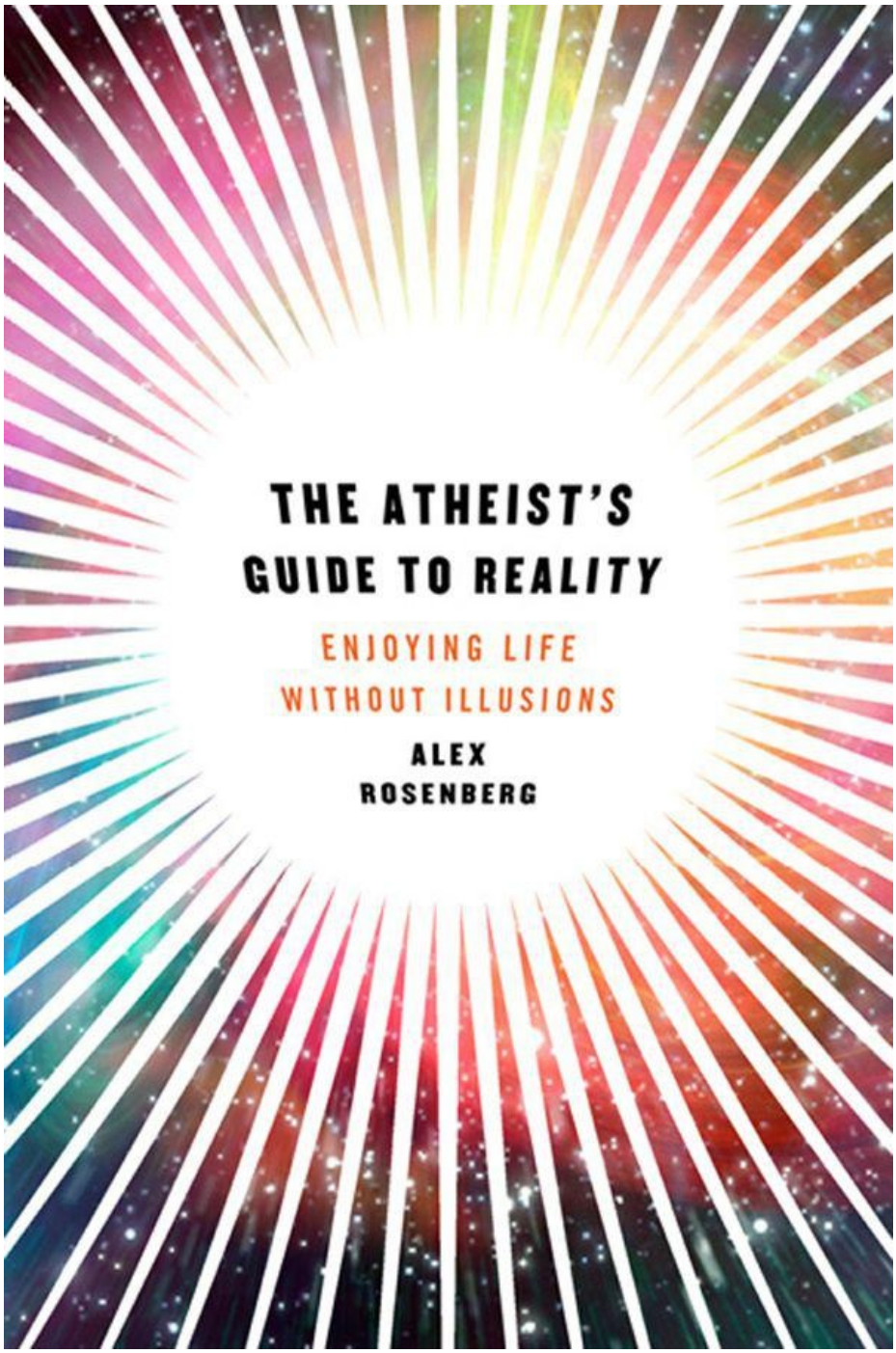
THE ATHEIST'S
GUIDE TO REALITY
ENJOYING LIFE
WITHOUT ILLUSIONS
ALEX
ROSENBERG

Also by Alex Rosenberg

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Darwinian Reductionism, or, How to
Stop Worrying and Love Molecular Biology

Philosophy of Biology: A Contemporary Introduction
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PREFACE

WHAT IS THE NATURE OF REALITY, THE PURPOSE of the universe, and the meaning of life? Is there any rhyme or reason to the course of human history? Why am I here? Do I have a soul, and if so, how long will it last? What happens when we die? Do we have free will? Why should I be moral? What is love, and why is it usually inconvenient?

These questions are unavoidable. But the answers aren't. Indeed, most people manage to avoid them completely—and do it quite intentionally. People who believe in religion are particularly adept at avoiding the answers. This is not a book for them. This is a book for those who want to face up to the real answers to these questions. It's a book for people who are comfortable with the truth about reality. This is a book for atheists.

Most people think of atheism as one big negative. Atheists perpetuate the stereotype by devoting so much time and energy to broadcasting the evidence against God's existence. But if atheism ever were a matter of evidence, it isn't any longer. Contemporary religious belief is immune to rational objection. Often we are wasting our time refuting it.

There is much more to atheism than its knockdown arguments that there is no God. There is the whole rest of the worldview that comes along with atheism. It's a demanding, rigorous, breathtaking grip on reality, one that has been vindicated beyond reasonable doubt. It's called science.

Science enables atheism to answer life's universal and relentless questions with evidence employing a real understanding of the natural world. Some of the answers it provides to these questions may disconcert you. Several will certainly surprise you. But they are all as certain as the science on which our atheism is grounded. An unblinking scientific worldview requires atheism. That's why 75 percent of the members of the National Academy of Sciences admit to being atheists. Four-fifths of the rest say they're agnostics—no opinion either way. It can't be a coincidence that 95 percent of the most distinguished scientists in America (along with their foreign associate members) don't believe in God.

If science made you an atheist, you are already as strongly committed to the serious scientific answers to the unavoidable questions as you are to atheism.

Science reveals a rough reality. But in its reliance on our capacity for experimentation, discovery, and cumulative knowledge, it solves all the great puzzles that people have tried to deal with through faith, philosophy, and alcohol and drugs. In doing so, science illuminates some of humanity's most remarkable qualities and unravels some of its deepest illusions. But atheists will find a surprising amount of consolation in this worldview, or at least a certain amount of relief from anxiety.

It was an American public radio humorist, Garrison Keillor, who first called the daunting problems that we all face "the persistent questions." I have adopted his label to emphasize the fact that they keep bothering us until we find the answers. In fact, science has found the answers—some of them 400 years ago, others in the nineteenth century, and several only quite recently. These answers are provided by the very same facts that atheism itself rests on. That's why they are a part—the positive part—of the atheist's worldview.

Science—especially physics and biology—reveals that reality is completely different from what most people think. It's not just different from what credulous religious believers think. Science reveals that reality is stranger than even many atheists recognize. From the nature of the reality uncovered by science, consequences follow. This book is about those consequences. It provides an uncompromising, hard-

boiled, no-nonsense, unsentimental view of the nature of reality, the purpose of things, the meaning of life, the trajectory of human history, morality and mortality, the will, the mind, and the self.

REALITY IS ROUGH. But it could have been worse. We could have been faced with reality in all its roughness *plus* a God who made it that way. Take, for example, what the British historian Eric Hobsbawm called "the short twentieth century." It starts in 1914 with the beginning of trench warfare in the First World War and carries on through the worldwide influenza epidemic of 1918, the Russian civil war, collectivization, and great purge, the Great Depression of the 1930s, through the Second World War's Holocaust and the nuclear attacks on Japan, and all the way past the Chinese Great Leap Forward famine of 1958 to the collapse of the Berlin Wall in 1991—a 73-year century with enough horrors to last Earth a millennium. Now add to those horrors the God of the Abrahamic religions—Judaism, Christianity, and Islam—and you get an even worse reality; it's one just as rough as the real world, but it adds a moral monster who arranged for it all to happen.

In recent years, there have been a number of very popular books devoted to disapproving of as well as disproving religious belief. Some of them attack arguments for God's existence, and others show the harm—intellectual and moral—that religions do in the name of their respective deities. A Nobel Prize–winning physicist, Steven Weinberg, once said, "With or without religion, good people can behave well and bad people can do evil; but for good people to do evil, that takes religion." He had a point.

But it's not *my* point. I am not interested in hammering another nail into the intellectual coffin of theism. Enough of those arguments already exist. And the relative lack of originality in the arguments of the recent best sellers attacking religion (*The God Delusion*, *God Is Not Great*, *Letter to a Christian Nation*) shows that the arguments have been around for quite some time and have achieved little effect. The effort to argue most people out of religious belief was doomed by the very Darwinian evolutionary forces that the most fervent of Christians deny. The most sophisticated believers understand the arguments against theism. Yet they are still able to create clever excuses for harboring theistic convictions as logically self-consistent if ultimately unprovable. If they can do it, imagine how much easier it is for credulous people, who are neither as well informed nor as logically scrupulous, to continue to believe. There is little point in preaching to these unconverted.

This book doesn't preach to the converted either. Instead, its aim is to sketch out what we atheists really should believe about reality and our place in it. The picture painted here is subject to completion and modification. What is not debatable are the broad outlines of the sketch. They are the reasons we can be so confident about the nature of reality. All we need to understand its character are the parts of modern science that are no longer in doubt. These parts are so basic that nothing to be uncovered by physics or biology will make science take them back.

WHY MIGHT SUCH a book be of interest to people who have already, for one or another of the many good scientific reasons, given up all religious belief?

One reason is that you and I are assailed annually, even weekly, with books, articles, and television programs seeking to sow doubts about the completeness and credibility of science. There are apologists who suggest that science's findings are perfectly compatible with the higher superstitions, the morally and emotionally uplifting religions. Worse yet, some of the advocates of religion argue that science's teachings do not touch on these matters of "ultimate concern." Among the figures sowing these doubts about the reach of science are individuals with sturdy scientific credentials, like John Polkinghorne, Knight of the British Empire, member of the Royal Society, trained high-energy physicist, Cambridge professor, and Anglican vicar. And there are well-known theologians, like John Haught, Catholic defender of Darwin against intelligent design, making common cause with scientists as well known as everyone's favorite

biologist, the late Stephen Jay Gould. Francis Collins, one-time head of the Human Genome Project and now director of the National Institutes of Health, joined this choir, writing a book claiming that there is no incompatibility between religion and what empirical inquiry has revealed. I am sure that Collins is sincere. But the claim that religion and science don't compete is good politics. It's also confused, as we'll see.

Atheists and our fellow travelers need some protection against this tide of impressively credentialed misunderstanding. In a way, this book may serve like one of those pamphlets that used to be available in Anglican Churches: "What to say when a Jehovah's Witness [substitute Mormon missionary, Seventh Day Adventist, representative of the Reverend Moon, and so forth] comes to your door." It aims to suggest how we scoffers should deal with reconcilers and mystery-mongers.

Most importantly, besides rebutting misrepresentations of science, we should be clear for ourselves about what our attachment to science, as the right description of the world, really commits us to. This book identifies science's answers to the perennial questions we humans pose to ourselves about reality and our place within it. These are the questions that vicars, visionaries, gurus, and all too many philosophers have tried to answer, often with ulterior motives and never with the kind of evidence that is worthy of a question of worldly importance. The right answers are ones that even some scientists have not been comfortable with and have sought to avoid or water down.

It's worth repeating that this book is written mainly for those of us who are already deniers, not just doubters and agnostics. Although we will address the foibles and fallacies (as well as the wishful thinking) of theists, we won't treat theism as a serious alternative that stills needs to be refuted. This book's intended readers have moved past that point. We know the truth.

Knowing the truth makes it hard not to sound patronizing of the benighted souls still under religion's spell. So from time to time, some of the tone of much that follows may sound a little smug. I fear I have to plead guilty to this charge, with mitigation. So far as I can see, belief in God is on a par with belief in Santa Claus.

How did I come to that conclusion and to the others in this book? That question is ambiguous. It could be a request for some autobiography—for the particular path that brought me personally to trust science's answers to the persistent questions. Or it could be a request for the facts and arguments that justify these answers. The answer to the second question is given in the 12 chapters that follow. But here is a brief answer to the first question—how I managed to find a way through the thicket of illusions about ourselves and the world that come along with religion. Make no mistake, my route was not the only route or even the most direct one.

I am a philosopher, or if that sounds pretentious, a philosophy professor. I didn't start out to be one. I wanted to study physics because I really wanted to understand the nature of reality. The more I learned, the more I was disappointed with the answers physics provided. They just didn't scratch the itch of curiosity that was keeping me up at night. If I was going to stop the itch, I was faced with two choices: therapy or philosophy. With enough psychotherapy, I thought, I might get over worrying about what the nature of reality really was. Psychotherapy was too expensive and philosophical therapy was too interesting.

So I switched to philosophy. I thought that if science couldn't answer my unavoidable questions, at least philosophy could tell me why not, and maybe it could even answer the questions.

Imagine how troubling it was for me to discover quite soon that the history of philosophy was mainly a matter of great minds wrestling with science! At least from the beginning of the seventeenth century onward, the agenda of every one of the great philosophers has been set by advances in physics and chemistry and later also in biology.

It took a few years, but by reading David Hume (1711–1776), I was able to figure out the mistake preventing science from satisfying me. The mistake, as Hume showed so powerfully, was to think that

there is any more to reality than the laws of nature that science discovers.

For the past 40 years, I have been trying to work out exactly how advances, especially in biology, neuroscience, and evolutionary anthropology, fit together with what physical science has long told us. I spent a lot of that time on the foundations of economics and the other behavioral sciences. I even went back to grad school for a couple of years to study molecular biology. The results were a lot of books and papers on technical issues in the philosophy of science, matters of purely academic interest. Nobody gets tenure, in philosophy at any rate, for figuring out the nature of reality. Doing that turned out to be a by-product of all the thinking that went into those academic articles and scholarly books.

Now I have finally seen how all the pieces fit together to settle the daunting, unavoidable, relentless questions we all have about the nature of things and the nature of us. There is only one way all the pieces of the puzzle fit together. But there are lots of different ways in which to figure out that one way. The path I took to put the pieces together was just one path of many, and probably not the most efficient one. I hope this book will help you save a step or two in coming to the same conclusions.

Chapter 1

ANSWERING LIFE'S PERSISTENT QUESTIONS: DO YOU WANT STORIES OR REALITY?

EVERYONE SEEMS TO KNOW WHAT LIFE'S persistent questions are. Almost all of us have been interested in answering them at one time or another, starting back sometime in our childhood when the lights were turned out and we found ourselves staring at the ceiling, unable to sleep. As time goes on, thinking about sex increasingly pushes these thoughts out of adolescent minds. This is fortunate. Otherwise there would be an even greater oversupply of philosophy and divinity students than there is of English majors. But the questions keep coming back, all too often right after sex.

THE PERSISTENT QUESTIONS

These are the questions that always bothered me as I stared at the ceiling after the lights were turned off. Maybe they're the same ones you've entertained in periods of insomnia. Besides *Is there a God?* (everyone's favorite), there are lots of other persistent questions about the nature of reality, the purpose of the universe, the meaning of life, the nature of the self, what happens when we die, whether there is free will, or any will at all, and if so, does it have to go through probate? (That last one may keep you up nights but doesn't really count as persistent unless an apartment in Manhattan is at stake.)

Some people are troubled by immorality almost as much as they are by immortality. (Did you have to read that sentence twice?) Not as many are troubled by it as we might like. But almost everyone wants to know the nature of right and wrong, good and evil, why we should be moral, and whether abortion, euthanasia, cloning, or having fun is forbidden, permissible, or sometimes obligatory.

This book aims to provide the correct answers to most of the persistent questions. I hope to explain enough about reality so that, as the old textbooks used to say, answers to any remaining questions "can be left as an exercise to the reader."

Here is a list of some of the questions and their short answers. The rest of this book explains the answers in more detail. Given what we know from the sciences, the answers are all pretty obvious. The interesting thing is to recognize how totally unavoidable they are, provided you place your confidence in science to provide the answers.

Is there a God? No.
What is the nature of reality? What physics says it is.
What is the purpose of the universe? There is none.
What is the meaning of life? Ditto.
Why am I here? Just dumb luck.
Does prayer work? Of course not.
Is there a soul? Is it immortal? Are you kidding?

Is there free will? Not a chance!

What happens when we die? Everything pretty much goes on as before, except us.

What is the difference between right and wrong, good and bad? There is no moral difference between them.

Why should I be moral? Because it makes you feel better than being immoral.

Is abortion, euthanasia, suicide, paying taxes, foreign aid, or anything else you don't like forbidden, permissible, or sometimes obligatory? Anything goes.

What is love, and how can I find it? Love is the solution to a strategic interaction problem. Don't look for it; it will find you when you need it.

Does history have any meaning or purpose? It's full of sound and fury, but signifies nothing.

Does the human past have any lessons for our future? Fewer and fewer, if it ever had any to begin with.

The one persistent question not addressed directly in the pages that follow (though we'll have some fun with it here and there) is the very first one: *Is there a God?* We already know the correct answer to that one. In the rest of this book, we will take the best reason for atheism—science—and show what else it commits us atheists to believing. There are compelling reasons to deny God's existence, but those reasons don't just support a negative conclusion: no God, end of story. They provide everything we need to answer all the other questions that inevitably come along with the God question.

There are many reasons for not spending any more time on the question, *Is there a God?* Here are three good ones:

First of all, lots of people have been there and done that—so many that most professional atheists long ago began to repeat their own and other people's solid arguments. In fact, we really haven't needed one since Hume wrote his *Dialogues Concerning Natural Religion*, first published, by his arrangement, three years after his death in 1779. (Is there a lesson here for us atheists?)

Second reason: Atheist tracts don't work. We all know what's wrong with the standard arguments for God's existence. The decisive arguments against God's existence are also well known. It's equally evident that the failure of the positive arguments for God's existence and the force of the negative arguments against it don't persuade theists. They know the knockdown arguments as well as we do, and still they believe. We are not going to convince them.

The third reason we won't bother to refute theism is that we have better things to do—like figuring out exactly what we ought to believe about a reality without a God. Once a person has become an atheist, a lot of questions become even more relentless than they were for the theist. After all, theists can just trust in God and see whether that works to answer these questions. At least for some believers, it does work, at least for some of the time. But for us atheists, *What, me worry?* is not a stopping place.

If you buy into that part of science that is pretty well fixed and not likely to be revised by even the most radical new discoveries, there is really only one challenge for the committed atheist: to understand the science that provides the obviously and irrefutably correct answers to the persistent questions. Understanding the science is a challenge because of the way science packages its discoveries. Our brain just didn't evolve to be able to unwrap the package easily. This is why most people have never been able to deal with science. And it's the main reason why there have always been far fewer atheists than believers.

WHAT'S IN A NAME? WOULD ATHEISM BY ANY OTHER NAME SOUND SWEETER?

Before tackling the persistent questions, we need a brief detour to talk about labels. The real problem for atheists is not a matter of what to believe. The real problem is finding a label that describes what we *do*

believe instead of one that only announces what we *don't* believe.

Atheists have always faced a public relations problem, especially in the United States. Most Americans won't trust them. That's one reason why only one elected official, Pete Stark, the U.S. congressional representative from San Francisco—hotbed of Christian fundamentalism—has ever admitted to atheism. He did it because an atheist group offered a $1,000 reward to the highest-ranking elected official in the country willing to own up to atheism. The problem is less serious in Britain, where the last foreign minister announced he was an atheist without the prompting of a reward.

In recent years, some atheists have tried to deal with the public relations problem by finding a new label. Atheists, they argue, should call themselves "Brights." The word *bright*, with its connotations of intelligence and enlightenment, recalls the eighteenth-century period known as the Age of Reason, a time when the natural sciences and scientific philosophy flourished in Europe, before being eclipsed by Romanticism. Of course, there is now a Brights website and a *Wikipedia* article, too. They even have a logo.

But the label "Bright" has some obvious limitations. It's precious and self-congratulatory. It also offends theists, who can't help concluding that we "Brights" must think they are "dim."

Some atheists will also be unhappy with "Bright" because they are down on the Enlightenment. It ended badly—remember the reign of terror during the French Revolution? If that's a good reason, or if we worry that the label will provoke needless offense, let me suggest something else:

Scientism—noun; scientistic—adjective.

Scientism has two related meanings, both of them pejorative. According to one of these meanings, scientism names the improper or mistaken application of scientific methods or findings outside their appropriate domain, especially to questions treated by the humanities. The second meaning is more common: Scientism is the exaggerated confidence in the methods of science as the most (or the only) reliable tools of inquiry, and an equally unfounded belief that at least the most well established of its findings are the only objective truths there are.

If we are unhappy with "atheist" because it defines us by what we do not believe, and uncomfortable with "Bright" because it's too cute or too clever by half, we can take "scientism" away from our opponents. We have at least one good reason for trying.

"Scientism" is the pejorative label given to our positive view by those who really want to have their theistic cake and dine at the table of science's bounties, too. Opponents of scientism would never charge their cardiologists or auto mechanics or software engineers with "scientism" when their health, travel plans, or Web surfing are in danger. But just try subjecting their nonscientific mores and norms, their music or metaphysics, their literary theories or politics to scientific scrutiny. The immediate response of outraged humane letters is "scientism."

Let's expropriate the epithet. In the pages that follow, we won't use the label "Bright" as a variant on atheist. But we'll call the worldview that all us atheists (and even some agnostics) share "scientism." This is the conviction that the methods of science are the only reliable ways to secure knowledge of anything; that science's description of the world is correct in its fundamentals; and that when "complete," what science tells us will not be surprisingly different from what it tells us today. We'll often use the adjective "scientistic" in referring to the approaches, theories, methods, and descriptions of the nature of reality that all the sciences share. Science provides all the significant truths about reality, and knowing such truths is what real understanding is all about.

Most people don't understand science, and most Americans don't even believe its findings. They place the persistent questions in the hands of their pastors and try not to think about them. The trouble is, depositing these questions with your priest, vicar, imam, or rabbi never works. The questions persist. In America, every year you can find a new best-selling book devoted to answering these questions, usually in the Christian bookstores. They are published by people eager to make a buck on the combination of

gullibility and anxiety that Americans seem to have so much of. A good example of the sort of book I mean is *The Purpose Driven Life*, written by a now very rich preacher who provides the pat Christian answers to the persistent questions. These answers, and their packaging, have made organized religion the most successful long-term growth industry in America since before the republic was founded. But the fact that there is a market for a new Christian self-help book every year shows that the pat answers don't really scratch the itch.

There are two differences between the real answers to the persistent questions and the ones religion keeps trying to get people to buy into. First, the answers that science provides are not particularly warm and fuzzy. Second, once you understand them, they stick. You are unlikely to give them up, so long as you insist that evidence govern your beliefs.

To answer these unavoidable questions correctly, we have to be scientistic. Being scientistic doesn't mean giving up anything we like to do—singing in a choir, volunteering for Habitat for Humanity, even enjoying literary criticism. It certainly doesn't require we become scientists. We don't even have to be scientific if that means being dispassionate, unemotional, number-crunching nerds. Being scientistic just means treating science as our exclusive guide to reality, to nature—both our own nature and everything else's.

HOW MOTHER NATURE MADE THINGS DIFFICULT FOR SCIENCE

The most serious obstacle facing atheists when we set out to answer the persistent questions for ourselves is one erected by Mother Nature herself. Ironically, this barrier to scientism results from the very Darwinian evolutionary process that theism has to reject (as we'll see in Chapter 3). It's actually worse than ironic because the same Darwinian process that made it hard for anyone to understand science's answers to these questions made it easy to be seduced by religion's answers to them!

The big obstacle to accepting science's answers to life's relentless questions is deep, subtle, insidious, purely psychological, and probably hardwired into our genes. It's a problem that even the most scientistic among us must grapple with. It's not that some people will find the answers science gives scary or hard to follow. The problem doesn't even look like a problem. It has to do with the way we—educated or uneducated, atheist or theist, agnostic, deist, scientist—in fact, all human beings—like our information to be "packaged."

We are suckers for a good story—a description of events in the form of a plot with characters driven by motives. If information doesn't come in story form, we have trouble understanding it, remembering it, and believing it. Unfortunately for real science (and for science writers!), its real explanations never come in the form of stories. Luckily for religion, it almost always comes in the form of stories. So religion has a huge psychological advantage in the struggle to convince people of the answers to the relentless questions.

Science has three things going for it that religion doesn't have. First, the facts that make any story true, when it is true, are to be found in equations, theories, models, and laws. Second, most of religion's best stories are false. Third, and most important, science shows that the stories we tell one another to explain our own and other people's actions and to answer the persistent questions are all based on a series of illusions. That should be enough to forestall our innate penchant for stories.

We won't spend any time showing that religion's most important stories are false, but the chapters that follow will build the case against stories teaching us anything important about reality, history, or ourselves. By the time you get to the last chapter, you will understand why, no matter how enjoyable a story is, it's never much more than a story. Scientism requires that we be able to see through the superficial charms of narrative, the specious sense of closure provided by happy (or even sad) endings, the feeling of relief from curiosity when dots are connected into a plausible conspiracy. We need to begin

to disentangle ourselves from our species' love affair with stories. That's the first challenge for scientism.

We prefer our information to come in a package with a natural starting place, an exciting, tension-filled middle, topped off by a satisfying finish. We prefer stories with plots that make sense of the order of events by revealing their meanings. The plot reveals how the outcome resulted from the motives, plans, and purposes of the heroes and heroines, the villains, and the bystanders that strut across the story's stage. It's not just that we find stories easy to remember or that they excite our emotions or even that they satisfy the psychological itch of curiosity better than anything else. Our attachment to stories is much stronger and more mischievous. Experiments show that when information comes to us any other way, we have trouble understanding it, remembering it, and believing it. When we have a choice between buying into a story versus believing anything that can be expressed as a lab report or a computer program or a mathematical model, we'll take the story every time. Think about humanity's greatest hits (they also used to be among the Humanities' greatest hits before "the canon" took a hit): the *Odyssey*, *Hamlet*, *War and Peace*, *Middlemarch*, *Sophie's Choice*—great narratives, sources of meaning and wisdom, because they are stories that move us emotionally. Stories, and only stories, "sell."

Why are we suckers for stories? Why is it that despite their appeal, stories—even true ones—never really convey any deep understanding of anything? The answer requires some of the story-free science that is so hard to keep in mind—Darwin's theory of natural selection and the most basic laws of physics. Chapter 2 will provide some of the details, and Chapters 6–9 the rest. But we can sketch some of them here.

Everyone loves narratives, across all cultures and all times, and all that is needed is language—any language at all that humans speak. As we'll see in Chapter 5, our brain was shaped by natural selection to take on board very early in life, or maybe even innately, a set of guesses about how other people operate. The guesses eventually take the shape of a sort of theory about what people want, what they think is going on around them, and how those wants and beliefs work together to determine people's choices and actions. One reason to think that this "theory of mind" is almost innate is that infants begin to use it when they are only 6 or 7 months old. If it is not innate, then we are primed to learn it early in life with only very little experience. When we get to Chapters 6 and 7, we'll see what's profoundly wrong about this theory of mind and how and why consciousness seduces us into believing it anyway. Wrong or not, it was crucial to the evolution of *Homo sapiens* that we be equipped and predisposed to imbibe this theory at our mother's breasts if we didn't already know it at birth.

There are a few other species whose behavior shows that they have at least an incipient, basic theory of mind. Elephants, dolphins, and of course other primates treat one another in ways that strongly suggest that some device in their heads enables them to figure out and predict the behavior of others. It's a trait that goes along with large brain size and great intelligence. In our hominin ancestors, the ability to predict the behavior of others got better and better over the evolutionary time scale.

A theory of mind is part of nature's quick and dirty solution to a huge challenge for our species' survival—a "design problem" that faced our hominin ancestors over the last few million years. Given our puny size, our conspicuous lack of speed or strength, we would have been easy pickings for African megafauna (lions and tigers and bears, oh my). The only way we were going to survive was through cooperation, coordination, and collaboration: warning each other and ganging up to protect ourselves or chase the predators away so we could scavenge their kills. That requires the sort of rudimentary ability to predict other people's behavior that a theory of mind provides. It turns out that having a theory of mind is not having a set of thoughts about other organisms' beliefs and wants and how they shape their behavior. It's having a set of abilities as a result of the evolution and development of certain neural circuits. As the ability got more refined and enhanced by natural selection, our ancestors moved up the carnivore food chain until they had become the top predators everywhere.

When our ancestors lived in small family groups, predicting what family members were going to do

made the difference between life and death and eventually between feast and famine. Later, when populations became large enough so that you were meeting strangers, there had to be further selection for the ability to predict behavior. In the evolutionary past, if other people could pose a threat, then you needed to know what they wanted to do to you so that you could prevent them from doing it. If other people could do something nice for you, you needed to figure out how to motivate them to do it. Predicting other people's actions is no easy matter. We're probably not much better at it than our late Pleistocene ancestors.

Long ago, these facts about the benefits and threats people pose to each other put further selective pressure on refining the theory of mind into a practice of plotting out other people's actions, to figure out their motives, their desires and goals, and their beliefs about how to realize them. There was, in effect, selection pressure on our ancestors that resulted in their telling themselves "whodunit" stories.

Natural selection uses carrots along with sticks to get its way. So, sooner or later, it started to reward the tactic of working out other people's motives by watching their actions. Doing so began to produce a pleasurable feeling of relief from curiosity or even from anxiety. That very special "aha!" feeling.

How did Mother Nature manage to match up good guesses about why people act the way they do with the satisfying experience of curiosity allayed? Roughly the same way it got us to think about sex all the time—by natural selection. Among our distant ancestors, some were hardwired to feel nothing when they had sex, some to feel a little pleasure, some to feel a lot. Some may have even felt some pain. Such variation is the way of the world. No prize for guessing which of these creatures had more offspring and which went extinct. After long enough, the only mammals left were the ones hardwired the way most of us are—to have orgasms during intercourse. The same goes for coupling together the ability to guess the plot and getting that feeling of curiosity satisfied.

Natural selection doesn't have time to wander through all the variations that might just randomly emerge, looking for the perfect solution to a survival problem. Instead it makes do with the first quick and dirty solution that comes along. In the time it would take to find a perfect solution, our ancestors would have all died out. In this case, natural selection hit on a solution that is imperfect in two different ways. On the one hand, the theory of mind it endowed our species with has profound limitations: Too often we are completely floored by the behavior of others. Our theory of mind fails in its job of enabling us to predict behavior. Our theory of mind also reflects another of natural selection's imperfections: To ensure survival, Mother Nature overshoots. Instead of building the exact solution to the problem of figuring out other people's motives, Mother Nature selected for people who see plots everywhere: *conspiracy theorists*. The simplest way to create someone who is good at reading motives from other people's behavior is to overdo it: endow them with a penchant for seeing motives everywhere—in human behavior and animal behavior, but also in the seasons, the weather, health and illness, the sunrise, lightning storms, earthquakes, droughts, beavers coming out of their lodges in the spring—everything.

Humans tend to see everything in nature as organized by agents with motives, often malevolent ones. We are all natural-born conspiracy theorists. That's why we don't need to be taught how to suss out other people's motives. That's why the same grand conspiracy theory operates in all cultures and why we can often appreciate stories from other cultures almost as much as our own. That's why we remember narratives and think of them as naturally easy to understand without any special knowledge or information. We all have a strong incentive to force anything we need to remember into a story with a plot. Once we make sense of a chain of events—by finding the motives of agents behind the events that make it into a story—we get that familiar feeling of relief from curiosity or anxiety about how the story turned out.

People have been making a sport of our insistence on seeing everything this way for a long time now. There is a famous joke about Talleyrand, the sinister foreign minister who managed to serve Louis XIV, then Napoleon, and then the restored French kings who followed him. When he died in 1838, the story goes that the Austrian foreign minister, Prince Metternich, asked himself, "I wonder what he meant by

that."

A lot more of the details of why nature forced us to be conspiracy theorists are found in Chapter 6. But enough has been said here to see why we are not really psychologically satisfied by an explanation unless it's a good story. The drive to force events into the mold of a story with a plot is a hangover from our evolutionary past. That drive has been around for so long that it's practically hardwired into our brain.

It's unfortunate for science that no matter how imaginative we are, we just can't convey the content of science in stories with plots (even if we employ such convenient but misleading metaphors as "Mother Nature" and "design problem"). That makes the human penchant for stories the greatest barrier to understanding what science actually tells us about reality. At the same time, it is the slippery slope down which people slide into superstition.

IT'S NOT STORYTIME ANYMORE

Real science isn't a set of stories, not even true ones, and it can't be packaged into stories either. Real science is much more a matter of blueprints, recipes, formulas, wiring diagrams, systems of equations, and geometrical proofs. That's why we have a hard time following it, understanding it, accepting it, applying it, or even remembering it. And that's why most people don't much like it either.

Science doesn't deny that it's sometimes important to get right what actually happened in the past. There are even some sciences in which the right chronology is crucial: biology, geology, even cosmology. They give us the sequence of events that actually happened: biologists need to know the order of events in evolution, geology can tell us about the process that made the continents, and cosmology chronicles the major events in the history of the universe since the big bang.

But these three kinds of history show us that in science the real work of explanation is not achieved by the chronology—the before and the after, the earlier and the later. The events that make up reality are ordered by processes that are completely reversible. With only one exception, the most basic laws of physics work the same way forward in time as backward. As far back as Isaac Newton's discoveries in the seventeenth century, scientists have recognized that the fundamental laws that stitch up every sequence of events—big and small—don't care about time order! That means that when it comes to science's understanding of reality, stories have to give way to equations, models, laws, and theories in which there is no preferred time order of events from earlier to later.

Think about how the dinosaurs became extinct. Over the last 50 years, a vast amount of evidence has revealed what really happened. The evidence from geology, paleontology, climate science, and several other independent lines of inquiry suggest that 65 million years ago, a large asteroid hit the Yucatán peninsula with the force of about 100 trillion tons of TNT and kicked up enough dust to produce several atmospheric changes that blocked the sunlight for at least a year. The result was the disappearance of most of the herbivorous dinosaurs' plant food, leading to their starvation. Then came the death of their carnivorous predators and their eventual conversion to petroleum. But what makes this the right story of why the dinosaurs disappeared? It's because the basic links in this chain of events are forged together by a set of fundamental laws of chemistry and physics. But these very same laws could have produced exactly the reverse sequence of events. It's perfectly compatible with the laws of motion—Newton's, Einstein's, even the laws of quantum mechanics—for each and every atom and molecule in the whole vast process to move in exactly the reverse direction. Starting from the petroleum, the atoms and molecules can move in trajectories that produce the dinosaurs from their rotting corpses, that grow the plants back from straw into bloom, that send the atmospheric dust clouds back down to fill up the crater in the Yucatán, and that reconstitute the asteroid and even push it back into space. I know it sounds absurd, but it's true. The basic laws of motion that govern everything that happens to everything in the universe work both ways. They are what hold everything together. They tell no stories because they are completely

indifferent to which event is the beginning and which is the end, so long as the sequences are mirror images of one another. What's more, there is no story anyone can tell about why the basic laws are true.

Scientism doesn't have an easy task. Mother Nature built our minds for other purposes than understanding reality. She was trying to solve the problem of equipping us to work with one another. Solving that problem ensured that when it comes to the real nature of the world and our place in it, most people just wouldn't get it. That means that scientism's answers to life's persistent questions are going to be hard to accept, and not just because they come without a sugar coating. The answers science provides—based on time-reversible laws—just can't be turned into stories with plots. Scientism has to face the fact that most people aren't going to have the patience for the full answers that science gives to these questions.

Despite all that natural selection for preferring stories, some of us have managed to get past the biggest conspiracy theory of them all: the story of how God put us here. We have the capacity to break through and understand the real answers that science provides. The next chapter will begin the process, explaining why physics tells us everything we need to know about the nature of reality. Once we have a handle on the fundamental nature of reality, we'll then be able to see exactly how physics, by itself, makes the process Darwin discovered the only way that any life, and ultimately intelligent life, could have emerged in the universe. We'll learn why the purposelessness of the physical universe also pervades biology, neuroscience, social life, and even conscious thought. By the time we get to the end of this book, we'll see that science beats stories.

We'll have to accept that the answers to the relentless questions won't come packaged in a lot of stories. And understanding the answers won't produce that sudden relief from curiosity we all experience from a good bedtime story. But if we can work through the details, we'll get something much better—a real understanding of life, the universe, everything, warts and all.

HERE IS A BRIEF GUIDE to the landscape of scientism we will travel through on the way to the (story-free) scientific answers to the persistent questions. I'll admit here and now that sometimes the tour guide will break down and tell a story or two. Remember, when I do, it's just to help you remember things, not to help you understand them.

Scientism starts by taking physics seriously as the basic description of reality. Fortunately, we don't need to know much physics to answer our unrelenting questions. Even more fortunately, what we do need is relatively easy to understand and not at any risk of being overturned by future discoveries in physics. The slogan of Chapter 2, that the physical facts fix all the facts, will get repeated throughout the rest of the tour.

First, we see how these facts determine the biological ones, and then through biology, how physics fixes the rest of the facts about us.

Taking physics seriously has the surprising consequence that you have to accept Darwin's theory of natural selection as the only possible way that the appearance of purpose, design, or intelligence could have emerged anywhere in the universe. We'll see exactly why this is so and what this means for the persistent questions about the meaning of life in Chapters 3 and 4.

Scientism dictates a thoroughly Darwinian understanding of humans and of our evolution—biological and cultural. But that does not in any way commit us to thinking about human nature or human culture as hardwired, or in our genes. It does mean that when it comes to ethics, morality, and value, we have to embrace an unpopular position that will strike many people as immoral as well as impious. So be it. Chapter 6 takes the sting out of the charge, however, without denying its basic accuracy. If you are going to be scientistic, you will have to be comfortable with a certain amount of nihilism. But as we'll see, it's a nice sort of nihilism.

Adopting nihilism isn't even the hardest thing scientism will force on us. If physics fixes all the facts and

fixes the biological ones via natural selection, then it will fix the psychological facts about us the same way. Consciousness tells us that we are exceptions to the physical world order, but science requires us to give up consciousness as a guide to the truth about us. Chapter 7 catalogs some of the empirical discoveries of the last 50 years that make this conclusion inescapable. Freed from the snares of introspection, in Chapters 8–10 we will be able to put together the whole "story," showing how our own mind seduces us into being relentless conspiracy theorists. The love of stories comes to us in a package that also includes the illusion of free will, the fiction of an enduring self, and the myth of human purpose. A scientistic worldview has to give up all of that. In exchange, at least you get correct answers to life's questions.

So, individual human life is meaningless, without a purpose, and without ultimate moral value. How about human history or human culture, civilization, or the advancement of our species as a whole? It's even easier for science to show that human history has no such trajectory than it is to show that individual lives lack one. Seeing why this is so is again really just a matter of working out how the physical facts, by fixing the biological and psychological processes, also fix the social, political, economic, and broadly cultural ones, too. This makes history bunk, as Chapter 11 headlines.

It's true that scientism asks us to surrender a lot of complacent beliefs in exchange for the correct answers to the persistent questions. If this seems hard to take, the last chapter cushions the blow, showing that we can surrender all the illusions of common sense, religion, and new-age and traditional mystery mongering, along with the meretricious allure of storytelling; indeed, physics, chemistry, biology, and neurology have shaped most of us to survive very nicely without them. And just in case, there's always Prozac.