INTRODUCTION

Steven Weinberg, winner of the Nobel Prize in physics for combining electromagnetism and the weak force into the electroweak force, has a deservedly high profile. He is respected not just as a very good scientist but also as one who is able to communicate the most technical aspects of his work to the general public. His book *The First Three Minutes* (1977), about the early history of our universe, is a dazzling display of expertise combined with a brilliant ability to explain complex ideas without at any point trivializing them or condescending to his audience. Rightfully, he has assumed the mantle of a leading spokesperson for science. When he speaks, he speaks with authority. One should therefore take him seriously when he speaks, as a scientist, about so important a topic as religion. And spoken he certainly has. In 1999, in a dialog on religion with another scientist (Sir John Polkinghorne), he said: "Religion is an insult to human dignity. Without it you would have good people doing good things and evil people doing evil things. But for good people to do evil things, that takes religion." Also speaking as a scientist, he tells us: "This is one of the great social functions of science – to free people from superstition" (see Weinberg 2001, 231, for a printed version). Let there be no mistake, the greatest superstition of them

all is religion. It is here that science has its most powerful cleansing action: "It's a consequence of the experience of science. As you learn more and more about the universe, you find you can understand more and more without any reference to supernatural intervention, so you lose interest in that possibility. Most scientists I know don't care enough about religion even to call themselves atheists. And that, I think, is one of the great things about science – that it has made it possible for people not to be religious" (Angier 2001, 37). Not only does science refute religion, it makes it basically boring.

There are Nobel laureates even more famous than Weinberg who share his sentiments entirely. Thanks to his discovery of the double helix, Francis Crick was one of the iconic figures of the twentieth century. He has written: "If revealed religions have revealed anything it is that they are usually wrong" (Crick 1994, 258). And elsewhere: "A knowledge of the true age of the earth and of the fossil record makes it impossible for any balanced intellect to believe in the literal truth of every part of the Bible in the way that fundamentalists do. And if some of the Bible is manifestly wrong, why should any of the rest of it be accepted automatically?" He added that "it is clear that some mysteries have still to be explained scientifically. While these remain unexplained, they can serve as an easy refuge for religious superstition. It seemed to me of the first importance to identify these unexplained areas of knowledge and to work toward their scientific understanding whether such explanations would turn out to confirm existing beliefs or to refute them" (Crick 1988, 11). Revealingly, this quote came from that section of Crick's autobiography where he tells us that he is "an agnostic with a strong inclination toward atheism" (p. 10). Crick's codiscoverer of the double helix, James Watson, holds very similar sentiments: "I don't think we're for anything, we're just products of evolution. You can say 'Gee, your life must be pretty bleak if you don't think there's a purpose' but I'm anticipating a good lunch." On being asked if he knew any religious scientists: "Virtually none. Occasionally I meet them and I'm a bit embarrassed because I can't believe that anyone accepts truth by revelation" (BBC film interview with Richard Dawkins, 1996).

These are the heavyweights of science. The popularizers have no such claims to great achievement, but in their way they are even more important in forming the public's opinion about science and its relationship to the rest of our culture, including – especially including – religion. Here the hostility of science toward religion – toward

the Christian religion – moves from the strong to the frenetic. Today's most popular science writer is the English biologist Richard Dawkins. He has written one smash-hit best-seller after another. Through them all, not to mention in numerous occasional pieces and interviews, one sees a growing hostility to religion – a hostility that Dawkins roots in his love and respect for science: "Faith is the great cop-out, the great excuse to evade the need to think and evaluate evidence. Faith is belief in spite of, even perhaps because of, the lack of evidence" (Richard Dawkins, untitled lecture, Edinburgh Science Festival, 1992). "I am against religion because it teaches us to be satisfied with not understanding the world" (RichardDawkins.net Quote 49). "It is fashionable to wax apocalyptic about the threat to humanity posed by the AIDS virus, 'mad cow' disease, and many others, but I think a case can be made that faith is one of the world's great evils, comparable to the smallpox virus but harder to eradicate" (Dawkins 1997, 2b). We reach the apotheosis in his most recent book, *The God Delusion*: "Once, in the question time after a lecture in Dublin, I was asked what I thought about the widely publicized cases of sexual abuse by Catholic priests in Ireland. I replied that, horrible as sexual abuse no doubt was, the damage was arguably less than the long-term psychological damage inflicted by bringing the child up Catholic in the first place" (Dawkins 2007, 316).

You might protest, with reason, that scientists are not always the best people to discern and understand the full implications of their own work. We must defer to them as scientists, but as thinkers about the broader implications of what they produce we should turn to others. We should turn to those whose professional expertise is directed toward the nature of science and how it relates to the nonscientific, including religion. We should turn to the philosophers and historians of science. Prepare for disappointment if you expect to hear another song. The philosopher Daniel Dennett, a former president of the American Philosophical Association, well known for his provocative and sparkling works on cognitive science and more recently on Darwinian evolutionary theory, makes no bones about his dislike of religion and his belief that science can and should sweep away such pernicious nonsense. "If religion isn't the greatest threat to rationality and scientific progress, what is? Perhaps alcohol, or television, or addictive video games. But although each of these scourges – mixed blessings, in fact – has the power to overwhelm our

best judgment and cloud our critical faculties, religion has a feature of that none of them can boast: it doesn't just disable, it honours the disability." He sneers that: "People are revered for their capacity to live in a dream world, to shield their minds from factual knowledge and make the major decisions of their lives by consulting voices in their heads that they call forth by rituals designed to intoxicate them." Concluding: "Our motto should be: Friends don't let friends steer their lives by religion" (Dennett and Winston 2008, 14).

Fellow philosopher Philip Kitcher dwells on the suffering brought on by the struggle for existence, the prelude to Charles Darwin's mechanism of evolutionary change, natural selection. He writes:

> [George John] Romanes and [William] James, like the evangelical Christians who rally behind intelligent design today, appreciate that Darwinism is subversive. They recognize that the Darwinian picture of life is at odds with a particular kind of religion, Providentialist religion, as I shall call it. A large number of Christians, not merely those who maintain that virtually all of the Bible must be read literally, are providentialists. For they believe that the universe has been created by a Being who has a great design, a Being who cares for his creatures, who observes the fall of every sparrow and who is especially concerned with humanity. Yet the story of a wise and loving Creator, who has planned life on earth, letting it unfold over four billion years by the processes envisaged in evolutionary theory, is hard to sustain when you think about the details. (Kitcher 2007, 122–3)

He writes of having believed that Darwinism was reconcilable with Christianity and – with the fervor of a repenting sinner at an evangelical revivalist meeting – insists that he alone should be held responsible for "the earlier errors that I recant here" (p. 180).

The distinguished historian of science William Provine has spent a lifetime trying to atone for his Christian childhood.

> Of course, it is still possible to believe in both modern evolutionary biology and a purposive force, even the Judeo-Christian God. One can suppose that God started the whole universe or works through the laws of nature (or both). There is no contradiction between this or similar views of God and natural selection. But this view of God is also worthless. Called Deism in the seventeenth and eighteenth centuries and considered equivalent to atheism then, it is no different now. A God or purposive force that merely starts the universe or works through the laws of nature has nothing to do with

> human morals, answers no prayers, gives no life everlasting, in fact does nothing whatsoever that is detectable. In other words, religion is compatible with modern evolutionary biology (and indeed all of modern science) if the religion is effectively indistinguishable from atheism. (Provine 1987, 51–2)

Provine thinks that you have to check your brains at the door of the church and that the only reason why scientists in America do not speak out is because they fear the loss of their grants, a real possibility in a society where so many of the citizens and their political leaders are practicing Christians. "Rather than simple intellectual dishonesty, this position is pragmatic" (p. 52).

It is true that not everyone subscribes to the "warfare" thesis embraced by these various people of science. Unfortunately, the proposed alternatives run the gamut from the barely honest, through the inept and gullible, to the banal and inadequate. Before his too-early death in 2002, the Harvard paleontologist Stephen Jay Gould was as much a public figure of science as Dawkins is now. His pronouncements on science and culture were taken by many as gospel (to use a metaphor). His fondness for baseball and his fascination with its statistics were considered proof that America's national pastime is truly God-given (to use another metaphor). There was even an episode of *The Simpsons* devoted to him (at which point the metaphors are exhausted). He was not just a public figure for science but was prepared to use his time and energies in its defense, appearing as an expert witness for the American Civil Liberties Union in Arkansas in 1981, when there was a successful attack on a law mandating the teaching of Biblical literalism in the biology classrooms of the publicly funded schools of the state. In one of his later books, *Rocks of Ages*, Gould supposedly defended the integrity of religion in the face of science, declaring them to be noncompeting world pictures or (to use his term) "Magisteria." However, when you started to read the fine print, you soon discovered that Gould missed his calling as an illusionist. You had better not make too many claims about God or the Trinity or the Resurrection or any of those other extraneous eruptions on the fair face of religion. Claims of this kind fall into the domain of science: "what the universe is made of (fact) and why does it work this way (theory)." Stick to morality, a kind of sentiment with vaguely mystical connotations, and you will do just fine. Talk of miracles and that sort of thing is just silly. When Arthur

Peacocke, biochemist, Anglican priest, and winner of the Templeton Prize for Advances in Religion, presumed to suggest that God creates continuously through evolution rather than in one fell swoop, his God was ridiculed as one "retooling himself in the spiffy language of modern science" (Gould 1999, 217). Truly, Gould was happier joining the chorus of the scientists I have just introduced. We humans "are here because one odd group of fishes had a peculiar fin anatomy that could transform into legs for terrestrial creatures; because the earth never froze entirely during an ice age; because a small and tenuous species, arising in Africa a quarter of a million years ago, has managed, so far, to survive by hook and by crook. We may yearn for a higher answer – but none exists" (Stephen Jay Gould, *Life* magazine, December 1988, quoted in Haught 1996, 290). On another occasion, writing of the way in which a comet hit the earth 65 million years ago, thus eliminating the dinosaurs and making possible the rise of the mammals, he quipped: "In an entirely literal sense, we owe our existence, as large and reasoning mammals, to our lucky stars" (Gould 1989, 318).

The Reverend Professor Sir John Polkinghorne, another Anglican priest, another Templeton Prize winner, physicist, Fellow of the Royal Society, and debating partner of Steven Weinberg, has labored long to show the compatibility of science and religion. He writes that although "there is a feeling abroad that somehow science and religion are opposed to each other," in fact "science and religion seem to me to have in common that they are both exploring aspects of reality. They are capable of mutual interaction which, though at times it is puzzling, it can also be fruitful" (Polkinghorne 1986, xi). Unfortunately, Polkinghorne's writing soon descends from disinterested analyses of the science-religion relationship into apologies for thinking that fits more comfortably into the culture of Elizabeth the First than Elizabeth the Second. He may not have faith enough to raise Lazarus from the dead, but he does a pretty good job on pulling out the stakes from the hearts of arguments long buried by such philosophers as David Hume and Immanuel Kant. He has abandoned the quest to defend religion in the face of science for dubious excursions into showing that science really has Meaning, with a capital M. Modern physics, particularly, reveals the face of the Creator – as in the case of the Shroud of Turin, it is all just a question of suspending judgment and looking hard enough. Those constants – the force of gravity, the speed of light, the attractions between molecules, and

so forth – cannot be just chance. They point to something, and that something is upward.

Then, again, there is Philip Kitcher. He may think that science destroys traditional belief, but he still refers to himself as a "spiritual Christian."

> Spiritual Christians abandon almost all of the standard stories about the life of Jesus. They give up on the extraordinary birth, the miracles, the literal resurrection. What survive are the teachings, the precepts and parables, and the eventual journey to Jerusalem and the culminating moment of the Crucifixion. That moment of suffering and sacrifice is seen, not as the prelude to some triumphant return and the promise of eternal salvation – all that, to repeat, is literally false – but as a symbolic presentation of the importance of compassion and of love without limits. We are to recognize our own predicament, the human predicament, through the lens of the man on the cross. (Kitcher 2007, 152–3)

The trouble with this, of course, is that it may indeed do for Kitcher – and perhaps for Gould. It may do for humanists and even for Unitarians, not to mention an assortment of Episcopelian bishops. It will not do for Christians. They really are providentialists. They do not want to "abandon almost all of the standard stories about the life of Jesus." Many of them want a Virgin Birth, miracles, and a literal Resurrection. All want the "triumphant return and the promise of eternal salvation." If getting on with science means that you cannot have these things, then so much the worse for science.

It is people like this who have set the question I shall tackle in this book. I am fully aware that there are those on the side of religion who are no less hostile to science. What I have to say will be as pertinent to these people as to any, but in this book my focus is on the people of science – among whom I would include myself. I accept and love science as much as any of the men I have just introduced. I spent the early part of my life learning about science and have now devoted all of my adult life to exploring it, expounding it, defending it. However, I am far from thinking that science is all there is in life, and it is this belief that motivates me here. I want to ask about the nature of science and about its limits. I want to see if indeed science is truly so antithetical to religious thinking. I want to see if, rather, one can be both a scientist or lover of science and, with integrity, a person of religion – more particularly, because I can do only so many things at the same time, if you can cherish science and

its achievements and be a Christian, holding with dignity and proper conviction the things that are central to that religion.

I take seriously the notion of "things that are central to that religion." For this reason, this is the first and last you will read here of biblical literalism. I am fully aware that many, probably the majority, of Americans believe in the Bible taken absolutely literally – six days of creation, six thousand years ago, universal flood sometime shortly thereafter. Obviously claims like these are in conflict with modern science, as are the more specific claims of particular religions. Modern anthropology clashes categorically with the Mormon claim that the native people of America are the lost tribes of Israel. My position is simply that none of this is part of traditional Christianity, the Christianity of Augustine and Aquinas, Luther and Calvin. I am not saying that none of these beliefs was ever held, even by the people just listed, but I am saying that traditional Christianity has always insisted that truth cannot be opposed to truth, and that if modern science shows literal claims to be false, then these claims must be understood symbolically or metaphorically. Augustine insisted on this – the ancient Jews were nomadic people who did not have the scientific sophistication of educated Romans – and so too did Calvin, who spoke of God "accommodating" his language to the common people. Modern-day literalism, Creationism so-called, is an idiosyncratic legacy of nineteenth-century, American, evangelical Protestantism. Politically, it needs to be taken seriously. In a work trying to understand the relationship between science and the core of Christianity, the religion of the West of the past two thousand years, it can be ignored. I should say that in arguing thus I am being neither cavalier nor lazy. In several works I have discussed literalism in very great detail, both philosophically and historically, explaining why I find it less than adequate as a belief system. It is now time to talk of other things. (I discuss American biblical literalism in Ruse 1988, 2001, 2005, and 2008b, among other places.)

Lest you fear that I have a hidden agenda – perhaps, like John Polkinghorne, secretly wanting to proselytize, or, possibly worried about the threat to science in the United States posed by the forces of fundamentalist religion, about to offer a case based on political or (what Provine calls) pragmatic factors – I must at once emphatically tell you otherwise. You can rest assured that, for better or for worse, my intent is not some unspoken attempt to turn you to religious commitment. I am fully convinced that, whatever the nature of science,

there is nothing there forcing you to be a Christian. You can also rest assured that the very last thing I want to do is to make a case for political or pragmatic reasons. I am certainly not going to make any arguments because I think they will play well in Peoria – or, more precisely, in the churches of Peoria. I am a philosopher, and, like most of my ilk, I am a bit of a snob about these sorts of things. I truly believe that the quest for understanding is in itself a noble enterprise. Expectedly, therefore, what does motivate me here, despite the fact that much of this book is more history than anything else, are some very traditional philosophical concerns. I am simply interested in the nature of science, its scope and its limits – and, in the light of this, in what the Christian can then legitimately say and claim. If things are genuinely in opposition to science, then so much the worse for them. But I believe that we do science a disservice by placing it in false opposition to other things in life and culture, especially other things that many people hold dear.

My approach to philosophy is that of the naturalist. My interest in limits does not belie my belief that the highest form of knowledge is scientific knowledge. I want to make my philosophy as much like science as possible. Where the scientist takes the physical world (including the organic world) as his or her datum, I take science as my datum. I am also an evolutionist. I do not much care for simple analogies between the history of organisms and the history of science, but I do believe that the key to understanding the present is understanding the past. Therefore, much of this book will be historical. It will not be a history of the science-religion relationship as such. Rather, it will be a history of science itself – very selective, obviously, but I trust sufficiently comprehensive to make the main points without too much fear of distortion because of biased focus. Only when this is done will I be able to turn to my philosophical analysis and see how, in the light of my findings, we should regard the Christian religion. I should say that a major reason for my restriction of the discussion to (Western) Christianity stems from my historical approach.It is against this religion that science has grown and defined itself in the five centuries since the beginning of the Scientific Revolution. I suspect that my conclusions can be generalized to other religions, but that is a task for another person at another time.

The subtitle of this book starts with reference to a comment made by Immanuel Kant in the Preface to the second edition of his

masterwork, *The Critique of Pure Reason*. "I have therefore found it necessary to deny knowledge in order to make room for faith." I am not a Kantian. In many respects, I feel more comfortable with the philosophy of David Hume. I am certainly not going to deny knowledge as such, but then neither did Kant. He wanted to show its limitations, particularly the limitations of a science-based knowledge. That is my aim, too. The subtitle continues by adapting the name of a group of people (including me) interested in the science-religion relationship: The Institute on Religion in an Age of Science. Mainly liberal Christians, these people are as modest as the title of their group is pretentious. In labeling my book as I do, I show my respect and affection for men and women I am proud to call my friends. My dedication is to a man who has contributed more than any other to an understanding of science, of religion, and of their relationship. His writings and his friendship have made my life much richer than it would be otherwise.