LET THERE BE SCIENCE

WHY GOD LOVES SCIENCE, AND SCIENCE NEEDS GOD

David Hutchings and Tom McLeish

LION

For the glory of God: Father, Son, and Holy Spirit.

Published by Lion Books
an imprint of
Lion Hudson plc
Wilkinson House, Jordan Hill Road,
Oxford OX2 8DR, England
www.lionhudson.com/lion

ISBN 978 0 7459 6863 6
e-ISBN 978 0 7459 6864 3

First edition 2017

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A catalogue record for this book is available from the British Library

Printed and bound in the UK, December 2016, LH36

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FOREWORD

"I wonder as I wander out under the sky"

So begins one of the best-loved Christmas carols. *Wonder*. It is the beginning of both science and the Christian faith. Wonder that the world is as it is, in its beauty, majesty, and glory. Wonder also that "God so loved the world that he gave his only Son, so that everyone who believes in him may not perish but may have eternal life."[1]

Wonder like this can only find expression in praise. As the biblical Psalmist writes, "I praise you, for I am fearfully and wonderfully made. Wonderful are your works; that I know very well."[2] We are indeed wonder-fully made – God has made us to be full of wonder for both him and his works.

Just as Augustine says that "God has made us for himself, and our hearts are restless until they find their rest in him,"[3] God has also made us for this world, and our minds are restless until they find their rest in its truth. For, as we explore and discover more about the world, we come to know more about God's wonder-full works, and so come to know God himself more and more. Thus, in doing science – in seeking the truth about the world around us – we worship God.

And this, then, is why faith provides such a natural environment for science to flourish – as the authors of this book maintain. They show, through stories about faith and science, that rather than faith being the enemy of science (as many of the "cultured despisers" would have us believe) faith *nurtures* science, watering its roots so that it may bear fruit; fruit that will last.

Now, this fruit isn't merely the satisfying of curiosity – the scratching of an intellectual itch – but rather, just as faith leads to action, so does science. God has given us the gift of science, and the gift of faith to nurture it, so that we may actively engage the world, making it a better place not only for ourselves but also for those who come after us. This is part of what it means to be human; and science, along with and supported by faith, is right at the heart of it.

I commend this book to all who would like to know better how faith is fertile ground for the growth of science. But in closing, I would like to say more generally that faith is an environment not only where science thrives, but also where human life thrives. We are

all pilgrims, wandering in this world. There will be a time, however, when our pilgrimages come to an end: in that place of joy which "no eye has seen, nor ear heard, nor the human heart conceived, what God has prepared for those who love him."[4] And there, all our wanderings will cease – for, though "we know now only in part, there we will know fully, even as we have been fully known."[5] And, in turn, science will come to an end; for not only will we know the mind of God, we will see him face to face.

The Archbishop of York, Dr John Sentamu

PREFACE

Dave

The whole thing is almost depressingly predictable. Each school year, the students I teach find out that I believe in God – either because they have asked me outright or because it has turned up in conversation somehow. From then, I can count it down:

3… 2… 1…

"But you're a *science* teacher!"

It isn't their fault, of course. Somehow, even before their mid-teens, they think that you just have to pick a side – God or science. Who has told them this? Science-hating God-people? God-hating scientists?

Either way, it doesn't take long to establish that there hasn't been much real thought involved in their forming of the "it's either God or science" conclusion – it has just sort of happened. A few simple questions expose the truth that they have ended up believing it without really knowing why. I suspect that it is because someone, somewhere, has been doing the media-based equivalent of shouting aggressively at whoever happens to be nearby – and that my students, like everyone else, have picked up the echoes and settled for that.

What might happen, though, if we stopped with all the shouting? What if we just talked, and listened? Might Bible-believing Christians have something to say to scientists that is not just interesting, but actually beneficial to real-world science? Might scientists have something to say to Christians that could help them live out their day-to-day faith more powerfully?

Even in those questions, we see a false split, for there is no need for an individual to be one or the other. There are many scientists who are also committed Christians. The shouters, of course, don't want people to know this, and especially not to think about it; which is precisely why they shout. The problem, however, is that it is a fact, and facts are powerful things – they need to be dealt with.

Yet how can this be done, and done well? The temptation is to join in as loudly as others have – but that is only really likely to make things worse. Shouting sets people up against each other and breaks down both conversation and thought. A handful of teachers encouraging a handful of students to think the God-science issue through more carefully might make a small difference, but it certainly won't bring about wholescale change.

Is there, maybe, a way that we can let all the echoes die down

slightly and start afresh? Can we give everyone – students, scientists, priests and pastors, and none of the above – a new beginning? Might they be gifted the chance to start thinking, in an environment that permits even the gentler voices to be heard, about how God and science relate to each other?

It was with questions like these working their way around my head that I found myself, a few years ago, listening to a lecture on Astrophysics. The talk – "Black Holes, White Holes and Worm Holes" was expertly delivered by Dame Jocelyn Bell Burnell, a legendary figure in physics, known best for her discovery of pulsars. Had justice been done, in fact, she would have a Nobel Prize for it – but, as we will go on to see in this book, the world of science yields up just as many failures and missteps as any other. It was at this lecture's after-party (yes, there really was one) that I first met Professor Tom McLeish.

I had just been having a discussion with Dame Jocelyn about God – thankfully, she is most certainly not a shouter – so my mind was already on such things when Tom walked over and mentioned a book he had just written. It was about Christianity and science, he said. I find myself thinking of this as a divine encounter of some sort – I bought a copy and, in the ensuing months, some wonderful answers to my wonderings about fresh starts began to emerge. To see why, and to get a little more background, it only seems fair to hand over to Tom himself…

Tom

For several years, this scientist and Christian had, like Dave, become increasingly frustrated at the amount of defensive writing in "science and religion". The ever-present, "How can you reconcile the conflict between science and faith?" seemed to start from the wrong place, and assume all the wrong things. I wanted very much to think out loud more about questions that went along the lines, "What is science for *in God's great project?"*

Implied in this "science within Christian belief" approach were two other necessary things. We would need to listen to the great thinkers about the natural world throughout history, especially those whose love of the natural world evidently sprang from their faith. Excitingly for science, this "long view" also shows that it is much more deeply human than the "science is modern" view that I had been sold as a student. It also meant a fresh approach to the Bible. While the book of Genesis is a wonderful document about God's creation and covenant, it dawned on me that it doesn't contain the Bible's simplest creation stories, nor the most important material on how to think about nature. That seemed to be in the less well known (and much *less talked about) "Wisdom" books. Special among them is the even less-well-read Book of Job, whose probing celebration of the natural world*

I love. That all lead to the book, Faith and Wisdom in Science *– the one Dave went and read.*

I wrote that first book with a graduate reader in mind – its language comes from the university world I inhabit and work in day to day. But the message and ideas – that we can think Biblically about science as God's gift, as a talent to turn into many-fold returns as the world, and that this can transform the way we think about science – can be chewed-on by anyone. In particular I had realised that Faith and Wisdom in Science *had serious consequences for education and the media. Andrew Hodder-Williams from Lion Hudson (incidentally an old school friend) had approached me about writing for a wider readership, including those of any age who may not have studied or embraced either science or faith in any meaningful way. I just didn't think I would be able to do it very well. I needed a co-author. If only I could find, say, a school science teacher with a gift for writing and who shared my passion for science within God's Kingdom…*

Dave and Tom

The result of this, hopefully, is a book about what we might be able to hear underneath all of the shouting. It is a book about what Christianity says about science, and about what science says about Christianity – all through stories of interest to readers of all faiths or none. It seeks to pick up on what has, all too often, been drowned out by the noise: that science flows naturally from the Christian worldview, and that it always has.

How sad it is that this extraordinary relationship has been almost completely lost in inaccurate or over-emphasised tales of the prejudices, mistakes, and terrible deeds that have sometimes arisen in the name of either faith or science. For every disaster, there are a multitude of remarkable success stories, nearly all of which seem never to be told.

It is time, now, for this to be remedied. The Bible's message speaks of a God who loves science and of a science that needs God. Again and again, this has been proved to be true in the real world of physics, chemistry, and biology. This is a book about those instances and the wonderful message which is threaded through each of them: that science is a gift from God, one with unlimited potential for good, and we are all to treasure it greatly, whether experts or not.

Great things can happen in relationships whenever people are prepared to stop shouting. Maybe, one day, things could be different in classrooms, laboratories, churches, and pubs. Perhaps we can become a society that thinks and talks about facts, and

not just echoes. That the Big Picture of Christianity and the practice of modern science weave together beautifully is, putting it simply, true.

So, let's seek out these two – science and faith – in all of their fullness, and rediscover that beauty ourselves.

Tom

I'd like to thank Dave for taking this project on and for writing mostly everything (the reader should know this). We'd both like to thank Andrew Hodder-Williams, Jessica Scott, and especially Becki Bradshaw at Lion for their encouragement and hard work. The most loving supporters of projects like this as well as the most sensitive critics are the close family who also have to put up with it; without all that from my wife Julie and our children this wouldn't have happened.

Dave

Since I have never really done anything like this before, I have very many people to thank. Tom, Becki and Andrew have, I feel, taken a risk in working with a newbie like me, and I am hugely grateful for that. Their advice and patience has been much needed. My wife, Emma, has taken much of the brunt of the book – having to read countless excerpts, put up with my absence, listen to my ramblings and humour me almost constantly. She has done this whilst also looking after a toddler (Bethany) and a baby (Chloe), although they have probably caused her fewer difficulties than I have. I couldn't have done any of this without her.

Others who have helped with the manuscript in significant ways are Joshua Crosby, Becki Dean, Ed Hambleton, and Liam Maxwell. Their feedback has been vital in producing what we have all now ended up with. Colleagues at Pocklington School have also been key aids; they shall have to be satisfied with being listed by their initials: IHA, MJA, MJD, AWJH, GJH and LAL. I promised to mention one of my Physics A Level classes, L6Q, who were refreshingly honest with me about whether what I was writing was even remotely interesting. (In return, may I remind them now, they have promised to buy a copy each). Of course, I also owe a huge debt to my parents, in particular for their constant encouragement and prayers. Finally, Lawrence Osborn – our copy editor – was both flexible with timings and wise in his analysis of the text. Thank you to all.

Thank you

1

TURNING THE LIGHT ON

> He who walks in the darkness does not know where he is going.
>
> **Jesus of Nazareth**

> Shin: a device for finding furniture in the dark.
>
> **Steven Wright**

Finding the best path across an unlit and cluttered room in the middle of the night is a potentially tricky business. The horrors of a stubbed toe or of treading on something sharp are only ever one unlucky step away. The solution is obvious, of course, provided it is available: turn the light on. The newly illuminated surroundings can now be taken in – plotting a course is made much easier.

Writing something new about science feels a little bit like this crowded-room scenario, especially since this book will deal with some controversial subject matter. What exactly, we shall ask, *is* science? What is science *for*? Do these questions, interesting though they might be, really make any practical difference? Would knowing the answers actually change anything for the average scientist?

Unsurprisingly, the room these questions occupy is a hazardous one. It is already stuffed full of furniture, and there are oddments all over its floor. Stepping out into it will mean putting feet and shins at serious risk – and only more so if we allow the ideas and language of *faith* to have any involvement.

A thoughtful and careful look at the big-picture story of science, though, shows that the topic of faith is simply unavoidable; it crops up again and again. In fact, at times, faith appears not just to be part of the mix, but central to it. Although this might seem unexpected at first, a bit more exploration reveals what is at least a partial explanation: science – so often presented as a detached, almost robotic undertaking – turns out in reality to be startlingly, and wonderfully, *human*.

When it comes to real-world science, as we shall see, it is no exaggeration at all to say that personality (with its worldviews, instincts, and quirks) has made at least as much difference as rationality. Throughout history, religious beliefs have consistently informed – and sometimes even brought about – new and successful scientific theories. The Christian faith, in particular, seems to be able to provide an environment in which science can positively thrive. If we are serious about answering the big questions laid out above, we cannot really afford to ignore these considerations – on the contrary, we should investigate them further.

As we do so, we will discover that there are many good reasons for the positive effects of faith on scientific endeavour. Chief among these is the provision of a powerful underlying *reason* for doing science in the first place – one that is so powerful that it is unparalleled anywhere else in human thought. This key principle of purpose has led to Christianity being intimately involved with – in some cases being directly responsible for – many of the biggest leaps forward in scientific history.

Maybe, then, it is not actually all that unscientific to hear faith speak as we seek to evaluate and then support science – it could prove to be a more useful travelling companion than some might have thought. Perhaps our seemingly inbuilt love of wisdom about nature really does have some sort of ultimate, faith-related significance. Can Christianity – and its key text, the Bible – help us, in some tangible way, to understand science better? Can it speak on what science *is*? Can it speak on what it is *for*?

Before we start answering these questions, however, it might be wise to ask one more: what ideas are already out there about science? After all, many voices have spoken out about its role or its value or its relationship with human beings, and it would be wise to hear these first. In this opening chapter, therefore, we will do just that.

Let us think of this initial listening process as turning the light on and surveying the room. For only once we have done so, will we be ready to plan out our route; a route which will – if it is the right one – bring us safely to a better place.

Science, Faith, and Hard Words

There is little doubt that the word "science" seems to come with strong images and ideas attached to it. Parents' evenings at schools are full of surprised mums and dads declaring that they "never really *got*

science" after being told their offspring is doing quite well in physics. There is the definite notion that some (odd) people are just "good at science" – unlike the rest of those mere mortals who will work in "normal" areas like retail, manufacturing, the leisure industry, or some form of office work.

Ask people to associate words with "science" and their responses reinforce this idea: "difficult", "boring", "mad scientist" all crop up. This does not necessarily mean that science is unvalued, though, since other answers are "experiment", "proof", and "curing cancer". Instead, it seems that science is viewed as useful, but complicated. Is this true about other complex human activities? What if we try the same process with "music" or "art"?

This time, answers are far more *personal*. They might be a favourite song or a feeling – there is far less sense of distance or threat. When most people talk about science, they do so from a position of wariness – it is part of a different world that they feel they can comment *on* but not really take part *in* – and yet other subjects are seen as more comfortable and accessible. We could, therefore, call science a "hard" idea, and these others "soft".

What about our other key topic, faith? Is it hard or soft? Words like "trust", and "belief" sound somewhat promising, but do not push faith clearly into one category or the other. Expressions like "blind faith" and "extremism", however, are certainly nearer the hard end of the spectrum.

When considering the interaction of faith and science, then, we might be entering grounds in which people have strong ideas, even if they don't have a high level of personal involvement in either area. The atmosphere in which the two meet could be highly charged at times, and this book finds itself right in the middle of it – so paying attention to what has been said before will be very important.

It is perhaps most obvious to start with the scientist most often associated with this meeting-point, Richard Dawkins. He is quoted often, partially because he is so strongly spoken. Take, for instance, his comments during a live webchat on the *mumsnet* website:

> If children understand that beliefs should be substantiated with evidence, as opposed to tradition, authority, revelation or faith, they will automatically work out for themselves that they are atheists.[1]

It is a relatively simple point: *evidence* (which comes from doing science) is *opposed* to *faith* (which, according to Dawkins, contains

no evidence) and leads to the obvious conclusion (since a child can arrive at it) that there is no God. For Dawkins, science and faith are enemies, and science must win out in the world for us to progress. He is far from being alone in this view, with the more active supporters of it being dubbed the "New Atheists". Peter Atkins, a former professor of chemistry at Oxford University, is unafraid of adding his voice to Dawkins':

> It is not possible to be intellectually honest and believe in gods. And it is not possible to believe in gods and be a true scientist.[2]

These bold announcements, however, have been challenged by the very creatures that Peter Atkins does not believe exist: true scientists who do believe. Alister McGrath, himself a professor at Oxford, is both a biophysicist and a theologian. As a former atheist, he writes that the evidence for God can be found repeatedly within science:

> The Christian faith… allows us to see further and deeper, to appreciate that nature is studded with signs, radiant with reminders, and emblazoned with symbols of God, our creator and redeemer.[3]

Such back-and-forth between supposed enemies has generated hundreds of books, YouTube videos, podcasts, and university debates. Some titles give a sense of the discussion: *The God Delusion*, *The Dawkins Delusion*, *Faith vs. Fact*, *Gunning for God: why the New Atheists are Missing the Target*, and so on. Each new publication seeks to build the case further for either the death or the defence of faith, with science being hauled in to flesh out the argument.

As a side-effect, all this has led to a fear of science among some religious communities. Battles have been fought in the USA over exactly what should appear in textbooks and whether certain scientific ideas should be allowed in the classroom, depending on the persuasions of the groups running any particular school.[4] There is a real sense of anxiety, frustration, and sometimes outright anger as those on either side worry about the possibility of wrong ideas damaging young minds.

Although the religion–science tension is a major headline grabber, it is not the only science-related area in which strong opinions are held. We have identified a large piece of furniture in our darkened room, yes – but it is not the only one.

Science the Saviour

To many people, science offers hope. As those clever scientists in white coats work away in the lab, they discover new facts and new techniques which will bring us closer, every day, to a perfect world. The major victories of science in the past remind us that great things can be achieved, and it becomes possible for some to believe that all of our problems will eventually be eliminated by the power of the scientific method. It is a hope that lies behind these words from Pandit Nehru, the first prime minister of India:

> It is science alone that can solve the problems of hunger and poverty, of insanitation and illiteracy, of superstition and deadening custom and tradition, of vast resources running to waste, of a rich country inhabited by starving people.[5]

Here, science itself is the hero. It is easier to hold this view as a non-scientist, since the pressure is firmly placed on the shoulders of those in the profession, but many scientists see things this way too. Royal DSM, a life-sciences company based in the Netherlands has a website entitled "Science can Change the World". It reminds visitors of successes against smallpox, acid rain, and the hole in the ozone layer. This triumphant message champions their staff:

> A handful of inspirational people – that you've probably never heard of – are proving that science doesn't just change the game. It can change our world.[6]

Is this optimism and positivity justified? Is it true that science is the process by which people with big ideas and big brains save the world? Would it be more realistic to say that this is a rather rose-tinted picture, or even a way of handing over responsibility to anonymous laboratory superstars? Whatever the answers to these questions, there is at least one other reason that our governments have put forward for doing science – saving the world, it seems, is not always enough.

Science the Moneymaker

Money talks – and we could hardly expect science to carry on without listening. With eighteen of the top one hundred companies in Britain being directly involved in the sciences[7] (and many others indirectly

linked), there is clearly cash to be made if you can get your experiments to work well. These organizations spend almost unimaginable amounts on squeezing a few more decimal points of efficiency out of their devices, or on updating them with an all-new version.

Take, for example, the average cost of bringing a single new pharmaceutical drug to market: *Scientific American* magazine calculated it to be a staggering £1,700 million in 2014.[8] This many pound coins stacked as a tower would be as tall as 600 Mount Everests; laid out in a line, they would almost completely encircle the Earth. Alternatively, and undoubtedly more usefully, every single person in the world could be given 23 pence.

These extraordinary numbers are not lost on leaders around the world. They know very well that science and money go together. Here is why the UK government thinks it should fund scientific research:

> The mission of each research council has been changed to meet the needs of users and to support wealth creation… thereby enhancing the United Kingdom's competitiveness and quality of life.[9]

This is almost unexpectedly honest. There is no mention of saving the world, unless perhaps that is what is meant by improving quality of life. It could be argued that "meeting the needs of users" could be about winning victories over suffering, but there is no denying the strong economic nature of the statement. The government will put money into science, yes – because it believes it will get even more money back out.

Interestingly, this line of argument is not only found in parliamentary papers: it is also used to persuade young people to study science. The top five subjects for graduate salaries in the UK are all sciences, as are nine of the top ten. The Institute of Fiscal Studies ran a presentation in 2013 with the rather clunky title *Why you should study maths (and science and computing) at A-level*. After working through over thirty slides of monetary calculations, they concluded: "it is very likely to earn you more money!"[10]

Science the Spoiler

Most people would not know the name Val Valentino, but a significant number have seen him at work. He is the Masked Magician who decided to expose the workings of numerous magic tricks commonly

performed by other illusionists. His TV show, *Breaking the Magician's Code: Magic's Biggest Secrets Finally Revealed*,[11] followed a fixed format – the Masked Magician would perform the illusion as it was originally intended and then (after a commercial break, of course) would do it again, this time showing the method.

Watching this programme could bring forth a variety of emotions: excitement and bewilderment at first, speculation and curiosity before the reveal, satisfaction and closure when enlightened. Not everyone, however, felt fulfilled. In fact, many didn't. The final revelation, which seemed to promise so much, often led to disappointment.

The teleporting girl, it turned out, was actually an identical twin. The coin entered the bottle through a secret hole in the bottom. There was a trapdoor under the casket. The levitation used strong, thin wires. The problem with all of this was the loss of a sense of wonder. It is more fun for many, it would appear, *not* to know what is going on. Commenting on a YouTube video of the show, a user called *cromthor* writes:

> In spite of what we all feel (we WANT to know the secret), our pleasure as spectators is to be fooled, to see something that's IMPOSSIBLE! We want to know the secret, but once we do, let's face it: we're disappointed and our pleasure is gone.[12]

Interestingly, some eminent figures from history describe science in almost the same way. John Keats, the great Romantic poet, would probably empathize with *cromthor's* comment. We see the same type of complaint in one of his poems, "Lamia", from 1820:

> Do not all charms fly
> At the mere touch of cold philosophy?
> There was an awful rainbow once in heaven:
> We know her woof, her texture; she is given
> In the dull catalogue of common things.
> Philosophy will clip an angel's wings,
> Conquer all mysteries by rule and line,
> Empty the haunted air, and gnomed mine
> Unweave a rainbow.

Keats's protest is that science is acting like the Masked Magician. It takes elements of the world which inspire wonder and, in explaining them, strips away their magic. As far as Keats is concerned, science ruins things that were once beautifully mysterious, mutating them

into nothing more than boring scientific laws or information. Science, he says, unweaves rainbows.

Science the Monster-Maker

Another Romantic icon – Mary Shelley's *Frankenstein* – is proving to have a far deeper influence within modern, cutting-edge science than might have been expected from a novel written in the 1830s. A cautionary tale, in which a monster is created by Dr Frankenstein using "science", it has been hijacked by mainstream media. They use it to express concerns about the damage scientists might possibly be doing as they meddle with natural processes.

Ignoring the actual point of the book (it is only when the monster is unloved and dismissed that he becomes a threat), the story has now become that science is often unnatural and will lead to disaster of some sort. Playing on this fear, it is now standard journalistic style to add "Franken" to the start of different words, forming a new "science-is-bad" vocabulary. Frankenfoods (those that are genetically modified) are the most common example, but other applications include Franken-tadpoles (with eyes on their tails) and Franken-water (recycled from human waste).[13]

This is a deep-seated narrative in our culture. We worry that "messing with nature" will cost us heavily in the long run. A newly published book by Jean-Pierre Fillard asks whether we might be happily bringing about our own end as a recognizable species – it has the terrifying title *Is Man to Survive Science?*[14]

The hugely successful novel-turned-film *Jurassic Park*[15] grabbed hold of a similar idea and ran with it. The Park's team of technicians use "science" to bring living and breathing dinosaurs into the twentieth century. In a key scene, the man funding all of this research is sternly warned by one of the wisely sceptical heroes: "Your scientists were so preoccupied with whether they could that they didn't stop to think whether they should."[16] As the plot develops, his fear is shown to be valid. Science, we learn, makes monsters.

Science the Odd Family Member

It almost seems a rule that, at every extended family gathering, there is one person present who is not quite operating on the same social level as the rest. He or she is welcome, yes, and even enjoyed – but as

some sort of curiosity, almost like an exhibit. The quirky enthusiasm and utterly confusing stories are entertaining for a short while, but are really only tolerated because these gatherings don't happen so often.

This is often the treatment reserved for science and scientists in the media. Take, for example, a recent edition of BBC Radio 4's *Today*.[17] It is not unusual for this programme to deal with very complex and subtle ideas related to the arts, the humanities, or politics, and this one was no exception: it discussed, in depth, the philosophy of a French novelist.

By contrast, when scientists were asked to speak about exploding galaxies on the same programme, they were told off for using "difficult language". The term that caused offence – "a simplifying assumption" – was far more straightforward than many of the earlier philosophical phrases.

Similarly, BBC Radio 5 Live's *Seven Day Saturday*, a quick-fire comedy show covering economics, politics, sociology, and more contains a section introduced with the following jingle: "Here comes the science bit – concentrate!"[18] This is more than just a claim that science is difficult, it seems. The implicit suggestion is that science is somehow *different* to other difficult ideas. Perhaps this explains why science and scientists are often treated as a bit of light relief when they turn up in a studio. They are wheeled in to pronounce some fact or another, and the following interactions with the hosts are usually either awkward or comical. The message is clear: science is not "normal".

Science the Spooker

People can occasionally be hit by a profound revelation: there is an awful lot out there in the world about which they know precisely *nothing*. Questions might range from "how do clouds stay in the sky?" to "who or what am I?" Stopping to think like this can be scary – the questions can get big quite quickly. "What kind of universe do we live in?" "Is there a 'big picture', or not?"

Science is unafraid to tackle questions like these, and it can be tempting to just let scientists get on with it – but, on occasion, there remains the nagging sense that that is not going to be enough. Take the experience of author Bill Bryson, for instance:

> I was on a long flight across the Pacific, staring idly out the window at moonlit ocean, when it occurred to me with a certain

> uncomfortable forcefulness that I didn't know the first thing about the only planet I was ever going to live on.[19]

Not prepared to let this thought go, Bryson decided to do something about it, which resulted in the wonderful book *A Short History of Nearly Everything*. Yet, for every new book spawned, there will be thousands of people who stay quietly spooked as it dawns on them that they don't know the answers to some questions that might just be very important.

George Steiner, the hugely influential thinker, has also been unsettled by the mysteries of the material world around us. He, however, came to the conclusion that scientific study cannot then "unspook" us. Resolution, he says, must be found elsewhere:

> Only art can go some way towards making accessible, towards waking into some measure of communicability, the sheer inhuman otherness of matter…[20]

Steiner is deeply bothered by the "inhuman otherness" of the universe, but has given up on science as the tool to deal with it. Thinking about science, he implies, can certainly get us spooked – but *only art* provides any meaningful answers.

Plotting Our Course

Let us review our findings. What have we seen, now that the light is on? The what-is-science-and-what-is-it-for room has indeed proved to be a cluttered one. Even a quick glance around has revealed several large items that need to be taken into account. To some, science is the enlightened arch-enemy of faith, or the saviour of the world, or a money-spinner. To others it is a rainbow-unweaver, a monster-maker, a quirky uncle, or a quietly haunting spectre.

Our claim in this book – that doing science is a fundamental part of what it means to be human, and that it works best when understood as a gift from God – will have to speak to each of these different views. We need, therefore, to pick out a route that allows it to do so, hopefully without striking our bonier body parts on something hard or sharp.

For this reason, we shall take the approach, throughout, of using *stories*. Stories get us thinking about *people* – their motivations, hopes, or pain; their moments of inspiration or moments of disaster. Stories

are how we best understand ourselves and our beliefs. Stories, as we shall see, can be key in the search for a bigger picture.

In Chapter 2, then, we will consider the history of science. When did science really begin? Was it with the computer? With electric circuits? With gravitational theory? Or, perhaps, might science be much, much older than any of these?

In Chapter 3, we will look at the remarkable fact that human beings can even do science at all, and in Chapter 4 we will investigate the process of scientific revolution – how, in reality, does one theory totally overhaul another? Chapter 5 will address the very real (but often hidden) fact that science does not always go smoothly and is often the cause of great pain – and that, despite this, scientific hope persists.

Chapter 6 deals with the still-developing understanding that, in our world, order consistently emerges from apparent chaos, even at the very deepest levels of our current knowledge. Time and again, we find that the uncertainties in this world also make it a suitable home for us – could this point us to a further, more profound truth?

In Chapter 7 we study the importance in science of asking the right questions and then, in Chapter 8, the even greater importance of *love*.

In each of these chapters, our science stories will intermingle with faith stories – the two are bound together far more tightly than some modern commentators might have us believe. The big pictures painted by the history, the people and the findings of science look very much like those that emerge from the pages of the Bible – and we will go on to find, in Chapters 9 and 10, that this connection might just be of universal significance.

So, we have turned the light on and looked around the room. We have planned our course. It is time, now, to step out and start our journey. What *is* science? What is it *for*? And what, perhaps most significantly of all, does all this have to do with *faith*?