor), Avon 1971.
- , "Judas," *Machines That Think* (Isaac Asimov, et al., editors), Holt, Rinehart and Winston 1983.
- , "The Windows of Heaven," *Yet More Penguin Science Fiction* (Brian Aldiss, editor), Penguin 1964.
- Campbell, Jr., John W., "Who Goes There?" and "The Last Evolution," *The Best of John W. Campbell* (Lester del Rey, editor), Nelson Doubleday 1967.
- Chiang, Ted, "Hell is the Absence of God," *The Locus Awards* (Charles N. Brown and Jonathan Strahan, editors), HarperCollins 2004.
- Clarke, Arthur C., "The Nine Billion Names of God," *Other Worlds, Other Gods* (Mayo Mohs, editor), Avon 1971.
- , "The Star," *Science Fiction: a historical anthology* (Eric S. Rabkin, editor), Oxford University Press 1983.
- , "Dial F for Frankenstein" and "The Sentinel," *The Collected Stories of Arthur C. Clarke*, TOR 2000.
- Davidson, Avram, "Or the Grasses Grow," *Science Fiction Showcase* (Mary Kornbluth, editor), Mayflower 1968.
- Del Rey, Lester, "For I Am a Jealous People," *The Best of Lester del Rey*, Ballantine 1978.
- , "Evensong," *Other Worlds, Other Gods* (Mayo Mohs, editor), Avon 1971.
- , "Helen O'Loy," *Machines That Think* (Isaac Asimov, et al., editors), Holt, Rinehart and Winston 1983.

- Dick, Philip K., "Jon's World," *Time to Come* (August Derleth, editor), Farrar, Straus and Young 1954.
- , "The Skull" and "The Great C," *Beyond Lies the Wub*, Gollancz 1988.
- Dickson, Gordon R., "Things Which Are Caesar's," *The Day the Sun Stood Still* (Lester del Rey, editor), Thomas Nelson 1972.
- Ellison, Harlan, "I Have No Mouth & I Must Scream," *I Have No Mouth & I Must Scream* Edgeworks Abbey 2009.
- Farmer, Philip José, "Riverworld," *Down in the Black Gang*, Nelson Doubleday 1971.
- Fitzgerald, F. Scott, "The Curious Case of Benjamin Button," *Pause to Wonder*, J. Messner 1944.
- Gallun, Raymond Z., "Derelict," *The Coming of the Robots* (Sam Moskowitz, editor), Collier Books 1963.
- Gernsback, Hugo, "Ralph 124C 41+," *Science Fiction: a historical anthology* (Eric S. Rabkin, editor), Oxford University Press 1983.
- Godwin, Tom, "The Cold Equations," *The Cold Equations and Other Stories* (Eric Flint, editor) Baen 2004.
- Gunn, James E., "Kindergarten," *Creations: the quest for origins in story and science*, (Isaac Asimov, et al., editors), Crown 1983.
- Harness, Charles, "Child by Chronos," *The Best from Fantasy and Science Fiction* (volume 3), Doubleday 1954.
- Heinlein, Robert, "All You Zombies —," *The Mirror of Infinity* (Robert Silverberg, editor), Canfield 1970.
- , "By His Bootstraps," *The Arbor House Treasury of Great Science Fiction Short Novels*, Arbor House 1980.
- , "Universe" and "Common Sense," *Orphans of the Sky*, Baen 2001.
- Keizer, Gregg, "Angel of the Sixth Circle," *Perpetual Light* (Alan Ryan, editor), Warner 1982.
- Kilworth, Garry, "Let's Go to Golgotha!," *The Songbirds of Pain*, Victor Gollancz 1984.
- Knight, Damon, "Shall the Dust Praise Thee?" *Dangerous Visions* (Harlan Ellison, editor), Simon and Schuster 1967.
- Leinster, Murray, "First Contact," *Aliens* (Ben Bova, editor), St. Martin's Press 1977.
- , "Sidewise in Time," *Before the Golden Age: a science fiction anthology of the 1930s*, (Isaac Asimov, editor), Doubleday 1974.
- Lem, Stanislaw, "Project Genesis," *Creations: the quest for origins in story and science*, (Isaac Asimov, et al., editors), Crown 1983.
- , "Non Serviam," *A Perfect Vacuum*, Northwestern University Press 1999.
- Lewis, Anthony R., "The Turing Test," *Deals with the Devil* (Mike Resnicl et al., editors) Daw 1994.
- Martin, George R. R., "The Way of Cross and Dragon," *The Locus Awards* (Charles N. Brown and Jonathan Strahan, editors), HarperCollins 2004.
- Matheson, Richard, "The Traveller," *Third from the Sun*, Bantam 1954.
- McDevitt, Jack, "Friends in High Places," *A Cross of Centuries* (Michael Bishop, editor), Thunder's Mountain Press 2007.

- McDevitt, Jack, "Time's Arrow," *The Fantastic Civil War* (F. McSherry, Jr., editor), Baen 1991.
- Merritt, Abraham, "The Last Poet and the Robots," *Science Fiction: a historical anthology* (Eric S. Rabkin, editor), Oxford University Press 1983.
- Moorcock, Michael, *Behold the Man, A Cross of Centuries* (Michael Bishop, editor), Thunder's Mountain Press 2007.
- Payes, Rachel Cosgrove, "In His Own Image," *Strange Gods* (Roger Elwood, editor), Pocket 1974.
- Porges, Arthur, "The Devil and Simon Flagg," *Fantasia Mathematica* (Clifton Fadiman, editor), Simon and Schuster 1958.
- , "The Rescuer," *Yet More Penguin Science Fiction* (Brian Aldiss, editor), Penguin 1964.
- Russell, Erik Frank, "Second Genesis," *Deep Space*, Fantasy Press 1954.
- Schenck, Hilbert, "The Theology of Water," *Perpetual Light* (Alan Ryan, editor), Warner 1982.
- Sheckley, Robert, "Can You Feel Anything When I Do This?" *A Science Fiction Argosy* (Damon Knight, editor), Simon and Schuster 1972.
- Silverberg, Robert, "Good News from the Vatican," *Beyond the Safe Zone*, Donald I. Fine, Inc., 1986.
- , "The Assassin," *101 Science Fiction Stories* (Martin Greenberg and Charles Waugh, editors), Avenel 1986.
- , "Thomas the Proclaimer," *The Day the Sun Stood Still* (Lester del Rey, editor), Thomas Nelson 1972.
- Spinrad, Norman, "The Weed of Time," *Alchemy & Academe* (Anne McCaffrey, editor), Ballantine 1980.
- Sturgeon, Theodore, "Microcosmic God," *Microcosmic God: the complete stories of Theodore Sturgeon* (volume 2), North Atlantic Books 2010.
- Tenn, William, "On Venus, Have We Got a Rabbi," *Wandering Stars: an anthology of Jewish Fantasy & Science Fiction* (Jack Dann, editor), Jewish Lights Publishing 1998.
- Thomas, John B., "Return to a Hostile Planet," *Strange Gods* (Roger Elwood, editor), Pocket 1974.
- Van Vogt, A. E., "The Seesaw," *Creations: the quest for origins in story and science*, (Isaac Asimov, et al., editors), Crown 1983.
- Vincent, Harl, "Rex," *The Coming of the Robot* (Sam Moskowitz, editor), Collier Books 1963.
- Wells, H. G., "Davidson's Eyes" and "The Plattner Story," *Best Science Fiction of H. G. Wells*, Dover 1966.
- , "The Star," *Science Fiction: a historical anthology* (Eric S. Rabkin, editor), Oxford University Press 1983.
- Wilcox, Don, "The Voyage that Lasted 600 Years," *Isaac Asimov Presents the Best Science Fiction Firsts*, Barnes and Noble Books 1996.
- Wyndham, John, "The Lost Machine," *Machines That Think* (Isaac Asimov, et al., editors), Holt, Rinehart and Winston 1983.

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