Science and Faith:
What is the problem?

The Limits of Science and
The Challenge of Faith

A physicist and a theologian explore the limits of science and the challenge of faith in God in a postmodern world. A resource book for senior students, teachers and anyone who cares about the future of the planet and how we live on it.

Richard A Prideaux

&

Anthony R Pepper

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About the authors

Anthony (Tony) Pepper, BSc, PhD, DipEd, a foundational PhD candidate at Monash University, Clayton, taught Physics at Malawi and Waikato (New Zealand) Universities and later in a number of Catholic and Independent Schools in Victoria. He has published in scientific and educational journals and always maintained a keen interest in moral and religious issues, challenging both students and teachers about the way we think, learn and live. After his retirement and until his death in 2011, Tony developed an ecologically sustainable small farm in Gippsland.

Richard Prideaux, BA DipEd, ThL (Hons) BD (London, Hons), MA, has a passion for History and Philosophy of Science, Literature and Theology. He was Head of Religious Studies at Ivanhoe Grammar School, Victoria, then spent 14 years as Principal of St Paul's Anglican Grammar School, Warragul where his conversation with Tony Pepper began. Richard is currently Campus Principal of Beaconhills College, Pakenham, has been Chairman of Council at Ridley Melbourne, and is a Fellow of ISCAST. Richard agrees with Einstein, that science without religion is lame; religion without science is blind.

Chapter One

A scientist begins with some start(l)ing ideas

Tradition demands that at some time in your life you go outside on a clear night and simply look up at the sky. Country people will see a clearer picture than do their urban cousins, perhaps recognising the Milky Way and the various constellations presumably named by early scholars who could observe and who perhaps tried to interpret what they saw in terms of their limited knowledge of their world.

The sheer number of stars and the apparent vastness of the spectacle are likely to overawe even the most self-confident. You may feel insignificant, you may marvel at your place in so vast a scheme or you just may wonder 'what's the point?'

Children may try to count the stars. Those who have studied some science will believe that each of those points of light they see is another star like our sun, not a hole in a big inverted basin which gets put over us at night — which is much more likely, isn't it?

A modern sceptic could be excused for asking if it is another example of virtual reality projected on the inside of his eyelids, or an advertising stunt of some kind.

If you believe the 'stars' explanation, you may get to wondering whether other suns have planets, whether other planets have life-forms like us, more or less advanced than ourselves, or whether we are terribly alone, an improbable cosmic accident.[1]

You may realise that other life-forms could be studying us, now that we have started — comparatively recently — sending out signals from radio and television transmitters. In this case you may be reassured by the fact that you are not seeing the universe out there as it is, but as it was. No, not even as simple as that, because we are seeing each star by the light that left it anywhere from a few years to thousands, millions, even thousands of millions of years ago.

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[1] S Conway Morris, *Life's Solution: Inevitable Humans in a Lonely Universe,* Cambridge, CUP, 2003

Even light takes time to travel the vast distances involved. So what you see is a complex image in which individual stars appear as they once were, at a particular time, different for each star. It's quite possible that you see stars that no longer exist. If one were to disappear, you couldn't find out until its light no longer reached you — which could be millions of years later. This is because, as far as we know at the moment, information can travel no faster than the speed of light. Science fiction heroes, of course, have access to instantaneous messages…

Meanwhile, this makes it difficult for scientists to talk about the Universe as it is 'now'. The chances that the signals we sent out have already reached an intelligent race who can interpret them seem fairly remote, so we probably have time to make sure what we broadcast shows us in a good light. Perhaps there are aliens who know about us already; perhaps it was they who put us here, like some laboratory animal in some great experiment — just as the mice conducted the experiments in *The Hitchhikers' Guide to the Galaxy*.[2]

On a more serious note, if you stay outside for a long time, you run the incredible risk of thinking really deep thoughts, about why you are here, why the Universe is out there, where it came from and where it is heading. It may be cold comfort to realise that you are not the first person to do this, that you probably won't be the last, and that you are about to join the vast number of human beings who have asked this type of question and not been able to find an answer. Welcome to the Human Race, a group of strange creatures who are prepared to consider questions to which the answers are difficult, which will not be found out at all soon, or for which the human brain has inadequate capacity. If you give up simply because it is too difficult, you will disappoint generations of teachers who have found teaching worthwhile largely because of the 'WOW' factor which occurs when a student perseveres until it **does** make sense, the penny drops, the bulb lights up… If there were a creator of the human race, perhaps she enjoys that WOW effect too.

[2] D Adams, http://flag.blackened.net/dinsdale/dna/book1.html

If you are inclined to be a hermit, you may now wish to retire to your cave and commune with your own thoughts. If you are gregarious, you could talk with your friends, and it may help to search for the partial answers others have already found. This may give you something to build on and will save time. We all like to believe we have original thoughts, but it is frustrating to find that so many 'original' thoughts have occurred to others — often a long time ago. Alternatively, you may wish to avoid any bias which could occur in the thoughts of others. It is a sobering thought that most of the books on library shelves seem to reach logical but sometimes totally incompatible conclusions.

If you have had the benefit of a modern and comprehensive education, you will probably have been persuaded that everything you are told should be questioned. If you read old science texts, interpretations may have changed as new theories emerge. Are there really canals on Mars, and is Venus really a steamy tropical paradise? Time, a concept apparently basic and obvious to even a genius like Newton, is quoted as the thing we can measure most accurately. Einstein showed that time was a subjective — or at least relative — concept which depended on the observer's conditions. In other fields, uncertainty about what we mean is obscure for other reasons. The recording and interpretation of historical facts may be clouded by bias. There's a famous joke about the able seaman who wanted to get back at the Captain who had logged him as being drunk. So he wrote in the ship's log, *'The captain was sober today.'* The truth is no guarantee of accurate interpretation.

Hence you must test statements for propaganda value, for 'spin', for deliberate or accidental misinformation caused by lack of complete information, and certainly for the persuasion techniques apparently necessary to make you into a consumer. Presumably the hurried shouting of modern ads is designed to prevent you from having a chance to think and evaluate too much. It used to be said that the devil makes work for idle hands; perhaps nowadays the devil does better by not allowing opportunity for people to simply sit and think. We have been told we are entertaining ourselves to

death[3] — or at least to dumbed-down thoughtlessness. We need to be wary of the knee-jerk response in arriving at an appropriate conclusion.

We live in a world of multimedia presentations, where our eyes and ears can be bombarded simultaneously by what someone else thinks we ought to know. Why is it that there are always those in society who want you to think as they do? Commercial expediency? A grab for power or conformity? But it remains your right to be allowed to make up your own mind, noting that intellectual honesty demands that you respond fairly to answers or information you find.

'Questioning' doesn't mean you have the right to overturn every rule of law, every accepted moral value, every precept of a stable society. If you believe in evolution (of which much more later) you might perhaps accept that we as a complex society have evolved and remain stable mainly because we have customs and codes of conduct, sometimes enshrined in law, sometimes only tradition, but without which we could degenerate to a mass of individuals governed by self-interest. Who was it who said 'Laws are made for the obedience of fools and the guidance of the wise'?

We seem to be in a 'breakdown' mode of society. Having thrown away many of the old values and traditions which underpin any society, we search for new truths. People are described as 'spiritual', wanting to return to some kind of belief, although not the structured church of their parents' or grandparents' time. To some people 'spiritual' seems to mean that we like warm fuzzy feelings about doing the right thing, but perhaps resent religious institutions. Conversely we are more tolerant of the faith-practices of others, and less able to cope with narrow-mindedness in our own, even if it allows female bishops!

Some institutions in our society have changed, and there are those who wonder whether the breakdown of the model of the nuclear family, for example, is having and will have a dramatic impact

[3] N Postman, *Amusing Ourselves to Death,* New York, Penguin, 1986

on society, particularly its children. Around our world at present are many examples of the devastating effects of the toppling of established law and order. Yet when large scale natural disasters strike we are also reminded how much we are reliant on a structured society for our very survival.

In mathematics, when you thought you had made an error, you may have been told to cross out nothing until you had replaced it with something better. The same could probably be applied to rules and regulations, including the mores and etiquette of social customs. If society has evolved over many generations, presumably the previous structures had some significance in the mental and physical health of humankind. With what can they be replaced? Hedonism? Materialism? 'Pure' science not sullied by belief systems?

Consider a world in which every human being attempted to please him/herself… people searching for excitement or happiness with no other purpose. Wouldn't they have lost the meaning of life! To some people, the image of religion perhaps suggests that you must not enjoy yourself, but do what somebody else knows is best for you. Even so, people can be happy when they accept the need for some rules. Man is above all a social animal and living in a social structure requires us to behave ethically towards others; we accept the fact that we live in a democracy, but that would not be enough for a smooth-running world.

I like the story of the world with only two rules :

Rule 1: 'Don't annoy other people'

Rule 2: 'If you are other people, don't be too easily annoyed'.

This emphasises that we must be aware of something beyond self, maybe even beyond humankind; but many will not accept that 'something' as a reason to accept a God who has rules for us — or does He? We accept humanity; we accept ET — but is there anything else out there?

So you are encouraged to question, but within a framework of rules for ethical debating. This doesn't have to be formal debating which expects you to argue for or against something about which you don't really have an opinion; you are trying to find answers, not

win points. Attacking the person who holds a view different from your own is as old as… I almost said politics. You may simply be admitting the weakness of your arguments. Laughing at someone else's ideas probably means you haven't really understood what they were trying to say.

You must listen, so that you can target the concept, not the thinker. We live in a world in which many ideas are expressed very forcibly by many groups, but we should be becoming more tolerant of the ideas if not always the methods used to promulgate them. Isaac Asimov famously has Salvor Hardin say: *'Violence is the last resort of the incompetent'*.[4] Perhaps one of humanity's key targets is to develop deep and tolerant listening rather than reaching for a violent response to opinions which differ from our own.

In reading this book, it will be important to be able to respond to ideas about the universe, its function and purpose, its beginning and potential end, both bearing in mind the above cautions and also without taking too much notice of the labels attached to the people who talk about them. Yes, be aware of potential bias, misinterpretation, persuasion, as we said, but be aware that children can have quite valid ideas about adults, men about women, and even scientists about God, and theologians about science.

However, watch out for the attempts to throw you the curve ball. If you want an example, try saying, with a straight face, 'That's the trouble with women; they're always making rash generalisations.'

What we would like this book to be is a selection of ideas which may help you in your attempt to reach your own conclusions about the universe, what it means to you and others, why you are here. Is it a great cosmic accident — the universe, not just life on our trivial little planet — or is there a purpose? Are we able, or even do we need to know that purpose, if any? Does a purpose require a Purposeful Being?

Much has already been written about these ideas. We don't wish to be so scholarly that you are either put off completely or expect a

[4] I Asimov, *Foundation,* New York, Bantam Books, 1951

definitive answer. We should point out that the ideas mainly come from others, and what we wanted to do was to make some of them more accessible. In short, this book is yours, not ours, hopefully enabling you to marshal your ideas and avoid being pushed around by those with more confidence in their belief system. A little knowledge may be a dangerous thing, but it's a lot safer than total ignorance or total uncritical acceptance. Whether you are going to argue with or against God, or even Science, you need to prepare yourself some intellectual ammunition.

The same questions occur in every generation, but we expect modern students to work through them much more rapidly — or perhaps just gloss over them and never really understand. Studies have shown that physics graduates may not understand the very basic ideas of electric currents, something they were assumed to have learnt at school. My own experience is that some concepts are always going to crop up as difficult — my physics students have the same problem as the Greek philosophers — what is it that makes a stone keep moving after it has been thrown and left your hand?

Knowledge progresses when we ask questions beyond that knowledge. It is commonly said, 'The only thing we learn from history is how little we learn from history.' Perhaps we don't ask history the right questions. Education has come a long way from the days of rote learning; we now encourage students to question, as long as they will also make an effort to seek answers.

Science seems to want answers that are fitted to a theory, and that other scientists can replicate in experiments. So questions such as 'Is there a God?' and 'What is the Paranormal?' are not respectable in science because they cannot be 'tested'. In religion, some questions have not been permitted because they are heretical.

Is there a basic difference? I find it useful to use this distinction: science seems to concern itself with 'What is man made of?', while religion concerns itself with 'what is man made for?' CS Lewis illustrates this distinction in *The Voyage of the Dawn Treader*, when Eustace claims:

> *''In our world,' said Eustace, 'a star is a huge ball of flaming gas.'* [Ramandu replies:] *'Even in your world, my son, that is not what a star is but only what it is made of'.'*[5]

In a similar way we can ask if a person is no more (or even less) than a set of biochemical pathways.

We have difficulty talking about the concept of life — we don't really know what 'life' is, although 'death' is defined as the cessation of whatever it was! It intrigues me that medical science shies away from the concept of death and resurrection. Many patients 'die' on the operating table and come back to 'life', apparently knowing things they could not have known had they merely been unconscious. Officially, this is not 'coming back to life' but a 'near-death experience'. Are their experiences clues to the nature of 'life'?

Are there any 'correct' answers to questions in the two areas of science and religion? In neither science nor religion am I in favour of an arrogant priesthood which knows everything and will question nothing. For me, such certainty comes from ignorance or lack of imagination, in either religion or science! There is the added trap that those who have the true religion or the correct theory and don't listen to any argument may find to difficult to discuss fairly. Can I have a reasonable discussion with the atheist who can prove that God doesn't exist; the six-year-old boy who thinks that passionate love cannot exist; the colour-blind person who has doubts about rainbows? Why should my mind be chained by the supposed certainty of another? In *The Country of the Blind*, by HG Wells, the only sighted person is ridiculed by the blind who have an understanding of their world which is totally incorrect from the sighted point of view.[6]

So this book is aimed neither at convinced scientists, nor equally convinced theologians, but at those willing to question and think for themselves. Unfortunately, ridicule and pretended contempt are

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[5] Ramandu to Eustace in C S Lewis, *The Voyage of the Dawn Treader* (1952) reprinted in *The Chronicles of Narnia,* London, Collins, 1998 p522

[6] H G Wells http://www.online-literature.com/wellshg/3/

weapons you must expect to face if you ask some questions of some people. In arguments between those holding disparate beliefs, each side wants the other to move in an attempt to get to common ground, instead of both yielding a little.

We would like you, then, to explore ideas, not to force any conclusions, while being prepared to be patient. There may be problems with asking questions — both Science and religion say that there are some questions you should not ask. Many years ago there seemed to be three topics on which it was impolite to comment: money, sex and religion. Now we talk about the first two nearly all the time, but religion is still rather embarrassing for some.

Religion seems to have either remained a taboo topic, or perhaps people just don't care enough to discuss it. As a teacher I have met many fine young people who were able to express their ideas, but when talking about science, for example, they could generally express themselves more clearly than they could on religion. One reason must be that in science lessons we spend a lot of time defining and refining concepts, so that everyone (ideally) ends up with the same idea, the standard idea as it were. In religious education classes one has to be comparative and historical, while some very difficult concepts have to be postponed because even in religious schools one has to allow for individual differences. In science teaching we call this 'talking things through' or concept development. Opponents of RE in schools sometimes use the emotive terms 'reinforcing dogma' or 'indoctrination' to gloss over attempts at concept refinement.

Some questions will be embarrassing, in both science and religion, because answers can't be proved or sometimes because the questioner and answerer have different concepts with the same name. For teachers the best approach is to admit ignorance but assume intelligence, and begin a resource search. Here, science has the advantage because God doesn't have a web page.

Actually, it's probably more subtle than that. In science, we teach the current state of knowledge, and although we stress that ideas change, this doesn't happen very often at the school level. Keen

physics students love to grapple with black holes and quantum mechanics, but it's too hard for most. Science at school tends to be seen as definitive, exact, even dogmatic, not open to question except by very superior scientists. Perhaps it would be better if we showed how often science has changed its ideas. Religion, on the other hand, is seen to be open to question, mainly historical — and thousands of years old — and many modern people feel free to develop their own concepts.

On the bookshelves in your local library you will find many books on philosophy, discussing how to believe and perhaps prove — or not — a set of consistent principles. Other books, in the Science section, will show you how far Science has progressed in finding a set of consistent concepts which are verifiable and which describe the operation of the Universe as we know it. This book is an attempt to baffle the classification system by joining the two sets of ideas together.

We would like to be as low-key and understandable as possible. In addition, much of what we present is our own adaptation of what we have learned over a long period; we did not make a reference note to everything we heard, and we would need to re-read all we have read over the last many years. So references in some sections are few and usually general; if you wish to search further, these days you have the web to help you. We wonder if it is possible to have an original thought, or if we are just bringing together the distilled fragments of ideas we have heard or read about over many years.

We shall try to remove the certainty from both sides of the science religion debate, to allow doubt about the validity of both. The church has been famously wrong on a number of well-publicised occasions, but the 'mistakes' of science are perhaps less well-known. Genuine mistakes have occurred, but fraud has also blotted science's copybook. This has tended to make some investigations less than respectable, and understandably many scientists are not good at going out on a limb with really 'way out' ideas if it could harm a career or reputation. For example this has blocked avenues which I

would like to see investigated, such as ESP and other aspects of parapsychology.

One other aspect of science which is often overlooked is that what teachers and lecturers present is a distillation of ideas often begun many years ago. We expect students to pick up in a lesson or so concepts that past geniuses worked to explain for a long time. On the other hand, our current knowledge can never be assumed final or complete, because another genius may be waiting in the wings.

For example, much of what I learnt at school about magnetism, in terms of magnets and their poles, is currently obsolete — poles don't exist — although there are still physicists trying to find them! The key idea here is that science is not the brilliant summary of the properties of the universe that we like to imagine, presented by learned scholars with dispassionate views about all theories as well as their own. It is a human activity, prone to egotism, bigotry and major mistakes. Once again, we should not just accept everything we are told; we must build in the capacity to discuss and evaluate.

A related issue is that the science we learn in school must be presented at an appropriate intellectual level so many learners never reach beyond the introductory level. Where science is somewhat diluted there is a risk that concepts become so simplified that misunderstanding occurs. Despite many science 'infotainment' sessions, some of which are presented to be in tune with a dumbed-down audience, we end up with 'factoids' that require the efforts of myth busters to unravel. We see how scientists present visually dramatic material in order to gain a foothold in the media, especially TV. Meanwhile steady or even spectacular progress in research and theory is made by brilliant scientists but most laymen are simply left behind.

I am very sympathetic to the idea of Sellar and Yeatman in *1066 And All That.* Their compulsory preface cautions: *'History is not what you thought. It is what you can remember. All other history defeats itself.'*[7]

Perhaps 'history' can be replaced by 'science' for most people.

[7] W C Sellar & R J Yeatman, *1066 and All That,* London, Methuen, 1930, Preface

Even after years of immersion in science I still carry around the basic science as used in this book, even though it has been overlaid by much more advanced ideas. When I was at school we needed protons and electrons and neutrons to explain chemistry. Now we ask if the electrons have smaller constituents which also have even smaller constituents. Tectonic plates were never mentioned in geography, while DNA was a new marvel. Nowadays these words are commonplace; but how well is their true import understood?

I don't want to get bogged down in detail; I want to ask the big questions, but could I understand the answers? For example, I still wonder how and why the rules — and conditions — in the Universe have changed over time. I assume there really were dinosaurs. So, if really big land animals existed at one time was gravity rather weaker then, so that big animals could still get around? Inertia might also have had to be different if such animals could start and stop. Scientists talk about gravity waves; can gravity waves meet and cancel out as light waves do? Did the Earth go through a gravity wave node at some stage?

I rather like the suggestion that as science continues to probe the Universe and find the rules, then God changes them — so that at the current explanations remain correct at one level, but require a deeper level of understanding for progress. This is nicely summed up in a piece of doggerel Alexander Pope wrote:

'Nature and nature's laws lay hid in night;
God said 'Let Newton be' and all was light.'[8]

And in reply J C Squires wrote:

'…it did not last; the devil howling 'Ho!,
let Einstein be', restored the status quo.'[9]

As science progresses, and especially as the ethics needed to control it need to be in the hands of society, not just scientists, we all need to be making an effort to keep up so that we know what it is

[8] A Pope, *Epitaph, XII*, Intended for Sir Isaac Newton, in Westminster Abbey, *The Works of Alexander Pope, Esq* (1797), Vol 2 p403

[9] J C Squires, 'In Continuation of Pope on Newton', *Poems*, 1926

we are trying to control. We don't need to be dumbed-down. On the contrary, anecdotal evidence suggests that the human mind is capable of much more than its current performance.

For example, is there telepathy? Is there any reality in the power of prayer? My own anecdote concerns the healing of the minister's wife after bad burns. The congregation prayed for her and recovery was much faster than usual. The surgeon commented 'If we had been trialling a drug we would have concluded it was having a real effect.' But can one ignore the possibility of perfectly natural variation between individuals? Was the rapid healing the effect of prayer or natural processes?

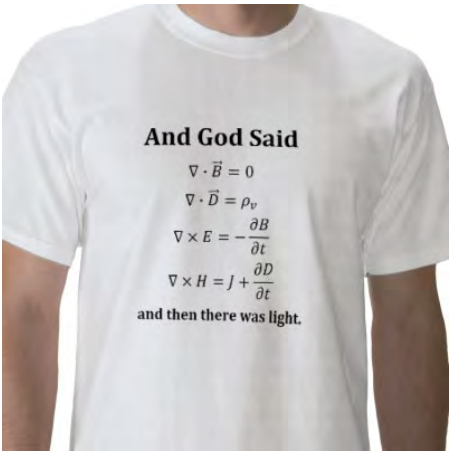
Sceptics doubt prayer which asks for intervention. They say, 'To pray is to ask that two plus two shall not equal four,' or 'To pray is to ask that the laws of the Universe be annulled on behalf of a single petitioner, confessedly unworthy'. This raises the whole question of whether God, having made the rules of the Universe, is allowed to break them on behalf of one of His people.[10] Prayer and miracles are seen this way by some. Miracles may be considered as the occurrence today of the future science we don't yet have — but somebody may. How would people of only 100 years ago react to some of modern technology? Some people use this idea to diminish the miracles of Jesus — did he have access to so-called 'miracle cures' which are commonplace today: restoring sight is fairly routine, even bringing dead people back to life with CPR or more complex procedures.

Science is not the absolute impersonal establishment of understanding. Nor is religion! The basic tenets of science are no more provable than those about God. Many people seem to cling to one

[10] For help with this question see J Houghton, *Does God Play Dice?* Leicester, IVP, 1988; *cf* A Einstein: *'The [quantum] theory yields much, but it hardly brings us closer to the Old One's secret. I, in any case, am convinced that He does not play dice,'* in A Rooney, *Einstein in His Own Words,* New York, Grammercy Books, 2006 p95; and C S Lewis, *Miracles,* Glasgow, The University Press, 1947 esp Ch 8

and not the other. It would be good to go further and remove the wall that divides science and religion. I used to think that you couldn't have both in the one brain. Einstein saw it differently: *Science without religion is lame, religion without science is blind.'*[11]

Some see science as complementary to, rather than conflicting with, religion, as exemplified by the T-shirt below.[12]



Even in fiction we find hope, even if it is science fiction! Ray Bradbury in *The Martian Chronicles* sees a whole race as managing to integrate science and religion.

> [The Martians] *'knew how to live with nature and get along with nature. They didn't try too hard to be all men and no animal. That's the mistake we made when Darwin showed up… And then we discovered that Darwin and our religions don't mix. Or at least we didn't think they did. We were fools. We tried to budge Darwin and Huxley and Freud. They wouldn't move very well. So, like idiots, we tried knocking down religion.*

[11] A Einstein, http://www.sacred-texts.com/aor/einstein/einsci.htm

[12] Maxwell's equations of electromagnetism

'We succeeded pretty well. We lost our faith and went around wandering what life was for. … Faith had always given us answers … We were and still are a lost people.'

'And these Martians are a found people?'

'Yes. They knew how to combine science and religion so the two worked side by side, neither denying the other, each enriching the other…'

And the men of Mars realised that in order to survive they would have to forgo asking that one question any longer: Why Live? Life was its own answer. Life was the propagation of more life and the living of as good a life as possible

They quit trying to destroy everything, to humble everything. They blended religion and art and science because, at base, science is no than an investigation of a miracle we can never explain, and art is an interpretation of that miracle. They never let science crush the aesthetic and the beautiful. It's all simply a matter of degree. An Earth Man thinks: 'In that picture, colour does not exist, really. A scientist can prove that colour is only the way the cells are placed in a certain material to reflect light. Therefore, colour is not really an actual part of things I happen to see'. A Martian, far cleverer, would say: 'This is a fine picture. It came from the hand and the mind of a man inspired. Its idea and its colour are from life. This thing is good'.'[13]

Sherlock Holmes — presumably voicing the ideas of Conan Doyle — puts it like this in *The Naval Treaty*:

''There is nothing in which deduction is so necessary as in religion' said he, leaning his back against the shutters. 'It can be built up as an exact science by the reasoner. Our highest assurance of the goodness of Providence seems to me to rest in the flowers'.'[14]

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[13] R Bradbury, *The Martian Chronicles* (1951), 40th Anniversary Ed, New York, Doubleday, 1991

[14] A C Doyle, *The Naval Treaty* in *Sherlock Holmes Short Stories,* London, John Murray, 1961 p513

Stephen Hawking expresses a hope for a time when all science is known. In the final chapter of *A Brief History of Time* (arguably the most bought and least read book of the 20th Century) he finishes with the stirring words:

'*If we find the answer to that it would be the ultimate triumph of human reason — for then we would know the mind of God.*'[15]

Robert Jastrow, founder and director of NASA's Goddard Institute for Space Studies, puts it this way:

'We can never tell whether the hand of God was at work in the moment of creation; for a careful study of the stars has proven, as well as anything that can be proven in science, that all matter in the Universe was compressed into an infinitely dense and hot mass when the world began; and in the searing heat of that holocaust, the evidence needed for scientific study of the cause of creation was destroyed. If this conclusion is valid, the astronomer must say to his colleagues who still pursue their inquiries into the past: 'You may go thus far, and no farther; you cannot penetrate the mystery of creation'.'[16]

Later, in another book Jastrow writes:

'For the scientist who has lived by his faith in the power of reason, the story ends like a bad dream. He has scaled the mountains of ignorance; he is about to conquer the highest peak; as he pulls himself over the final rock, he is greeted by a band of theologians who have been sitting there for centuries.'[17]

Asking God to 'please explain' is something we all try to do from time to time. Almost daily we hear the common questions, particularly following a disaster, natural or man-made, of some kind. 'Why

[15] S Hawking, *A Brief History of Time* (1988),Toronto, Bantam Books, 1995 reprint p185 *cf* P Davies, *The Mind of God: Science and the Search for Ultimate Meaning,* London, Penguin, 1992

[16] R Jastrow, *Until the Sun Dies,* New York, Souvenir Press, 1977 p20

[17] R Jastrow, *God and the Astronomers,* New York, W W Norton & Co, 1978 p116 *cf* O Gingerich, *God's Universe,* Cambridge USA, Harvard University Press, 2006

does God let it happen?''Why is there suffering in the world?'[18] Why do bad things happen to good people?

Another approach which is not always voiced is 'Why doesn't mankind/science prevent it?' Surely we have the technology to prevent earthquake damage, even if not earthquakes themselves. With global warming in the offing, we have the resources — even if not the willpower — to move people to dwellings on higher ground, also out of reach of tsunamis and major flooding. If we had spent more time looking through the eyepiece of a microscope instead of a gun-sight, what might mankind have achieved with the resources we have squandered so carelessly?

I would like to share with you some personal doubts and possible solutions to questions that I have found over the years. They are not all helpful, but may suggest that some answers could be far from conventional, as your lateral thinking is encouraged.

For some people, the Bible provides all the answers. There are some passages that resonate.

'In the beginning was the Word, and the Word was with God, and the Word was God.' (John1:1)

When you first heard this, particularly if it was read by a good reader with a resonant voice, perhaps in a hushed church, you might have been impressed by its force/power/majesty. However if you looked at the words as written, almost immediately you have to ask what it all means. This is one model of theology — people asking questions about the meaning of words in books, then trying to explain this to other people. It's a start![19]

Science, to most people, is much more meaningful. Or is it? Consider this chapter beginning from a slightly dated introduction to ideas of quantum and wave mechanics: *'One must be prepared to approach the subject of this chapter* [wave mechanics] *philosophically, pre-*

[18] *cf* P Yancey, *Where is God When it Hurts?* Grand Rapids MI, Zondervan, 1990; & C S Lewis, *The Problem of Pain,* London, Fount, 1998

[19] A helpful place to start is L Morris, *The Gospel According to John,* Grand Rapids MI, Eerdmans, 1995 Ed (revised) pp63–70 & p102

pared to accept conclusions which are, at first thought, seemingly at variance with our senses and with a belief that has persisted almost unquestioned from the time of the Greeks, viz, that matter is made up of particles.'

The author presumably expects us to lack the intellectual robustness of the White Queen in Chapter 5 of *Through the Looking Glass and What Alice Found There*:

> *'Alice laughed. 'There's no use trying,' she said, 'one can't believe impossible things.'*
>
> *'I daresay you haven't had much practice,' said the Queen. 'When I was your age, I always did it for half-an-hour a day. Why, sometimes I've believed as many as six impossible things before breakfast'.'*[20]

Does science also require us to suspend rational belief in verifiable concepts? The philosopher Del Ratzsch writes:

> *'Are there areas within which pure science cannot directly speak? There are many. To begin with, science cannot validate either scientific method itself or the presuppositions of that method. Consider for instance the principle of the uniformity of nature… this principle does not appear to be a result of science for the simple reason that it is a presupposition employed in generating results.'*[21]

Part of the problem is our reliance on models in science. They are meant as an aid to understanding. We have a mathematical model of what a 'particle' is, what a 'wave' is, but logically there is no reason why any part of the real world should behave like either of these.[22]

This particular example is for most people little harder than accepting — as students must these days at an early age — that most of what we call solid matter is in fact empty space. Amongst other

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[20] L Carroll, *Through the Looking Glass & What Alice Found There* (1871) in *The Complete Illustrated Works of Lewis Carroll,* London, Chancellor Press, 1995 p173

[21] D Ratzsch, *Science & Its Limits: The Natural Sciences in Christian Perspective,* Downers Grove IL, IVP, 2000 p92f

[22] A useful discussion of models in science and religion is I G Barbour, *Myths, Models and Paradigms: A Comparative Study in Science and Religion,* San Francisco, Harper & Row, 1974

ideas this leads to the apparent paradox that two things can never actually 'touch'.

This could be a useful reminder when we consider the nature of God — does She have to be visible, touchable, even detectable? Antony Flew raises this question using John Wisdom's *Parable of the Invisible Gardener*:

> *'Let us begin with a parable. It is a parable developed from a tale told by John Wisdom in his haunting and revolutionary article 'Gods.' Once upon a time two explorers came upon a clearing in the jungle. In the clearing were growing many flowers and many weeds. One explorer says, 'Some gardener must tend this plot.' The other disagrees, 'There is no gardener.' So they pitch their tents and set a watch. No gardener is ever seen. 'But perhaps he is an invisible gardener.' So they set up a barbed-wire fence. They electrify it. They patrol with bloodhounds. (For they remember how H G Well's* The Invisible Man *could be both smelt and touched though he could not be seen.)*
>
> *But no shrieks ever suggest that some intruder has received a shock. No movements of the wire ever betray an invisible climber. The bloodhounds never give cry. Yet still the Believer is not convinced. 'But there is a gardener, invisible, intangible, insensible, to electric shocks, a gardener who has no scent and makes no sound, a gardener who comes secretly to look after the garden which he loves.' At last the Sceptic despairs, 'But what remains of your original assertion? Just how does what you call an invisible, intangible, eternally elusive gardener differ from an imaginary gardener or even from no gardener at all?'.'*[23]

This book is about a journey, by two quite separate people, who only realized quite recently that they had sought the same destination from two quite distinct starting points. One was a theologian, wondering how God could be associated with the real world as investigated by science; the other, a scientist, wondering how the de-

[23] A Flew, 'Theology and Falsification' in A Flew & A MacIntyre (Eds), *New Essays in Philosophical Philosophy,* London, SCM , 1966 p96

vice called Occam's razor could allow the assumption of a supreme being. Both think of themselves as teachers, who, in both the good old days and the current paradigm, are required to present ideas in a comprehensible way, not to enforce conclusions, but to present alternatives in an unbiased way.

We are sharing this book because we believe that many people feel a need to understand as much as they can about their world — a world which presents them at best with vast amounts of information which must be digested, at worst more or less accurate misinformation designed to produce conformity to somebody else's ideas. Given that many people will have had the advantage of a modern education, but may never confront RE or science again, we would like to think that some could use this resource to think about those deep issues that arose from looking at the stars.

We hope our views will overlap in some areas, particularly as we both see the need for an openness to ideas that relate to the meaning of our very existence and purpose. It seems that many people fill their lives with activity, but the reason for the activity is beyond bare necessity, at least in our little corner of the world. As we face both a green revolution and global warming we need to ask why we may want the world to be a better place — whatever that may mean.

Oh… by the way, the references to science fiction. Since my teen years I have been reading science fiction, alongside (and let's be honest, sometimes instead of) science non-fiction. Much of it is challenging as well as fascinating, often picking up ideas from real science and pushing them to extremes. Some authors are better than others at keeping their science accurate, so I've had practice in examining ideas that are possible but outside the square. Many stories involve ethical and sociological dilemmas. A surprising number involve God in both positive and negative aspects, so I shall be referring to science fiction in what I write. If my thought patterns go too much off beam, blame my background in sci-fi rather than in physics.

Finally, in sharing this book with Richard I hope we can provide some resources as starting points for those who wish to discuss the

deeper issues, as well as confidence that they have the right — perhaps even the duty — to express themselves. If they can avoid being overwhelmed by the brash overconfidence of some who hold extreme views at either end of the spectrum, I shall be pleased. One of my favourite ideas for my students, applied specifically to Physics, but more generally applicable, is that if two theories exist which represent the extreme possibilities, the truth usually lies somewhere in between.