

SCIENCE

and the

KNOWLEDGE

of

GOD

*A Look at the Biblical Doctrines of the Identity and
Nature of God Through the Eyes of a Scientist*



JOHN D. GIBBON



Science and the Knowledge of God: A Look at the Biblical Doctrines of the
Identity and Nature of God Through the Eyes of a Scientist

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Psalm 115:1-8

Not to us, O LORD, not to us, but to your name give glory,
For the sake of your steadfast love and your faithfulness!
Why should the nations say, “Where is their God?”
Our God is in the heavens; He does all that he pleases.
Their idols are silver and gold, the work of human hands.
They have mouths, but do not speak; eyes, but do not see.
They have ears, but do not hear; noses, but do not smell.
They have hands, but do not feel; feet, but do not walk;
And they do not make a sound in their throat.
Those who make them become like them;
So do all who trust in them.

The ESV has been used for all biblical references unless otherwise stated.
References, in square brackets [], lie at the end of each chapter.

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Preface

Over the last generation, the number of followers of what is now called ‘popular science’ has bloomed like the biblical mustard tree. A variety of birds have come to shelter in its branches. Those whose motives are educational, in that they wish to bring to public attention a wide range of current scientific ideas, are generally much to be welcomed. However, a sister-species has also begun to roost side by side with the former. This is comprised of a small but influential number of prominent scientists who have strayed into a form of speculative quasi- or anti-religious propaganda on the existence or non-existence of God and the status of humanity in the wider universe. Many of these often entertaining ideas, one strand of which I would call ‘religiously-tinged physics’, touch the heart of the Christian message, for they challenge the identity and nature of the God we worship as revealed in the Bible. Unfortunately the noise from the inhabitants of the tree has also attracted other species who regrettably see all science as a conspiracy to deny biblical truths. The tree is in danger of turning into a war-zone. As we have been constantly reminded, the first casualty in war is truth. It is becoming increasingly difficult for the interested observer to distinguish between scientific fact and fiction and between a rigorous result and mere opinion.

It is certainly true that an avalanche of new results and ideas have swirled around the scientific world in the 21st century: artificial intelligence, theories of the mind, genetic engineering and editing, astrobiology and complex computer networks, as well as new areas of cosmology and astrophysics. All of these have been much hyped by the science writers of the day and have tickled the popular imagination. Indeed, all the indications are that this rising tide has yet to reach its zenith. Moreover, I have come to believe that evangelicals are at risk of becoming beached by an over-concentration on endless debates on evolution and creation issues—like an evangelical version of Groundhog Day—while ignoring

the chatter on newer issues which have already left their mark on the public mind. If ignored or misapplied, these have the potential to distort our conception of God and pull the biblical doctrines on His identity and nature out of shape. This is the concern of this book: how do we faithfully keep and teach the biblical doctrines on the character of God while we are deluged with a barrage of noisy outside chatter on popular scientific issues that often appear to contradict them?

Despite its brevity, this book has been many years in the writing, and is aimed at the Christian reader who has an interest in popular science issues but wishes to consider them in a biblical context. The specialist will rightly consider much of the material to be superficial but my aim has been to reach as broad an audience as possible. Historically, our understanding of science has progressed through the asking of questions, so it is in this style that the book has been written. Inevitably it has involved some comments on the literature of the day. The opinions expressed on these are entirely my own.

In particular I would like to thank Sheila, my wife, who has had to endure the years while this book has come to fruition. I would specifically like to thank Mark Chambers, Patrick Hunt and Ann Beatt (née Lloyd-Jones) without whose encouragement and clear-minded comments this work would not have appeared. Thanks are also due to Liam Goligher, Anne Hinsley, Paul Lickiss, Richard Linnell, John Samuel, Peter Smith and Peter Török who read and commented upon various versions of the manuscript. Last but not least I would like to thank Timothy Demy and Wayne House of Lampion Press for their patience and sound judgement in helping me nurse this book through its final stages.

1

Science and the Bible: Truth, Fiction and Fantasy



1.1 Introduction

It is now at least three generations since the modern art movements¹ appeared on the international scene and began to change western people's perceptions of their own inner and outer worlds. Around the turn of the 20th century these movements turned increasingly to abstraction and surrealism to express this changing, often neo-gnostic, view of the world [1]. The parallel retreat of biblical Christianity in the last quarter of the 19th century under the attacks from the German liberal theological schools (coinciding with the rise of the movements in modern art, philosophy and music) allowed the proponents of the modern movements to appoint themselves as high-priest interpreters of the meaning of the universe. More than a century later the shift in thought and attitude is almost complete.

A similar shift appears to happening now but in a different domain. The popularization of science is currently immensely fashionable—astronomy, the Big Bang, the Higgs boson, black holes, or the

¹ The exhibition in 1863 of Edouard Manet's painting, *Déjeuner sur l'herbe*, in the Salon des Refusés (organized by the painters who were rejected by the Academie des Beaux-Arts), is commonly identified as the beginning of modern art. The name 'Impressionism' came 11 years later when a group of 30 artists participated in their first exhibition, held in April 1874, at a photographer's studio. A critic gave it the derisive name 'The Exhibition of the Impressionists' and its use thereafter has remained.

complications of the genetic code illustrated by dazzling multi-coloured graphics—are relentlessly explained in a breathless, highly dramatized style in a variety of TV programmes. In turn, these are complemented by a plethora of personal blogs, web-site articles [2], and science magazines such as *Scientific American* [3, 4] or *New Scientist* [5]. The CBS sitcom *The Big Bang Theory* has captured the flavour of much of this. Not far behind in the fashion-stakes are speculations on the consequences for human development of artificial intelligence (AI) and large-scale computer networks. Yet a definite distinction can be made between what could be called *popular* science and *populist* science. Popular science could be categorized as genuine attempts to explain interesting current ideas, such as astronomy and space science, to the public through the TV, schools' programs, reputable science magazines and general lectures. For example, London's Science Museum, the Royal Institution and other bodies put on some marvellous programmes. In contrast, the phenomenon I would call populist science often turns into a form of quasi-religious (or anti-religious) propaganda put out by a small set of celebrity scientists who, while extremely distinguished in their own fields, use their professional position to propagate their own opinions on the existence or non-existence of God, the future of the human race or the validity of religion.

Numerous examples of this influence lie in cosmology, complexity and evolutionary biology. On occasion some well-known name cannot resist the impulse to appoint himself or herself a high-priest-scientist—a familiar stereo-type—by moonlighting as a philosopher or secular prophet. The resulting book is usually couched in popular scientific language but propagates ideas that lie well beyond the rigorously established results of the author's technical expertise and, more often than not, contains quasi-religious personal opinions. The book reviewer Brian Blank once acidly referred to this style of writing, common-place in cosmology, as “science fiction with academic cachet” [6]. One classic example from the past generation is that of the Nobel Laureate biologist Jacques Monod (1910-1976) who wrote sonorously in 1971: “Man at last knows he is alone in the unfeeling immensity of the universe, out of which he has emerged only by chance” [7, 8]. Grand, but hopelessly vague, philosophical statements of a quasi-religious nature have

generally been the exclusive domain of French philosophers, but the recent plethora of coffee-table articles on the Big Bang, black holes, the Higgs boson, time travel and the existence of parallel universes (multi-verses²) has reached the level of the chattering classes to such a degree that it is now considered cool to discuss the cosmological origins of the universe over dessert³. It is now common to listen to lectures either live or on the web where the lecturing physicist talks a big game about the origin and destiny of humankind, sprinkles it with some allusions to Einstein, and then follows it by making some remarks on the Heisenberg Uncertainty Principle or quantum entanglement—much of this is expressed in the techno-babble so often heard in TED conferences⁴. He or she then stirs in some tasty quotes from Wittgenstein or Nietzsche: there you have the recipe for a modern popular lecture, undoubtedly entertaining, but wholly devoid of any meaningful content or serious proof. The conclusion is that while the popularization of science is to be welcomed, the ideas coming from its populist equivalent can, on occasion, have strongly negative implications for the Christian message, for many of them impact the biblical doctrines concerning the identity and nature of God. It is these issues that are the concern of this book.

Almost a quarter of a century ago the militant, atheist, science-fiction author Isaac Asimov was profoundly right when he was reported to have said “The saddest aspect of life right now is that science gathers knowledge faster than society gathers wisdom” [12]. It ought to be

2 The Royal Court Theatre has even staged a production in London’s West-End Theatre district of a play called *Constellations* which explores theories concerning parallel universes.

3 A further example lies in the Guardian newspaper interview (16th May 2011) with Professor Stephen Hawking, who wrote the immensely popular *A Brief History of Time* in which he popularized the idea of the ‘mind of God’ [9]. Hawking suggested that a belief that heaven or the after-life awaits us was a ‘fairy story’ for people afraid of death [10]. Two days later on the 18th May 2011, *The Guardian* published a carefully phrased and balanced response from Michael Wenham, a teacher, writer and Anglican vicar who, like Hawking, suffers from Motor Neurone Disease. Wenham suggested that since science is based on evidence he also found the evidence for the Resurrection extremely cogent [11].

4 The acronym TED means Technology, Entertainment and Design and refers to a global set of conferences run by the private Sapling Foundation. The main annual TED conference is now held in Vancouver, with live streaming, where speakers address a wide range of scientific and cultural topics.

questioned whether it is wise to use newly-discovered scientific results⁵ to make speculative and unjustified leaps of interpretation in the philosophical and religious spheres. In particular, the proponents of what could be called ‘religiously-tinged physics’ occasionally use Christian words and phrases whose meanings are changed or found to be empty when examined more closely.

We live in interesting times: physical, computational and bio-medical scientists and engineers have pushed their frontiers beyond unprecedented horizons. It is very difficult for interested non-experts to distinguish between what is rigorous science and what is pseudo-science which propagates false or unprovable speculative ideas. Rigorous science comes from the development of careful experimental and/or theoretical results that are checkable and repeatable⁶ by other parties, which are then accepted as valid results through peer group review. Pseudo-science is the assertion of vague, exaggerated or un-testable claims which lack specific measurements and which do not stand up to peer-group review. Unfortunately, the result has been a blurring in the mind of the public between what has been rigorously demonstrated and what is mere speculation.

For instance, the fear of an earthquake in the city of Rome in May 2011 caused a heavy population exodus. It was stoked by a group of followers of the pseudo-scientist Raffaele Bendandi (1893-1979), who died more than 30 years ago. Bendandi was a self-proclaimed scientist⁷ who, having claimed to have used a combination of seismology and cosmology, had calculated that a ‘big one’ would hit Rome specifically on the 11th day of May 2011 (which it didn’t). In reality no earthquake

5 Richard Rhodes book on the making of the atomic bomb makes interesting reading [13]. The subsequent travails of the world-wide nuclear industry have thrown up a much debated set of ethical dilemmas since the exciting academic birth of nuclear physics almost a century ago.

6 Some experiments are difficult to repeat: for instance, the instruments on the great space observatories or the LHC at CERN are once in a generation enterprises.

7 It also ought to be pointed out here that Harold Camping, a church pastor in Oakland California, claimed that Jesus would return to earth on May 21st 2011 and that an earthquake would begin then at various time zones around the world and would mark the start of the world’s destruction, and that by 21st October 2011 all non-believers would be dead. Yet Jesus said that not even He, only the Father, knew the time of His return. One should ask oneself how a Californian pastor could ‘know’ what Jesus Himself did not know?

research group in the present day would dare to make a reliable prediction for next month, never mind for more than 30 years in the future, because each quake displays unique characteristics. Some are preceded by pre-shocks or tremors, while others occur without warning⁸.

The headlong retreat in the last two or three generations in western culture from a biblically-based perspective has dramatically changed the public canvas on which ideas are expressed [15, 16]. It has often been said that nature abhors a vacuum. As biblical influence on western societies has disappeared, a strange melange of not only religiously-tinged physics but a much cruder form of populist sci-fi beliefs about aliens, multi-faith religions, eastern mysticism and astrology has been sucked into the public domain. The result is a blurring of any perspective on the ultimate questions regarding the origin and destination of humankind. The public canvas has thus become open to the painting of any shape or form that appears to be the fashion of the moment. When mixed together with extreme versions of materialistic individualism, a Jackson Pollock-like painting has emerged which represents what popular western culture thinks of as ‘theology’ which is unrecognizable to the Christian.

How are Christians to deal with this? The old Puritan adage about “preaching to the condition of your hearers” ought to be taken seriously. If your hearers are steeped in a culture driven by secular values that may, in part, be hostile to the Gospel, how will you be able to talk to them and answer their questions unless you understand how their minds have been formed? Most western Christians fall into one of two camps. Military intelligence psychologists have invented a term called ‘mirror imaging’ in which the players on one side of a game or relationship assume that their opponents think like they do and will thus take the same decisions that they themselves would take. The opposite is to passively allow one’s opponent to dictate one’s own thought and behaviour. In the latter case, Christians can be so steeped in their local

8 Writing about the court judgment against six scientists over the April 2009 LAquila earthquake, the *Financial Times* science correspondent Anjana Ahuja [14], said “This judgment highlights the statistically tricky no-man’s-land that separates complex, nuanced expert evidence from the blunt policy announcements they inform. In areas ranging from public health to civil protection, counter-terrorism to financial regulation, there cannot be many risk analysts who cheered the news.”

culture that they unconsciously mimic it to such a degree that they are unable to take a biblical perspective on the world around them. The lazy reaction is to let the formative ideas in our society flow thoughtlessly past us or around us, thereby putting ourselves and the church at risk of becoming marooned by the ebbing tide. Carl Trueman has observed [17]:

As the goldfish swimming in the bowl is unaware of the temperature and taste of the water in which he swims, so often the most powerfully formative forces of our societies and cultures are those with which we are so familiar as to be functionally unaware of how they shape our thinking, even our thinking about what exactly it means to say that Scripture has supreme and unique authority.

Many Christians fall into one trap or another and are then puzzled by their own entangled thinking when serious issues arise. Whatever the situation in which we find ourselves, a serious Christian ought to use the minds they have been given to understand the issues and grapple with them in a way that is both intellectually rigorous and also faithful to the Bible.

1.2 Intrusive Scientific and Natural Questions

Ever since men and women have walked the earth their observation of the natural world has provoked the questions “Who am I? Who, what, where is God?” In his characteristically flowery style, Augustine of Hippo⁹ said [18]:

But what is my God? I put the question to the earth. It answered “I am not God”, and all things on earth declared the same. I asked the sea and the chasms of the deep and the living things that creep in them, but they answered, “We are not your God. Seek what is above us.” ... I asked the sky, the sun, the moon, and the stars; but they told me “Neither are

⁹ Augustine of Hippo A.D. 354-430; born in Tagaste in Roman North Africa.

we the God whom you seek.” I spoke to all things that are about me, all that can be admitted by the door of the senses, and I said, “Since you are not God, tell me about Him. Tell me something of my God.” Clear and loud they answered “God is He who made us.” I asked these questions simply by gazing at these things, and their beauty was all the answer they gave.

The Bible makes no attempt to prove the existence of God: it simply states propositionally in Genesis 1:1 that He exists. Then, in subsequent books, it goes on to unfold His character and actions in history. Moreover, general revelation alone tells us a little about the nature of the God of the Bible in terms of His attributes, but speaks only of His existence¹⁰. As the Apostle Paul has reminded us, it serves as a provocation, or a prod in the ribs, when we observe the natural world, pointing us to the existence of an infinite, immanent, omniscient being who has a moral character [20, 21]. In Psalm 19, King David said:

The heavens declare the glory of God, and the sky above proclaims His handiwork. Day to day pours out speech, and night to night reveals knowledge. There is no speech, nor are there words, whose voice is not heard. Their voice goes out through all the earth, and their words to the end of the world. (Psalm 19:1-4)

This caused Immanuel Kant (1724-1804) to respond [22]:

Two things fill the mind with ever and increasing admiration and awe, the more often and steadily we reflect upon them: the starry heavens above me and the moral law within me.

A further example comes from Psalm 8:3-4: “When I look at Your heavens, the work of Your fingers, the moon and the stars, which You have set in place, what is man that You are mindful of him, and the son of man that You care for him?” Science (from the Latin *scientia* for

10 For a definition see [19].

'knowledge') leads us toward God, not away, as Psalm 19 makes clear. Francis Bacon suggested that philosophy and human learning perform a service to 'Faith and Religion' as effective inducements to the exaltation of the glory of God [23]:

... laying before us two books or volumes to study, if we will be secured from error; first, the Scriptures, revealing the Will of God; and then the creatures expressing His Power; whereof the latter is a key unto the former: not only opening our understanding to conceive the true sense of the Scriptures, by the general notions of reason and rules of speech; but chiefly opening our belief, in drawing us into a due meditation of the omnipotency of God, which is chiefly signed and engraven upon His works.

The common questions posed about the evidence for the existence of God are not strictly answerable at the level of human experimentation; that is, they cannot be answered by looking for His footprints in the laws of physics or deduced from a set of rational axioms (see more on this in chapter 2). Moreover, He should not be considered, as some modern theological schools do, as an existential mystery impossible to put into words. Instead, God has revealed Himself and His character in written, documentary form in the Bible and ultimately in the sun-blaze of His Son, Jesus Christ¹¹. Another mistake is to treat the biblical landscape as little more than a handy resource for arguments over dates and times¹², rather than the revealed Word of God that expresses His character. This will likely result in a wrong conception of God, and a fundamentally flawed view of the physical world and of humankind.

Nevertheless, it is true that there is an unconscious reflexive response in humankind to general revelation that causes us to want probe the natural world to look for answers to the intrusive questions of the origin and meaning of life. It is therefore no accident that the US National Aeronautics and Space Administration (NASA) and the

11 Why orthodox (with a small 'o') Christians hold to the authority of the Bible, see the first chapter entitled 'The Doctrine of the Word of God' in Wayne Grudem's book [24].

12 I would qualify this remark by saying that in Christian apologetics, a careful examination of the evidence, which includes dates, times and events, is necessary in defence of the Bible [25, 26].

European Space Agency (ESA) have multi-billion dollar annual budgets to fund experiments designed to gather information about the cosmos. The China National Space Administration (CNSA) has concentrated initially on manned flight but has ambitions for a new program of lunar exploration. In a different area the US National Institute of Health (NIH) has managed a multi-billion dollar project to map the human genome. Not only do NASA, ESA and CERN¹³ make sure the general public are kept aware of their results and intentions by frequent media briefings but it is also true that these results and the experiments at CERN are popularized by the media in a distinctively romantic style similar to the way earlier generations treated the Victorian or polar explorers. Additionally, the search for extra-terrestrial intelligence (SETI [27]) receives, at times, a media exposure that is almost frantically exaggerated in its coverage: see chapter 6. Some examples that receive regular media reportage are:

- The four space observatories Hubble, Compton, Chandra and Spitzer are space telescopes that make up NASA's Great Observatories program¹⁴. In addition to these are the Planck¹⁵ telescope (ESA) and the Kepler¹⁶ (NASA) space observatory that orbits the Sun. Planck's main goal was to map the oldest light deriving from the early formation of

13 The acronym CERN comes from the original name of the Laboratory 'Conseil Européen pour la Recherche Nucléaire' (European Council for Nuclear Research). It was founded in 1954 and now has 20 countries as members.

14 The Hubble telescope is a collaboration between NASA and ESA and is the first of NASA's Great Observatories. The Compton (Gamma-ray) and Chandra (X-ray) Observatories are the second and third of NASA's Great Observatories: Compton is now de-activated. Spitzer is an infra-red observatory. Chandra is named after the Nobel Laureate physicist Subrahmanyan Chandrasekhar (1910-1995). Compton is named after Arthur Compton (1892-1962), an American physicist who won the Nobel Prize in Physics in 1927 for his discovery of the Compton Effect, which demonstrated the particle nature of electromagnetic radiation. Spitzer is named after Lyman Spitzer (1914-1997) who was an American astronomer who carried out research into star formation and plasma physics. In 1946, he conceived of the idea of telescopes operating in outer space.

15 Planck was named after the German physicist Max Planck (1858-1947) who won the Nobel Prize in 1918 for his pioneering work in quantum mechanics (1900) which changed the nature of the physical sciences.

16 Kepler is named after Johannes Kepler (1571-1630) who was a German mathematician and astronomer who is best known for his laws of planetary motion.

the universe: it was de-activated in October 2014. Kepler's main mission is to survey a portion of our region of the Milky Way galaxy to discover Earth-size planets in or near what is called the 'habitable zone' and to determine how many of the billions of stars in our galaxy have such planets. Compton is no longer operative.

- The Cassini-Huygens orbiter¹⁷, which has visited Jupiter, Venus, Saturn and its moon Titan and the Very Large Telescope¹⁸ (VLT) array in Chile are further examples of this endeavour. There is also the more recent Messenger probe sent into orbit by NASA around the planet Mercury following the visit by the Mariner 10 spacecraft of the 1970's.
- Other aims of these big experiments, among others, are the measurement of the cosmic background radiation (CBR) that remains from the creation of the early universe; conducting experiments to verify Einstein's theory of gravitation; or gathering data in an attempt to understand planetary atmospheres and surfaces.
- A further high-profile enterprise is the Large Hadron Collider (LHC) at CERN in Switzerland which regularly features in the international news¹⁹. This is centred in a 27km oval-shaped underground tunnel in which beams of protons are accelerated in opposite directions at close to the speed of light. The ultimate aim of the experiment is to collide particles head-on at 14TeV (Tera [1000 billion] electron volts) with the intention of recreating the conditions in the few moments after the beginning of the universe. In early July 2012 CERN announced their finding of the Higgs

17 Cassini-Huygens is a space vehicle built in collaboration between NASA, ESA and the Italian Space Agency (ASI). Christiaan Huygens (1629-1695) was a prominent Dutch mathematician and scientist. Giovanni Cassini (1625-1712) was a prominent Italian astronomer.

18 The VLT array is a combination of four optical telescopes run by the European Southern Observatory which is an inter-governmental collaboration of 14 European countries.

19 CERN is funded by a consortium of European countries. Its main task has been to collect data in its search for various fundamental particles such as the Higgs boson. In early July 2012, it came to a positive initial conclusion: see 2.7 Appendix C of chapter 2.

boson and on 8th October 2013 Peter Higgs and Francois Englert received the Nobel Prize for Physics. However, there is still much to be done to understand the properties of this long-predicted particle [28].

- The Human Genome Project was begun in 1986 and completed in about 2003. Its primary goal was to determine the sequences of base pairs of nucleotides which make up DNA, and to identify and map the approximately 20,000—25,000 genes of the human genome. It was pursued jointly by the US National Institutes of Health (NIH), the National Human Genome Research Institute and by the private Celera Corporation. The Genome Project is a classic example of one whose aim, unlike the great space telescopes, is to look inward and not outward.

1.3 The Globalization of Science, Anti-Science and the New Atheists

Ernst Gombrich began his fascinating book *The Story of Art* [29] with the controversial statement “There really is no such thing as art. There are only artists.” His point was that men and women have been painting on the walls of caves and on pottery long before ‘Art’ appeared in the culturally interpreted sense that we think of today. Let us broaden the question to ask whether there is no such thing as science but only scientists? The answer to this is not clear-cut. Every man or woman is able to observe phenomena in the natural world—the stars; surface waves upon water; the pinch on the developing water droplet from a tap—and use common sense principles to draw conclusions. Science, however, now has a multi-state-sponsored, industrial and political dimension which has culminated in the collaborative experiments such as the space telescopes or the LHC at CERN. Some scientists have become but small cogs in the engine of a ‘Big Science’ experiment. These collective, state-sponsored experiments, which are now too expensive even for a single government, have now become the large-scale organized ‘Science’ that Gombrich has claimed that ‘Art’ is not. It is clear that while these ‘Big Science’ experiments have an enormously high

public profile, this can have a distorting effect²⁰. Despite the wide range of admirable engineering, instrumentation physics, and data analysis methods employed, these ventures still touch only a small fraction of what physical, engineering and bio-medical scientists actually do in reality. The annual publication output of this greater cohort across the planet runs into tens of millions of technical scientific papers, but only a relatively small proportion are concerned with high profile issues. It is therefore unfortunate that many questions about the nature of our universe asked by working scientists have fallen under the radar because popular writers concentrate on either high-profile or controversial matters. Thus many Christians have been persuaded, incorrectly, that a few subjects, such as astronomy, high energy particle physics or evolutionary biology²¹, are the *only* subjects that scientists study. In the introduction to her book on a history of science writing, Susan Wise Bauer wrote [32]:

... the nature of science itself seems to get lost in the details. Most ‘people’, regular citizens who have no professional training in the sciences, still have no clear view of what science does—or what it means.

This is all the more unfortunate because globalization is profoundly altering the research agenda in the world. In a recent article in the magazine *Scientific American* [30], John Sexton, the current President of New York University (NYU), has argued that a global society has now begun to operate as a network of creativity and innovation, with a set of ‘idea capitals’ forming the principal nodes. He has argued that while the ‘talent-class’ once moved between Venice, Milan, Florence and Rome during the Renaissance, now the most creative citizens move between Silicon Valley, Shanghai, London and New York City. Moreover, the internet also provides a global connectedness that was previously unknown. While some of this might be considered to be a

20 The public understanding of science itself now takes a high priority: major research council grants in the UK must all have an element of ‘outreach’ written into them.

21 I am not saying that Christian interest in evolutionary biology is not important: rather, it is by no means the *only* endeavour that is important.

little over-blown, his most compelling point is that the globalization of science has thrown up topics that had not existed before, such as food security, water issues and tropical illnesses provoked by climate change. Collaborative ‘Big Science’ projects on an international scale such as the LHC and the Human Genome Project are now taken for granted. Likewise the medical treatments for polio and malaria, following the eradication of smallpox, are now being tackled on a continental scale.

In parallel with this, an anti-science counter-culture view has also begun to develop in recent years, mainly in the United States, which holds that science is, at best, a suspicious activity and, at worst, a conspiracy to delude the world. This is a grotesque distortion of reality. The factors that have contributed to the growth of this position are manifold with no dominant simple cause but it has to be admitted that certain Christian groups in the US are sympathetic to this stance. Part of the confusion has been caused by the controversies in the climate change debate in which many of the scientific issues are complicated to an extreme degree [31]. It is erroneous to treat scientific results as “your propaganda versus my propaganda”, as if they are simply matters of opinion. Testing the available evidence lies at the heart of all endeavours that seek to establish a truthful view of the world (see chapter 2).

A further addition to this already over-rich mix are what have been called the New Atheists²² who push a militant, atheistic, world-view [34, 35]. They attack their targets with all the fervour of propagandists at war in the glare of the media where the more they shout, the more they think they will be heard. This highly influential minority seem to wish to force their own image or likeness onto the world, and have equally distorted the general public’s perception of the average scientist’s methods and worldview—see critiques of these attitudes by John Lennox [36, 37, 38], Howard Jacobson [39] and Alister McGrath [40].

1.4 Science Fiction Becoming Science Fantasy

22 What have been called the ‘Four Horsemen of New Atheism’ are Daniel Dennett, Richard Dawkins, Sam Harris, and the late Christopher Hitchens [33].