

Chasing ± Proof



Finding Faith

A YOUNG SCIENTIST'S
SEARCH FOR TRUTH
IN A WORLD OF
UNCERTAINTY

TOM RUDELIUS, PhD

FOREWORD BY ARON WALL, PhD

In this delightful book, physicist Tom Rudelius takes us on an intriguing journey towards faith. *Chasing Proof, Finding Faith* is funny, and also bracingly honest, as Rudelius shares his struggles with doubt and anxiety. I couldn't put it down.

ARD A. LOUIS, PhD, professor of theoretical physics at the University of Oxford

Chasing Proof, Finding Faith is an unflinching and courageous engagement with the most troubling intellectual objections to the Christian faith, combined with the author's thoughtful and compelling responses and profoundly vulnerable and endearing authenticity. All this is carried along by an incredibly interesting storyline. I've never read anything quite like it.

PAT MCLEOD, PhD, Cru chaplain at Harvard University, cofounder of the Mamelodi Initiative, and author of *Hit Hard*.

Imagine realizing that you're a Christian after you've taken a polygraph for a job interview at the NSA. Or picture yourself as a string theory scholar reasoning through the idea of miracles. Those are just two of the incredible stories in this journey to an unexpected faith in Jesus—a journey that includes ups and downs, doubt and faith, anxiety and peace; and a journey that invites you, the reader, to a more honest and hope-filled faith. I couldn't put it down and finished it (almost) in one sitting.

BETHANY JENKINS, vice president of Veritas Media

This raw, honest account captures the joys and the doubts that come with conversion and shows how silly it is to think that a commitment to cutting-edge science is incompatible with Christianity. Tom Rudelius is one who follows the evidence wherever it leads him—in theoretical physics, and in religious faith.

MOLLY WORTHEN, PhD, associate professor of history at the University of North Carolina at Chapel Hill, and *New York Times* contributor

String theorist Tom Rudelius maps his own journey into faith in a scientific manner. In *Chasing Proof, Finding Faith*, we don't discover an apologetic so much as a history of one man's fearlessness and discoveries—bit by bit, thought by thought, conclusion after conclusion, criticism after criticism, exploration after exploration, and answer after answer. Rudelius's memoir of his resistance, his struggles, his moments of insight, and his relationship with his twin brother provides a transparent story of conversion. One doesn't find simplicities and overcooked confidence; one finds a soul in search of God; and when found in Christ, a resting soul.

SCOT MCKNIGHT, PhD, professor of New Testament at Northern Seminary, and author of *A Church Called Tov*

Chasing Proof, Finding Faith



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Finding Faith

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Chasing Proof, Finding Faith: A Young Scientist's Search for Truth in a World of Uncertainty

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Contents



Foreword	ix
Introduction	I
PART I: The Road to Faith	7
PART II: No Such Agency	85
PART III: Faith and Doubt	145
PART IV: The King	195
Epilogue	241
Notes	247
About the Author	251

Foreword

ARON WALL



THE BOOK YOU ARE HOLDING is a remarkable one. There are lots of books out there promoting Christianity, by the type of people you might call *salesmen*. The goal of a salesman is to produce a watertight and squeaky-clean argument, to convince you that only one position is intellectually respectable and fully capable of servicing your needs. He is afraid to admit any weakness in his arguments. He is afraid that if he talks honestly about his own doubts and struggles, his audience will take it as a reason to reject the product he is promoting. If you want a book like that, I suggest you look elsewhere. My friend Tom Rudelius is not a salesman. But he is a person who cares deeply about what is real, in both scientific and religious contexts. And because of this, he is also unafraid to share his spiritual doubts and struggles, both before and after he became convinced that Christianity is objectively true.

This book is about a process of growth. Growth in learning that adult responsibility requires something more than just being “a good kid” who follows the rules well enough to be praised by authority figures. Growth in becoming a

scientist. Growth in becoming more interested in faith. And a gradual process of becoming more thoughtful about how these various goals fit together.

Some people, when they talk about the supposed conflict between science and religion, imagine some mythical, archetypal battle in which Galileo and the Inquisition are forever facing off about whether or not the earth goes around the sun. Others have in mind some godless college professor seducing young college students away from the true faith with spurious arguments. Every now and then, life fits these simplistic stereotypes. But more often they blind us to what is actually going on.

One of the advantages of actually *being* a scientist (instead of idealizing “Science,” with a capital *S*) is that one has a more realistic idea of what kinds of results the scientific method can actually show or prove. Similarly, actually *being* religious tends to give one a different perspective on what is most essential to faith in God—a rather different perspective than one might get just by arguing with atheists (or theists) online. Like Tom, I am both a practicing physicist and a practicing Christian. And I am convinced that there is no conflict between science and religion so long as we define both domains by what is *centrally* important to them. But a lot of people are more interested in arguing about peripheral matters: topics that shouldn’t really be regarded as either established scientific theories *or* as core articles of faith.

This book is also the account of a sudden conversion, prompted by a dramatic crisis event. And like many Damascus Road events, the personal experiences that went

into this event were unique. They don't follow the expected pattern. As C. S. Lewis said in *Surprised by Joy*, God is “very unscrupulous” in the methods he uses to recruit people for his Kingdom.

For example, if there's one thing modern skeptics and the Old Testament prophets agree on, it's that astrology is bunk. Generally speaking, we cannot predict political events on earth by looking up at the sky—and yet in the Christmas story we see God making an exception, using an astronomical event to bring the magi to the Christ child. These men were not Jews, but followers of the Zoroastrian religion. And yet God met these sages by starting where they were, and led them by a gradual journey to where he was. Now, I have no idea what sort of natural or supernatural event the Star of Bethlehem might have been. Perhaps it doesn't matter. What matters about the story, for our purposes, is this image: God using the magi's interest in the starry heavens to lead them on to the greater Light.

As a more recent example, when I was in graduate school I knew a friend who started identifying as a Christian after a six-hour religious-themed hallucination, brought on by smoking some marijuana. (Apparently, on rare occasions, this drug produces effects more reminiscent of LSD. Or so the internet tells me.) Now, to be clear, I would strongly recommend *against* anyone using drugs to gain religious insights, since most hallucinations probably have far more to do with one's own subconscious than anything divine. That's why I advised this friend to stick to more conventional spiritual practices in the future, such as Bible reading and attending

church. I think that's a very sensible rule for human beings to follow, but it's not a rule by which God is bound. He can reach out and save people however he wants. As we see in the Gospels, when people came to Jesus, it didn't always happen in a way that is satisfying either to skeptics or religious traditionalists!

This book is not about drugs or astrology. But there is another pseudoscientific way to try to discover hidden truths, which plays a key role in Tom's story—namely, the polygraph test. Forget what you've seen in the movies: In reality the polygraph is a far cry from being an actual "lie detector" test. So I find it regrettable that US intelligence services still use this discredited and deceptive tool. But though I'm tempted to go on a long rant about this topic (and exceed my allotted word count), I'm not going to, because it would be a distraction from the most important part of Tom's story. I also won't steal Tom's thunder by explaining exactly how the polygraph fits into his life's narrative. You'll have to read the book to find that out.

The one aspect I wish to highlight is this: None of the government workers involved in the polygraph charade had any religious purpose in mind. (Nor would I want to be a part of any group that uses such recruiting techniques!) But that is not the ultimate truth of the situation. All along, it was God who was in the driver's seat. God was acting with love and mercy, first to reveal Tom to himself, and then to reveal himself to Tom.

As the Old Testament hero Joseph said to his brothers: "You meant evil against me, but God intended it for good."¹

Many years before, they had sold Joseph into slavery, but the final outcome was that he became the ruler of Egypt, in order to save the lives of many people. I'm sure being betrayed and kidnapped didn't seem like a particularly good thing to the young Joseph at the time. But later, his perspective on this event was completely different, because he knew what had come out of it.

Similarly, a religious conversion changes our perspective on life. Before coming to Christ, our life may have seemed like a meaningless jumble of events. But afterwards, in retrospect, we can see how some of these events were orchestrated by God, who was reaching out to save us from our sins. There are still many unanswered questions. But now we are sharing life with another. Like getting married and starting a family, it changes the focus of the rest of our lives.

Perhaps you don't share this religious perspective. Perhaps you are coming to this book more as a skeptic. That's fine; this book is still written for you. Wherever you are in your spiritual journey, I hope you can appreciate the honesty and vulnerability displayed here, in this thought-provoking memoir.

ARON WALL, PhD, assistant professor of theoretical physics, University of Cambridge, and author of the blog *Undivided Looking*

Introduction



UNTESTABLE. *Irrational. Unscientific.*

I tend to hear the same objections to both my religious faith *and* my field of study, which is string theory. I chose string theory as my vocational pursuit because it is the best candidate for a “theory of everything” that would unify fundamental physics into a single coherent framework. String theory is controversial because it is difficult to verify empirically. Unlike most areas of science, where hypotheses are developed, tested by experiment, and refined by the scientific method, our knowledge of string theory comes almost exclusively from mathematical calculations.

I typically spend my days reading research papers written by other string theorists, writing research papers of my own,

meeting with collaborators, performing calculations with paper and pen, and writing simple computer programs to perform calculations that are too difficult or time-consuming to do by hand. I almost never touch experimental data. I'm often not even aware of the latest experimental discoveries in physics until my dad (who is not a scientist) sends me an article from a popular science magazine such as *Scientific American* or *Wired*.

Truth be told, the absence of experiments in string theory is what sold me on it in the first place. I'm not opposed to experimental physics; I'm just not very good at it! At Cornell, during my undergrad years, my fellow physics majors amused themselves by watching me struggle unsuccessfully with the lab equipment. (They weren't quite as amused when I established the curve in our math classes.)

To some, string theory is antithetical to science, narrowly defined as the practice of the modern scientific method. This view is typically part of a larger narrative in which scientific progress has illuminated an otherwise dark, primeval, superstitious world. Accordingly, the scientific method serves as the grand arbiter of knowledge, and any conclusions drawn from scientific experiments are gospel truth and must never be questioned. Any other source of knowledge—if such a source even exists—is considered inferior.

But this view of science is misguided.¹ People living long before the scientific revolution understood that the natural world functions with uniformity and regularity. Back then, as today, experts in history, philosophy, mathematics, and law discerned truths about reality (though without many of the

tools of modern science), shedding light in areas where the scientific method is relatively unhelpful. And though science has done some remarkable things, it has never allowed us to achieve absolute certainty.

That isn't a criticism of science. The truth is, we don't know anything with 100 percent certainty. We don't know with 100 percent certainty that there are other conscious minds besides our own. We don't know with 100 percent certainty that the world didn't begin five seconds ago with a built-in "past." The unvarnished truth is that our knowledge of reality isn't black-and-white. Our world is full of uncertainty. Science, as an enterprise, specializes in quantifying, minimizing, and navigating this uncertainty.

At its best, science does this incredibly well. Innovations such as statistical analysis, double-blind procedures, and repeated trials offer some areas of modern science an astonishingly high degree of certainty, justly meriting praise. In one of science's greatest triumphs, particle physicists have now measured the anomalous magnetic dipole moment of the electron to ten decimal places of precision, finding perfect agreement with theoretical predictions.

Other areas of science don't allow such a high degree of certainty in their experiments.

Not long ago, I was diagnosed with high cholesterol. Despite extensive online research of the subject, I'm still uncertain about whether I should eat egg yolks. When it comes to the field of nutrition, the complicated nature of the human body (plus the fact that subjects in nutrition experiments often lie about how much junk food they've eaten)

makes it impossible to achieve the same level of certainty that particle physicists enjoy.

This uncertainty is not a failure of science. The true beauty of science is not that it correctly answers every question we ask of it, like some sort of divine oracle, but that it humbly admits when it doesn't know the answer, quantifying its uncertainty in terms of p-values and error bars and thereby encouraging future generations to seek answers with greater clarity. (Unfortunately, scientists don't always demonstrate the humility that science itself exhibits.)

Yet, while science pushes us to search for truth and clarity in the world around us, it doesn't excuse us from dealing with the inescapable uncertainties we encounter along the way. Nutritionists still must make dietary recommendations for the public to follow. I still must decide whether to toss the yolks from my breakfast omelet.

As a theoretical physicist, I make decisions about which calculations to attempt and which areas of research to pursue, even in the face of uncertainty. I settled on string theory not because I'm certain it is the correct theory of everything, but simply because it's the best option I've found, the clearest route toward an understanding of the fundamental laws of nature.

Likewise, as a human being, I make decisions about which spiritual path to follow.

I grew up in a largely nonreligious family and never thought much about God or theology until I was in college. When I began exploring the subject, guided by my twin brother, Steve, I soon found myself in yet another world of

uncertainty. There was no end to the questions, doubts, and arguments for and against the existence of God. As in string theory, scientific experiments were not very helpful, but neither was my quest for truth a total shot in the dark. Some of the arguments for the existence of God carried weight; some of the arguments against the existence of God did too.

Yet, once I started exploring the subject of faith, there was no going back. Ignoring the fundamental realities underlying our sense of meaning, purpose, existence, and morality in order to persist in blissful ignorance would be a leap of faith of its own. Certainty wasn't an option, no matter where I turned. Instead, I had to figure out which option was the best one. To do that, I had to build a bridge of knowledge that would make the leap of faith as short as possible.

This book is the story of how I built that bridge, with help from many others. And it's the story of a strange new world called Christianity I found on the other side.

Part I



The Road
to Faith

“TOM, I’VE DECIDED TO GET BAPTIZED.”

When this message from my twin brother popped up on my phone one morning in May 2009, I was more than a little upset. I already felt betrayed by Steve’s conversion to Christianity, and this was further salt in the wound.

“You’ve already been baptized,” I messaged back, referring to the sprinkling we received at our grandparents’ church in Minneapolis shortly after we were born. “These things don’t wear off over time.”

“We need to talk,” Steve responded. “My baptism is on June 25. You should come, and I’ll explain it then.”

I agreed to go to Steve’s baptism, but I wasn’t enthusiastic about it. Ever since grade school, he and I had committed

ourselves to the pursuit of two things and two things only: *academic excellence* and *sports*. Any departure from that path was a repudiation of the Rudelius Twin Way. I would feel similarly betrayed later that year, when he started dating (his future wife) for the first time.

Steve explained that his decision to get baptized wasn't out of religious duty, but rather because he had rejected God when we were growing up and now wanted to publicly announce his newfound faith as an adult. This bothered me too, not only because Steve was changing his chosen path, but because I was afraid he would now be looking down his nose at me.

"I think I'm a pretty moral person," I told him, "and I don't want you judging me."

Even more than the fear of Steve's judgment, I was afraid I was losing my brother. Growing up, he and I watched a lot of *The Simpsons*, so in my mind the typical Christian was someone like Ned Flanders, the Simpsons' quirky, nerdy, Bible-toting next-door neighbor.

"I'm happy for you becoming a Christian," I told him, "but you better not become Ned Flanders."

Religion was never part of my experience growing up. Because of my dad's job as a management consultant, we moved every few years—from Minnesota to Japan to England—eventually settling in Northern Virginia, where I remained through high school. But in all those years, I went to church only a handful of times, and only when I was with my grandparents.

Of course, that doesn't mean I didn't believe in God. After all, where else was I supposed to turn when I needed a

miraculous intervention? I once had a minor leg injury and prayed that God would heal it in time for my indoor soccer game. However, when my leg actually got better, I didn't attribute it to supernatural intervention. I just figured I got lucky.

Back then, I would readily identify with Christianity if it was convenient for me. Once, in a high school anthropology class, the teacher asked us to raise our hands if we believed that everything in the Bible was literally true. My two friends in the class both raised their hands, so I did too. Now, I certainly had never read the entire Bible. I had read portions of Genesis in my tenth-grade English class as part of a unit on ancient literature from around the world, and that was about it. But I wanted to fit in, so I faked it.

My true feelings toward religion were much less positive. In a psychology class that same year, I read a story about a woman who had driven herself into a mental health crisis by trying to avoid behavior she had been taught was sinful. The assignment was to generate discussion questions for the class. My first question was "Does organized religion do more harm than good?"

I realize now that the question was rather misguided. To somehow lump all faith systems into a single category of "organized religion" would be like lumping Tylenol and heroin into a single category and asking whether drugs do more harm than good. To lump Jim Jones, L. Ron Hubbard, Mother Teresa, and Martin Luther King Jr. into the blanket category of "religion" would be silly. Yet, when I was in high school, my classmates and I did it all the time. I can't even remember my own answer to the question I posed. I guess

it really didn't matter to me. At the time, all religion fit into an even broader category of things I didn't need to waste my time thinking about.

My functional agnosticism was broken in the rare moments when I truly needed outside help. When I was twelve, my mom's brother Jim passed away unexpectedly from a heart attack. And for a few brief moments, everyone in the family—parents, grandparents, aunts, and uncles—believed in heaven. It didn't matter that few of us professed belief in God or went to church on a regular basis. It was unthinkable that someone as young, kind, smart, and committed to his family as Jim could be anywhere but heaven, and so heaven had to be real. Regardless of our religious beliefs, we all prayed the week of Jim's passing.

For me, the sense of irreversible loss brought on by Jim's death was overwhelming. In a video game, when you get killed, you start the level over again as if nothing happened. But real life isn't a video game, and it hit me hard to realize that Jim would never bang on his drum set again or crack a home run for his company's softball team.

I cried at Jim's funeral when I started wondering whether he and I could play catch again someday when we were both in heaven. Yet, deep down, I had my doubts that such a place even existed.