An Unnecessary War: The Tragedy and Wasted Effort of the Conflict between Science and Religion

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Abstract: The supposed conflict between science and religion is widely assumed to be longstanding and inevitable, but in fact is very recent, logically invalid, and unnecessary. Science and religion belong to different domains of human experience, so each can decide only between alternative explanations offered *within* their own domain, not *across* domains. The conflict image can descend into warfare when both sides ignore the dangers of misinterpreting the logical rules of inference and of selective perception of data. The most strident voices rarely admit their mutual lack of training in the sophisticated philosophy of metaphysical reasoning and the serious literature underlying their opponents' position. Both sides base their arguments on necessarily incomplete models of invisible realities, treated as if they are as tangible as real life, so both fall into the "fallacy of misplaced concreteness." Atheists promote materialism as a simpler alternative to religion, ignoring warnings from quantum physicists that the structure of the world is increasingly mysterious, and far from simple. Science does not entail materialism. The conflict image could be defused with dignity if the opposing sides agreed to take each other seriously, consider the hierarchical structure of reality seen and unseen, and work together for the benefit of the communities of both science and religion.

Keywords: history of religion; metaphysics; models of invisible reality; philosophy of science

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Modern students are often required to choose which, from among the different messages they receive from their parents and teachers, they can accept as true. In fact, the world is full of contradictory messages, confusing to adults as well. Ultimately, we all have to decide what sources of information to trust. We all have to answer the two critical questions that life throws at us: who can tell us most truthfully about how things are and which things matter? Cultural authorities once answered both questions in metaphysical terms, couched as memorable mythical stories. Now that science has taken over explaining how things are in literal terms, these and many other ancient ideas are rejected because they no longer fit reality. Rarely does any child get any help, early enough or at all, to understand the important difference between literal and mythical truth.

Metaphorical versus Literal Truth

Every human society has formulated its own set of mythical accounts of deities that determined human origins and the social consequences of divine demands for the living members of society. For example, the Hebrew scriptures claim that God formed Adam out of the dust of the earth, and that Eve was made by God out of Adam's rib. Therefore, they conclude that because the woman was made after the man, to be his helper and partner (Genesis 2:21), she should always be subject to his authority. They add that, although the human body was formed from the earth, it became alive only by the breath of God. These ancient Hebrew understandings of how things are and which things matter were the undisputed bases of Western facts and values until Copernicus (1473–1543). Since the Enlightenment, Western civilisation has discarded them, leading to a cultural crisis described by philosopher Loyal Rue as *Amythia*.[1]

Many young children, brought up in Christian households, absorb traditional stories such as those involving a talking snake in the

1 L. D. Rue, *Amythia: Crisis in the Natural History of Western Culture* (Tuscaloosa, AL: University of Alabama Press, 1989).

Garden of Eden as if they were literally true. Adults tend to regard with amusement a toddler's belief in animals queuing up to enter Noah's Ark, alongside their children's acceptance of more recent characters such as Father Christmas and the Tooth Fairy. Hence the critical groundwork of our children's earliest understanding of how things are in nature is laid on a series of recognised, tolerated falsehoods told to them in all seriousness by the people they trust. When stated so baldly, this state of affairs should be deeply shocking, and would be so, were it not so familiar and culturally accepted. When those same children get older, they meet the teaching of science in schools and universities, presented as the only true foundation of understanding the natural world. Answers to obvious questions, such as "How could the dinosaurs have fitted on to the ark?" will depend on who they ask. Parents invested in literalist interpretations of biblical stories might suggest "As eggs, of course," ignoring further questions concerning how the lions could have survived for weeks on the ark without eating the antelopes or the cattle without access to green vegetation.

Good teachers concerned to lead children towards a nonliteral understanding are more likely to describe Noah as an archetypical character, and the story of the ark as a myth. Religious myths are not falsehoods. They are stories not meant to be taken at face value, but are important because there is truth in them. C. S. Lewis referred to them as "true myths." In turn, false myths promote lies, such as those embedded in powerful Superman figures, which encourage belief in the right of the strong to impose their worldview on others by force. Interested parties confuse true myths and false myths for the purposes of dismissing the significance of the former. They claim that only the sciences have authority in establishing facts. As familiar biblical stories can no longer offer an authoritative explanation of how things are, the consequent moral implications they once carried are easily dismissed as irrelevant to contemporary society. Misunderstanding the shift in authority causes confusion, and brings traditional religion into disrepute. Cartoonists and cheerful secularists love making Noah's Ark and other biblical stories look ridiculous in the light of science.

When challenged, Christian students may feel pressured by books, teachers, or social media into making an apparently simple decision to believe either one or the other of what appear to be mutually exclusive sources of authority. This is very difficult for students from conservative backgrounds if they perceive value and personal identity in, say, both evolution and creation, and are unwilling to reject either of them. One easy response is to avoid the conflict altogether, by putting the two sets of ideas into separate boxes. Others feel driven to make a hard choice between rejecting science as threatening the established traditional ethical structure of the world—and thereby limiting their future intellectual horizons—and rejecting all religious ideas as cultural inventions irrelevant to modern thinking, thereby limiting their spiritual connections.

Creationism in Schools

How many students in Australian and New Zealand schools could be affected by the mental consequences of this dilemma? More than one might expect, concluded Ron Numbers and John Stenhouse, after conducting a detailed historical review of antievolutionism in the Antipodes. Education in both countries has always been compulsory, free and secular, but secularisation, doubled by the regress of mainstream forms of religious belief, has not been as inevitable nor as complete as might be assumed.[2] The existence of an organised entity promoting so-called "creation science" shows that, against the odds, "scientific creationism" has established a beachhead in the Antipodes.[3] In New Zealand, at least, creationism has not invaded science teaching on anything like the scale it has in the USA, but it imports many resources from there. It continues to grow in influence despite a series of official

2 R. L. Numbers and J. Stenhouse, "Antievolutionism in the Antipodes: From Protesting Evolution to Promoting Creationism in New Zealand," *The British Journal for the History of Science* 33 (2000): 335–350.

3 T. Frame, *Evolution in the Antipodes: Charles Darwin and Australia* (Sydney: University of New South Wales Press, 2009).

curriculum modifications intended to help students understand the wider implications of evolutionary theory.

Understanding Darwinian logic is essential for science students, because it is the skeleton reaching throughout our understanding of the structure of the natural world, just as the bones reach through the body of a vertebrate. Recent curriculum modifications[4] were accepted by most biology teachers as important and necessary, but they

> met some resistance from those opposed to teaching evolutionary biology on both religious and cultural grounds … [students] educated at "special character" schools rather than within the state school system can still be taught a curriculum based on a creationist worldview … [or in other schools where] relevant sections of the curriculum become "the part we don't teach."[5]

Such students are tragically ill-prepared to accept advanced biology teaching at senior level. Over more than 25 years of teaching evolutionary zoology to tertiary students I was often saddened to meet students from communities of faith who struggled to reconcile different views of the world. One that I remember especially well never missed a lecture; did all her assignments well and on time; and clearly understood the content of my teaching on evolutionary biology. In tests and exams she always knew what answers were required, and wrote them out clearly and efficiently. The science was clear in her head, but, she told a friend, who told me, in her heart she didn't believe a word of it. These issues are especially difficult for teachers in multicultural societies striving to introduce Western science to students from many different traditional backgrounds. More importantly, it seems to me essential to understand how this ancient and unnecessary war between

4 A. Campbell and K. Otrel-Cass, "Teaching Evolution in New Zealand's Schools: Reviewing Changes in the New Zealand Science Curriculum," *Research in Science Education* 41 (2011): 441–451.

5 A. Campbell, "Evolution Education in New Zealand," in *Evolution Education around the Globe*, ed. H. Deniz and L. Borgerding (Springer, 2018), 431–446 at 431.

traditional sources of authority and contemporary science arose, and how it might be defused.

Towards Mutual Tolerance

The tragedy is that there is in fact no need for any such conflict. To understand why not, we need to appreciate the history of this hoary old debate and the value and importance of respectful engagement with both sides. Both contemporary science and long-established cultural traditions understand themselves and each other in their own terms and as non-competitors. A well-informed evaluation of the literature, the historical roots, and the present significance of these ideas can help us move beyond the painful and often misinformed disputes about the important matters with which both are concerned. Science can support the intellectual enquiry, and religion the meaningful reward.[6] Incompatibility in starting points is not necessarily fatal so long as negotiation is intelligent and respectful. A naturalistic account of morality of the sociobiologist may go so far, but ultimately it cannot go as far as Christianity teaches in the name of the Lord. In turn, Christian Darwinians rejoice in the way that God has created positive ethical values through the natural processes of evolution, says Michael Ruse.[7]

A good starting point is to take ancient Hebrew philosophy seriously, not necessarily to promote biblical belief, but because its basic premises, that the world is intelligible, good, and contingent, provide the foundations of rational thought today. Contemporary science is possible only because it ultimately relies on all these statements as true.[8] Likewise, religious beliefs come in a great variety of forms, but the common grounds that ultimately unite them are more important than their differences. Intelligent faith is entirely compatible with sci-

6 J. Polkinghorne, *Science and Creation: The Search for Understanding* (London: SPCK, 1988).

7 M. Ruse, "Can a Darwinian be a Christian? Sociobiological issues," *Zygon* 35 (2000): 299–316.

8 H. Turner, *The Roots of Science* (Auckland: Deepsight Trust, 1998).

ence, when both are wisely understood.[9] Both are widely misrepresented in the media, however, as the loudest proponents of both rely on combative propaganda, rather than on respectful engagement with the other's real intentions and most thoughtful literature.

To avoid being drawn into one or other side without understanding the real issues, we need to approach each other, and our different worldviews, with great respect. That in turn requires us to understand how and why we normally make decisions between conflicting opinions, and why efforts to make truly objective conclusions are so often unconsciously sabotaged by prior experience. Our eyes are not cameras. Rather, what we can see and understand is very strongly influenced by what we already know.

Models of Invisible Realities

Reality comes in a staggering range of sizes, colours, and patterns, but we can perceive with our eyes only a small range of physical dimensions and wavelengths of the visible spectrum. So, the question is, how can we understand the things we cannot see? One answer is, by creating verbal or mathematical models to represent them. Models are defined by Arthur Peacocke[10] as imaginative human constructs, incompletely representing certain aspects of reality for particular purposes. Models allow us a glimpse of what is not observable, but because they are neither exactly real nor merely useful fictions, they must be taken seriously but not literally. The same definition is appropriate for the models used in both science and religion. All models are wrong to some extent, but some of them are useful.[11] Writers who treat incomplete models, based on abstractions, as if they were as concrete as real life, easily fall into what Alfred Whitehead called the "fallacy of misplaced concreteness."

9 I. G. Barbour, *Religion and Science: Historical and Contemporary Issues* (New York: HarperCollins, 1997).

10 A. Peacocke, *Theology for a Scientific Age*, enlarged ed. (London: SCM Press, 1993).

11 Comment attributed to the statistician George Box.

Models in both science and religion suffer from the alacrity with which their followers tend to impose their own assumptions on sources that originally meant something quite different. Both science and religion are vulnerable to what might be called the "cart-before-the-horse" syndrome, by which the meaning of a model can be completely reversed. Critical realism is needed to avoid this error and, further, to accept that models change over time as new information emerges, otherwise both sides find themselves attacking the wrong targets.[12] For example, the most common cause of misunderstanding neo-Darwinism is that people tend to think of adaptive evolution as a force, and talk of it as "driving" changes, and even of "harnessing" it. Actually, adaptive change over time is more like a cart, and the horse it follows is the differential breeding success of animals in a variable population. Adaptation is the *consequence* of natural selection, so the popular view that thinks of natural selection as a purposeful process is quite wrong—by definition, it cannot work for the good of the species.[13] A process that can be understood only backwards cannot logically be driven or used by anyone, not even by God. Misunderstanding of this crucial idea is often a key point of contention in the war between evolutionary biologists and religious fundamentalists.

In religion, in turn, there is widespread reluctance among ordinary believers to consider any scientifically informed reinterpretation of creation. This attitude is mistaken, because it prevents recognition of how much science and religion are similar under the skin. All practicing scientists have to depend on reasoned trust beyond current data, just as religious believers do. Traditional religions invest certainty and trust in mythical stories containing truths without knowledge of their veracity. Science is trust in organised knowledge without certainty, which is why we need confidence limits around scientific results.

12 C. M. King, "Models of Invisible Realities: The Common Thread in Science and Theology," in *Creation and Complexity: Interdisciplinary Issues in Science and Religion*, ed. C. Ledger and S. Pickard (Adelaide: Australian Theological Forum, 2004), 17–48.

13 The first and still clearest explanation of why not was provided by R. Dawkins, *The Selfish Gene*, second ed. (Oxford University Press, 1989).

Is There Really a War Going On, in This Day and Age?

Classical ancient societies were much more tolerant of dissent than we are. The Romans and the Greeks worshipped many different gods, in part because they did not regard any of them to be right to the exclusion of all others. The Athenians of Paul's time covered all possibilities by erecting an altar "To an unknown god" (Acts 17:23). Roman religion was polytheistic, and readily welcomed the gods of the peoples and territories they conquered. Ironically, the only religion the Romans attempted to eradicate was the one whose success their Empire made possible.[14] Contrast that enviable classical open-mindedness with the modern US, where disagreements frequently descend into a die-in-the-ditch battle between opposite positions on what the two sides take as nonnegotiable eternal truths. Popular writers eagerly describing comparable disputes between believers and secularists as a "War between Science and Religion"[15] do not realise that, amid the uproar, the intellectual content of the issues themselves often become invisible under what philosopher Mary Midgely describes as "a deep snowfall of virgin ignorance."[16] Ideologies divorced from classical theism quickly become topics of extensive and often polarising public debate on matters of moral and social significance, such as the ethical implications of genetic modification, abortion, sexual identity, and the difficulties of teaching evolutionary biology in faith-based schools. Those who know such arguments from the inside can appreciate exactly what Midgely means. Here is Alister McGrath, delivering his Inaugural Lecture on taking up the Andreas Idreos Professorship of Science and Religion at Oxford University, on 20 October 2014:

14 M. Beard, *SPQR: A History of Ancient Rome* (New York: Liveright Publishing and W. W. Norton Co., 2015), 519–520.

15 J. Hardin, R. L. Numbers, and R. A. Binzley (eds), *The Warfare between Science and Religion: The Idea That Wouldn't Die* (Baltimore: Johns Hopkins University Press, 2018).

16 M. Midgley, *Beast and Man: The Roots of Human Nature* (London: Methuen University Paperback, 1978), 14.

> This "science versus religion" narrative is stale, outdated, and largely discredited. It is sustained not by the weight of evidence, but by endless uncritical repetition, which studiously avoids the new scholarship which has undermined its credibility … the so-called "warfare" model of the relation of science and religion is a social construction of late nineteenth century Western culture, reflecting both the professional aspirations and lack of proper historical insight of that age … it is a tired and inadequate stereotype of perennial and essential hostility, which is in any case falling to pieces of its own accord, even though news of this seems to be taking more time than might be anticipated to percolate downwards.[17]

So There Is a War, but Who Is Fighting It, and Why?

The prerequisite for starting a war is that the opponents are no longer willing to listen to each other. The old rules requiring intelligent, measured, and courteous discussion ensured that the valid points of an opponent's view be at least acknowledged before its faults are criticised in impersonal, calm terms. Such civilised constraints tend to get forgotten the more the argument heats up. By the time a debate turns into outright warfare, any credit allowed to an opposing view is somehow seen as a weakness in one's own position. Therefore, to understand why the issues at stake so readily descend from discussion into outright conflict, we have to look at how each side perceives the arguments, as they themselves present them, and the reasons they are held so passionately.

Religion against the Sciences

One of the most widely recognised flash points concerns the direct contradiction between religious belief in the origins of the universe as a divine *fiat* completed in six days versus the 13.7 billion years of cosmic history described by science. They cannot both be literally true. Which, then, should be taught in schools? The fight between creation-

17 A. E. McGrath, "Conflict or Mutual Enrichment? Why Science and Theology Need to Talk to Each Other," *Science and Christian Belief* 27:1 (2015): 3–16.

ists and scientists for control of the education curriculum has, in some times and places, convulsed whole communities.[18]

The idea of religion waging a war against science is so far embedded in the popular view of the world, that uncritical commentators on both sides tend to assume it is inevitable, needs no explanation, and has been going on since time began. In fact, it is a historical artefact of surprisingly recent origin, and is not found in all religions, at all times, or everywhere. It is a recent product of materialism, the metaphysical view that only physical matter and its properties can exist. The logical implication of this view is that science can confirm the existence of only those things it can measure, which in turn defines the only questions that scientific methods can answer. Materialist ideology rejects existence of metaphysical realities, especially anything dressed up in religious attire, or purporting to detect purpose or meaning anywhere in the universe. Edward Feser calls materialism "the last superstition."[19] But materialism is not the last word on the matter. Scientism is an illegitimate extension of materialism, asserting that nothing is real, nothing *can* exist, visible or invisible, outside the purview of science. Related, hardcore materialism is a recent view favoured by secularists, as in Carl Sagan's oft-quoted phrase, "The Cosmos is all that is or ever was or ever will be."[20] The giants of early science, who established the Royal Society of London and their contemporaries who saw their work in science as following in the footsteps of God, would have been astounded by any such propositions. But they might have agreed with the implication that it is materialism, not science itself, which is the enemy of religion.

For most of the history of Western civilisation, no such view was conceivable of philosophy or theology. Within Christianity, the early church fathers of the third and the fourth centuries, who lived surrounded by tolerant pagan societies, saw no conflict between religious and secular knowledge. Augustine of Hippo (354–430), who lived

18 K. R. Miller, *Only a Theory: Evolution and the Battle for America's Soul* (New York: Viking, 2008).

19 E. Feser, *The Last Superstition: A Refutation of the New Atheism* (South Bend, IN: St Augustine's Press, 2008).

20 C. Sagan, *Cosmos* (New York: Random House, 1980), 4.

during the last days of the Western Roman Empire, had grown up with the Roman indifference to incompatible religious and secular ideas. Accordingly, he produced a series of allegorical and literal interpretations of Genesis, an attitude whose wisdom is still relevant. In the Middle Ages, Thomas Aquinas (1225–1274) integrated biblical traditions with the newly recovered Greek science. He took both Genesis and Aristotle's picture of the geocentric universe as true, fusing them into a religious cosmology emphasising an ordered world guided only by divine wisdom. The clearest description of it and its implications for the culture of his time were described by the Italian poet Dante Alighieri (1265–1321) in his masterpiece *The Divine Comedy*. This view was universally accepted until the emergence of a separate system of thought, now known as science (but then called "natural philosophy"), and has no modern equivalent except among extreme literalists.

According to Jurgen Moltmann,[21] perceptions changed after the fifteenth and the sixteenth centuries, when the revolution of thought sparked by Copernicus allowed the sciences to emancipate themselves from Aristotelian physics and cosmology. Meanwhile, theology detached its doctrine of creation from cosmology and reduced it to a personal belief in a creator rather than the things that have been created. The two disciplines established, after many struggles, their own identities on either side of accepted demarcation lines, and achieved a peaceful coexistence based on mutual irrelevance. Many would say that they still are irrelevant to one another. By contrast, one recent view asserts that it is the religious arrogance of Christianity itself that is ultimately to blame for the conflict. As John Gray put it:

> Unbelief is a game whose rules are set by believers … atheism is a late bloom of the Christian passion for truth. Christianity struck at the root of pagan tolerance of illusion. In claiming that there is only one true faith, it gave truth a supreme value that it had not had before. It also made disbelief in the divine possible for the first time. The long delayed consequence of Christian faith was an

21 J. Moltmann, *God in Creation*, trans. M. Kohl (London: SCM Press, 1985), 33–34.

> idolatry of truth that found its most complete expression in atheism … [By contrast,] the natural sciences have unveiled a universe far larger, older, and stranger than anything previously imagined … which our ancestors knew nothing about … [where] the traditional [non-Christian] spiritual connections with the more-than-human world found meaning and significance everywhere.[22]

On the one hand, this idea is superficially appealing, especially when applied to militant evangelism or, especially, politically motivated terrorism disguised in fanatical religious dress. It provides a simple explanation of how outrageous crimes justified in the name of religion, from the Crusades to 9/11, have fuelled the recent avalanche of books damning religious belief by aggressive atheists. It also encourages the flight of thoughtful believers from any form of organised religion. On the other hand, Gray's argument is undermined by a basic misunderstanding of faith, equating it with intellectual assent to irrational religious doctrines of human origin. The real definition of faith concerns trust in an unseen reality, not necessarily religious. One does not have to be religious to trust that the pilot of the plane carrying me as a helpless passenger really does know how to land safely at the right airport.

The Medieval Church Was Not Against Science Itself

Combatants more interested in fuelling the conflict than in calming it inevitably bring up the widely known (and equally widely misunderstood) stories of the battle of the medieval church against Copernicus and Galileo. In fact, in a succinct assembly of evidence contradicting the popular view, M. H. Shank shows that

> it was the early-modern Catholic church that censured Galileo, using a new literalist view of Scripture that would have surprised Augustine and Thomas Aquinas. The crude concept of the Middle

22 J. Gray, *Straw Dogs: Thoughts on Humans and Other Animals* (London: Granta Books, 2002), 19–20, 24–27.

> Ages as a millennium of stagnation brought on by Christianity has largely disappeared among scholars familiar with the period.[23]

The church's early modern reluctance towards the sciences did not draw upon the medieval Christian tradition. That said, however often the cherished myth of the medieval church's opposition to science is contradicted, it is not likely to go away. Many would see that hostility continued in the arguments surrounding the works of Darwin, Teilhard de Chardin, Hawking, and Dawkins, but without recognising either the traditional patterns that precede the modern conflict or the complex motivations behind any author's work. In a thoughtful recent analysis, Gerard Verschuuren picked five scientists, from Galileo to Dawkins, and pointed out that, in every case, the religious objections to their work arose less from their science than from their underlying interpretations.[24]

Verschuuren showed that, for church authorities, the main issues were always the possibility that some suspect ideology, incompatible with Catholic teaching, might lie hidden beneath an otherwise acceptable secular idea. Galileo's heliocentric cosmology (contradicting the church's teaching that the earth is the centre of the cosmos) was rejected for religious rather than scientific reasons. Darwin's theory of evolution was acceptable to most theologians, but his materialism was not. Teilhard was silenced for challenging established Catholic doctrines, not for his geology. The writings of modern atheists like Hawking and Dawkins stem from their materialist ideology, rather than a required conclusion of their science.

23 M. H. Shank, "Myth 2: That the Medieval Church Suppressed the Growth of Science," in *Galileo Goes to Jail and Other Myths About Science and Religion*, ed. R. L. Numbers (Cambridge, MA: Harvard University Press, 2009), 19–27.

24 G. Verschuuren, *The Myth of an Anti-Science Church: Galileo, Darwin, Teilhard, Hawking, Dawkins* (Brooklyn, NY: Angelico Press, 2018).

Science against Religion

Science, as we understand it, did not exist until the mid-nineteenth century. Until then, it was known as natural philosophy, still influenced by the strongly classical content of higher education, and most natural philosophers were ordained clergy. Some combined their work of travelling among the people of rural parishes with carefully documented observations of nature, and wrote wonderfully detailed descriptions which we still appreciate today, such as *Kilvert's Diary* and White's *Natural History of Selborne*. Some also taught classics, logic, and philosophy in long-established schools and colleges. Few of them saw any tension between their faith and the classical understanding of the secular world. The usual narratives, describing the Victorian-era encounter between traditional faith and emerging science as an inevitable turning away from religion, are an exaggeration. So, if the conflict narrative is false, where did it come from?

The Nineteenth-Century Challenge

A closer look at history suggests that the so-called "war" was an artificial "construct created by non-believers for polemical purposes."[25] Over time, it became increasingly important for scientists to assert their independence from religious institutions. T. H. Huxley made a major contribution to the idea of a conflict between faith and secular learning not because he saw that there was such a war, but because he wanted to provoke one. At a time when teaching positions at the only two universities in England were confined to ordained clergy, Huxley aspired to turn science into a profession open to atheists like himself. He needed a war that might challenge the capability of religious teachers to accept the dramatic scientific developments of their age, and so brand them as incompetent. Yet until then the new discoveries in geology and biology had been widely accepted by ministers, teachers,

25 T. Larsen, "War Is over, If You Want It," *Perspectives on Science and Christian Faith* 60:3 (2008): 147–155.

and theologians. The story of Huxley's famous encounter with Bishop Wilberforce in 1860 has passed into legend for all the wrong reasons.[26] Juicy oratory and racy rhetoric[27] allowed fading memories to make an enduring myth.[28]

In fact, the perception that science and religion were in serious dispute did not arise from the Darwinian debates of the mid-nineteenth century, but some decades later. The two foundational documents always cited in this context, Draper's *History of the Conflict between Religion and Science* (1874) and White's *A History of the Warfare of Science with Theology in Christendom* (1896), were late Victorian works of political persuasion, not history. They conveyed the impression that noble, heroic scientists were struggling against repression by odious, manipulative Catholic clergy.[29] They fostered false claims, such as that church authorities denied Columbus' assumption that the world was round, and damaging urban legends such as that the church opposed the use of anaesthetics to ease the suffering of women in childbirth.

In these and other publications, leading nineteenth-century scientists aimed to wrest cultural and professional authority away from the clergy in order to shape future intellectual enquiry and values.[30] Later scholars have pointed out that the works of both Draper and White were written, not with any real intent to present a valid idea, but with an ideological stridency undermined by historical errors and subjective reading of evidence. Unfortunately, both books gained wide influence, supporting (for example) the Soviet attempt to abolish religion in Russia. Between them they established the popular stereotype of warfare that persists among uncritical readers today.

26 J. R. Lucas, "Wilberforce and Huxley: A Legendary Encounter," *The Historical Journal* 22 (1979): 313–330.

27 For example, Huxley probably never did make the now-legendary assertion (against Bishop Wilberforce) that he was not ashamed to have a monkey for his ancestor, but he would be ashamed to be connected with a man who used great gifts to obscure the truth.

28 D. N. Livingstone, "Myth 17: That Huxley Defeated Wilberforce in Their Debate over Evolution and Religion," in *Galileo Goes to Jail*, 152–160.

29 A. McGrath, *Why God Won't Go Away* (London: SPCK, 2011), 82.

30 J. H. Brooke, *Science and Religion: Some Historical Perspectives* (Cambridge University Press, 1991).

The New Atheists

In contemporary world, the battle has been reinvigorated by a new breed of atheists, to whom any sort of organised religion is an historic aberration, or maybe (more charitably) a phase in the continued evolution of humanity's search for itself. They see it as completely irrelevant to the modern world, except as a cheap source of social services. Sunday schools are unabashed systems of indoctrination and should be classified as child abuse, they say. To them, churches are now only empty buildings, which a few people may visit for irrational rituals of ancient origin but in which no one actually lives. Rather like museums, in fact. They promote the general assumption that materialism is a more provable explanation of the world than the unprovable idea of an unimaginably complex, omnipotent creator god. To this new breed of assertive campaigners, all and any efforts to eradicate such cultural nonsense are well justified, and after centuries of struggle and bloodshed, they suppose, the war is now nearly won.

The best known modern warriors against religious belief are a group of vociferous atheists led by Richard Dawkins, Christopher Hitchens, and Daniel Dennett. In 2006, Dawkins stepped far outside his own expertise in zoology to propose, in *The God Delusion*,[31] that it is *in principle* impossible for intelligent people to believe in God. The only rational explanation is that God is a human construct, and that science alone can explain all there is to know about the material world. Therefore, materialism is the best and the only explanation needed. The book has generated a passionate argument, from other scientists who agree that all religion is based on a dangerous delusion to people of faith who are absolutely convinced that it is not.[32]

31 R. Dawkins, *The God Delusion* (London: Bantam Press, 2006).

32 A. McGrath, *The Dawkins Delusion? Atheist Fundamentalism and the Denial of the Divine* (London: SPCK, 2007).

Materialism Is Not as Simple an Explanation as It Might Appear

The key issue is that Dawkins and his colleagues present religion and science as alternatives. But if they understood more about the logical foundations of knowledge, they might realise that their proposition is twice undermined, because, first, the only possible opposite of religion is materialism, not science itself,[33] and second, materialism, so far from being a simple proposition able to describe all that exists, is a less reliable description of reality than is usually assumed. One of the most pithy responses came from fellow Oxford academic Keith Ward, who, tongue in cheek, almost ended the whole issue at one swipe by pointing out that Dawkins

> presents a nicely provocative argument that is well worth defending. Oxford is, after all, the home of lost causes, and it is nice to see a cause as lost as this defended … When Dawkins talks about theology, he is, on his own admission, talking about a subject that does not exist … It is a traditional definition of Oxford scholars that they know everything about nothing. So Prof. Dawkins stands in a good Oxford tradition.[34]

Militant atheists criticise the religious doctrine claiming that God—conceived as an unimaginable complex and preexisting supernatural being—was capable of creating the world, without explaining who created God. Surely, they argue, materialism must be a simpler explanation. The problem is, the more that quantum physics reveals about the structure of subatomic reality, the more the definition of matter gets mysterious. Together with it, all foundations of materialism dissolve in thin air. Ward goes on to explain why:

33 K. Ward, *God, Chance and Necessity* (Oxford: Oneworld, 1996).
34 K. Ward, *Why There Almost Certainly Is a God: Doubting Dawkins* (Oxford: Lion Hudson PLC, 2008), 8, 12.

> The world of philosophy, of resolute thought about the ultimate nature of things, is very varied … but in this world there are very few materialists … Dawkins is setting out to defend a very recent, highly contentious minority philosophical worldview … To most philosophers, materialism has looked like a non-starter. Most of us do not want to deny that material things exist. But we are no longer very sure of what "matter" is. Is it quarks, or superstrings, or the result of quantum fluctuations in a vacuum? … Quantum physicists … talk about a "veiled reality" that we can hardly even imagine, which appears as solid physical objects only when observed … There is something out there, and it appears to us as a world of fairly solid objects. But modern physics suggests that the nature of reality is very different from what we see … What is the point of being a materialist when we are not sure exactly what matter is?[35]

Here is John Haught's explanation of the underlying contradictions of Dawkins' claim that intelligent people (i.e., scientists) cannot *in principle* believe in God:

> If they [atheist critics] would stick to arguing that natural selection is an alternative to *other proposed scientific explanations* of design [in nature], biologists would remain safely outside the theological circle … Instead, they [are] insisting that natural selection is a *substitute for traditional theological accounts* … they believe that science and religious faith are locked in a contest to the death, … as *rivals* for explanatory primacy, and one of them has to lose … by putting it this way, however, they are not yet doing pure science. As a rule, competing parties have to be chasing the same goal in order for any observer to conclude meaningfully that this one rather than the other has won … If science and theology are supposed to be addressing entirely different sets of questions, it makes no sense to claim that one has defeated the other.[36]

35 Ward, *Why There Almost Certainly Is a God*, 14–15.
36 J. F. Haught, *Making Sense of Evolution* (Louisville, KY: Westminster John Knox Press, 2010), 18–19.

Alister McGrath's comprehensive survey of why attempts by atheists and agnostics to dismiss belief in God as irrational and unscientific never work is appropriately titled *Why God Won't Go Away*:

> Historians of science are generally agreed to have shown during the 1970s that the "conflict thesis" was historically untenable. The myths on which it depended so critically—especially in popular secularist propaganda— … have been comprehensively dismantled, and in recent decades popular culture has become increasingly willing to engage with the more messy complexities of history and culture instead of reducing them to mindless slogans and stereotypes … "Science" and "religion" are shorthand terms for enormously complex and diverse beliefs, practices, and communities. Crass generalisations are especially dangerous here.[37]

When challenged by well-informed critics like Midgely, McGrath, and Ward, scientists unaware of the fallacy of comparing unlike propositions, or the weakness of the materialist position, tend to be surprised to find that religion is not so easily dismissed.

Why the War between Science and Religion Is Unnecessary

In hindsight, we can see that the war between science and religion is a real but sad and unnecessary consequence of centuries of mutual suspicion and misinformation, with complicated historical roots. It is the continuation of a long-held and very serious category mistake, of confusing science and religion as *competing* explanations of reality. By exposing the philosophical confusions underlying their separate misinterpretations, and having the benefit of hindsight, we realise that the supposed warfare could be ended, if we want it to be.[38]

Wider recognition that science and religion offer complementary, not competitive, views of life could undermine the uninformed po-

37 McGrath, *Why God Won't Go Away*, 83.
38 See Larsen, "War Is over, If You Want It."

lemics of both sides.[39] Scientists who always work within the rational limitations of science offer no challenge to religion.[40] Likewise, believers with no experience of science need not worry that scientists think religious belief is irrational. They need only point out that scientists also depend on reasoned trust beyond current data, because science and religion have common—ancient and medieval—roots.[41] Science cannot reject classical metaphysics without cutting off the branch it sits on.[42]

The Tree of Knowledge

I suggest that there is a straightforward explanation for this long-standing confusion. Western readers have lost contact with the ancient metaphysical basis of knowledge, because they never encountered it. The long-continued fireworks are fuelled by the failure of modern education to introduce students to the basic ideas of the philosophy of reasoning and to the philosophy of science that underlies the daily work of all scientists. So, they are completely ignorant of the fundamental architecture of reasoning. As John Haught put it, "Everything in our experience can be explained at multiple layers of understanding, in distinct and noncompeting ways … [This idea] is an ancient one, endorsed by Socrates, Plato, Aristotle, Augustine, Aquinas, Kant, and many other great thinkers."[43] A summary of classical metaphysics would therefore be useful. In short, the two levels of reality recognised in contemporary thought are only the first and lower levels of a fourfold hierarchy.

39 K. Ward, *The Big Questions in Science and Religion* (West Conshohocken, PA: Templeton Foundation Press, 2008).

40 M. Dowd, *Thank God for Evolution: How the Marriage of Science and Religion Will Transform Your Life and Our World* (New York: Viking, 2008); Ward, *The Big Questions in Science and Religion*.

41 Barbour, *Religion and Science*; Turner, *The Roots of Science*.

42 See Feser, *The Last Superstition*.

43 Haught, *Making Sense of Evolution*, 23.

Level 1 Material Reality

Material reality is the ground level of our daily experience—measurable, touchable, temporary, and variable between measurements. The DNA molecule is a material reality, and subject to mutation, but is equivalent only to the paper on which a message is written, not the message itself.

Level 2 Information

Information is as real as is material reality, but differs from it in being invisible, and relatively permanent down a given lineage, though not immortal. It is the *order* of the bases along the DNA strand that contributes to the formulation of a gene, the information passed on to the cellular machinery, not the separate material reality of the DNA molecule itself. The message is conveyed in triplets, three-letter "words" in molecular code, which can be changed by mutations in the same way a word within a document on screen can be edited. The code is the message, and after editing carries a slightly different piece of information on the same strand of DNA. Most genetic messages are long-lived down a lineage, bar occasional mutations, which are rare especially in those controlling vital bodily functions necessary for life, like breathing. Mutational changes are interpreted and actioned by the cell, as a revised message can be printed out on a fresh piece of paper. So information is a variable construct, which will die out together with the last bodies that carry it.

Richard Dawkins points out these vital distinctions in a little-known book chapter entitled "Replicators and vehicles" (in his terms, replicators are genes, and vehicles are bodies).[44] He perceives that the two forms of reality interact in physical space. To use Aristotelian categories, genes represent potential reality, as opposed to the existing material reality of a body. Dawkins does not think of them that

44 R. D. Dawkins, "Replicators and vehicles," in *Current Problems in Sociobiology*, ed. Kings College Sociobiology Group (Cambridge University Press, 1982), 45–64.

way, but does point out an equally radical difference between them: replicators (genes) can be copied, but vehicles (bodies) cannot. Rather, all physical bodies must be reconstructed afresh every generation, only from the information held in fertilised eggs, copied from their parents. Only the body is a material, short-lived object. All bodies die, however successful. Their inheritance and their legacy consist only of information, which is copied and recopied down the generations indefinitely. Natural selection determines the differential success of variable individuals in returning copies of their genes to the species' pool.

Grasping the critical differences between these two levels of reality is essential to understand how physical evolution works. And, indeed, together they are enormously satisfying sources of explanation of the world at the sensory level, especially when allied to sophisticated mathematical models. Materialists do not see that more needs to be said. They use numerical analyses without asking where numbers come from, or why mathematics is so extraordinarily successful in explaining the workings of the universe. This, as Einstein commented, is a central mystery: Why is the universe so intelligible? We could answer this question better by retrieving the discredited ideas of the classical philosophical tradition that underlay all Western thought, from Plato, Aristotle, Augustine, and Aquinas to the Enlightenment—that a complete explanation of how things are and which things matter, in both religion and science, is knowable through the rigorous application of *reason*.

The first two levels of reality, as summarised above, can be understood through the senses, but above them are another two levels, which can be known only through the intellect.

Level 3 Universal Realities

Universal realities are preexistent; they precede any human mind, remain real and invariable whether they are ever observed or not, and (in contrast to the second level of reality, information) will still remain after the last humans have died out. They include realities that all scientists have to take for granted in their ordinary work. Numbers (e.g.,

2 + 2 = 4) have existed and been true before humans evolved and will remain true after they have all gone. The spectrum of wavelengths produced rainbows and the speed of light was the same when only dinosaurs had eyes to see them, and indeed long before the dinosaurs existed. The cosmological constants set within the first few minutes of the Big Bang have remained the same ever since. These realities are therefore not the product of human intelligence or observation. But science cannot work without them, and most scientists since the 1600s have been able to use these immutable universals only by confusing them with the quite different and variable reality of Level 2 information.

Level 4 Ultimate Reality

The ultimate reality is far above the sensory world. It can be known only to the intellect, but it explains where all the other levels of reality come from, what they are for, and supplies their standards of reference. It is the originator of all existence, life, and goodness, giving us an objective measure by which to judge the experiences and behaviour of ourselves, of everyone else, and of everything around us. It is the ultimate source of morality and faith, both grasped objectively rather than via the variable input from our senses and social environment. (N.B. "morality" in this sense is a higher level concept than "moral values," which is a subjective human idea requiring a Level 2 valuer.) Some people will identify the ultimate reality with God; materialists unwilling to allow any sort of divine foot in the door will deny that any such reality exists.

To Make Sense of Reality

An image might help translate what sound like strange ideas into a more familiar picture. Imagine a tree, a giant of the forest standing proud in a clearing, a symbol of the four levels of reality. The *roots* represent the Level 1 realities, drawing material sustenance from the soil. The *trunk* represents Level 2, the information derived from human observation

of the health and functioning of the roots, interpreted though a scientific model. Other trees draw materials from the same soil but manage them differently, which is why we can observe different species of trees growing together in the same forests.The *canopy* represents the Level 3 realities, the leaves and fruit derived from human analyses using the essential and respectful collaboration of variable information with invariable universal realities such as mathematics. Atheists do not recognise the vital difference between temporary information and immutable universal realities, so cannot see a fruitful canopy, only bare branches leading to pointless polemics like the historical war between science and religion. The *sun* above the forest represents Level 4, the source of life and energy for all forest trees, and all other living beings. Atheists cannot see it through a thick cloud of prejudice against any sort of supernatural entity.

Aristotle's famous system of four causes[45] offers a parallel set of explanations for the existence of a tree. The *material cause* is the availability of nutrients and water in the soil. The *formal cause* is the genome of the tree species that controls how those supplies are taken up and fed into the cellular machinery producing the physical structure of the tree. The *efficient cause* is the action of natural selection in choosing between variant genomes within the tree's lineage, and granting differential reproductive success to those genes most fit (i.e., most frequently copied) in a given environment. The goal of reproductive success is the *final cause* for which the tree, and all other trees, exist. Interpreted through classical theism, the final cause is the ultimate purpose of God, the reason for the existence of creation. It provides a rational explanation of nature as deriving from the love of a rational God, leading to further insights regarding "the deep intelligibility of the universe."[46] It is the rational answer to Einstein's question.

Most contemporary scientists can accept the first three Aristotelian causes, although thinking of them in different words, but the last

45 Barbour, *Religion and Science*, 5.

46 J. Polkinghorne, "Christianity and Science," in *The Oxford Handbook of Religion and Science*, ed. P. Clayton and Z. Simpson (Oxford University Press, 2006), 57–70, esp. 64.

is rejected as unscientific and unnecessary teleology. Yet, cutting off the intellectual reassurance provided by the top level of a hierarchical system of explanation converts all lower levels into mere human speculation. If more rational people could step outside their automatic rejection of metaphysical ideas that sound as ancient and irrelevant as these, we might be better equipped to see why the so-called "war" is not between science and religion as such, but between modern naturalism and the classical worldview. Naturalism, and its offspring, materialism, scientism, and secularism, undermine reason and morality, and lead to the irrational worldviews they falsely attribute to religion.

If we remove the blinkers so much beloved by the New Atheists, we might find it no bad thing to be in the company of the giants of early science on whose shoulders we stand, such as the first Fellows of the Royal Society Robert Boyle, Christopher Wren, John Ray, Isaac Newton, and many others.

Time to End the War

An armistice is a formal agreement between warring parties to stop fighting. It is not necessarily the end of a war, if hostilities are only paused while negotiators search for a solution to a continuing disagreement. But if some form of lasting peace can be found, an armistice can lay the groundwork for a real end to the war. How can we apply this idea to a strategy for ending the war between science and religion?

Take Each Other's Literature Seriously

We could start with a serious effort to explain the importance of understanding the philosophy of knowledge to all parties concerned, including bystanders. Centuries of mutual misinformation spread among the disengaged general population cannot be mended overnight. But anyone who really wants to get to grips with the literature of both sides now has a huge range of resources available, some from unexpected secular resources. For example, ecological science has long identified

the principle of competitive exclusion, whereby two or more similar species cannot survive on a single limited resource, unless they develop mutually exclusive methods of exploiting it. Two types of barnacles may compete for attachment sites on rocks, but they coexist because one grows faster near the low tide level, and the other tolerates longer exposure to air near the high tide level. Ecological principles are already influencing secular ethics and environmental management.[47]

The same principle can be applied to the debate between science and religion. Both observe the same world, but they can coexist because they ask mutually exclusive questions. Science is a system of repeatable experiments capable of proof by recurrent, knock-down testing, whereas religion is a system of metaphysical propositions best interpreted by love. Science is usually regarded as objective, and religion as subjective, although neither is purely so, and there is much overlap between them. Closer attention to the wide range of ecological texts on how different species coexist in nature could help provide examples to defuse the distressing confusion between complementary versus rival explanations.

The dispute has generated more and more thoughtful books with "God" in the title over the last two decades. Most are written by authors with a deep knowledge of and commitment to their subject, expressed in terms accessible to the nonprofessional. Many of these books stimulate, or follow, the aggressive polemics of atheists. For example, Francis Collins' 2007 reasoned defence of faith in *The Language of God* was followed by Christopher Hitchens' 2008 attack *God Is Not Great.* Daniel Dennett's 1995 dismissal of *Darwin's Dangerous Idea* misinterpreted the theory of evolution in many respects, most of them courteously corrected by John Haught in *God after Darwin* (2000) and *God and Evolution* (2006). Richard Dawkins' attacks on religion in *The God Delusion* (2006) prompted an immediate response from Alister McGrath (2007), predictably entitled *The Dawkins Delusion*. The long-running row over the

47 P. G. Fairweather, "Links between Ecology and Ecophilosophy: Ethics and the Requirements of Environmental Management," *Australian Journal of Ecology* 18 (1993): 3–19.

teaching of Darwinism in American schools is clearly explained from both points of view by Michael Dowd in *Thank God for Evolution* (2008). Jerry Coyne's opposite view is laid out in his 2015 book *Faith Versus Fact.* And there are many more. Edward Feser is astonished by "the sudden rise of ostentatious unbelief as the *de rigueur* position of the smart set … atheist chic is now, out of the blue as it were, the stuff of bestsellers, celebrity endorsements, and suburban reading groups."[48]

It is true that selective perception makes it difficult to read about, or even to understand, ideas that do not fit into one's existing mental pigeonholes. A person's core beliefs, their established view of the world and the primary support of their personal identity, must be defended against every challenge. So it takes a genuinely open mind to range across such a broad spectrum of interpretations of the one world that we all share. In turn, in the age of the internet it is no longer sufficient to hide prejudice behind either disinformation (deliberately intended to mislead) or misinformation (which could be genuinely mistaken).

Apply the Rules of Logic to Both Equally

The climate of mutual suspicion generated by the warfare model could be dispelled more readily if the outspoken advocates of conflict could be persuaded to listen to knowledgeable people on both sides, and make their responses reasonable. For example, it could be argued that Dawkins' strident trashing of all religious belief has driven an unprecedented level of reactions, both from the rational defenders of mainstream faiths, and from the outraged members of the more peripheral groups who are the primary targets of his attacks. Conversely, the anti-intellectual bias of fundamentalist groups seems to have fed directly into less than reasonable popular resistance movements against proven public health measures such as vaccination and fluoridation. Both sides could benefit by paying more attention to Sir Peter Medawar's warning that "the intensity of the conviction that a hypothesis is true has no bearing on whether it is true or false. The importance of the strength of our

48 Feser, *The Last Superstition*, xiii.

conviction is only to provide a proportionately strong incentive to find out if the hypothesis will stand up to critical evaluation."[49]

Certainly, there are aspects of religious belief accumulated over centuries which need to be pruned off, but people are already doing that—starting with Christ himself in his challenges to Jerusalem temple authorities, not to mention Martin Luther's history-changing attacks on corruption in the Roman Catholic church of his time. The advance of biblical scholarship over the last 200 years is continuing the process, although it is more visible in colleges of theology than among most congregations. Contrariwise, there are aspects of contemporary scientific culture that fully deserve criticism, especially the failure to teach students any of the basic philosophy of knowledge that could protect them from jumping to false conclusions. For example, the widespread atheist assertion that Christian faith is irrational goes back to an inductive argument somewhat along the following lines: natural science can find no rational evidence for the possibility of life after death; Christians believe in the resurrection of the dead and in many other supernatural miracles; therefore, Christian belief is irrational.

It is true that there is no scientific evidence for life after death, and also that the apparently illogical belief in supernatural events is widespread among Christians, but those premises cannot lead to a general conclusion that Christian faith is inherently irrational. Christianity also includes many other entirely rational beliefs that improve the world we live in, such as compassion for others, which is the historic basis of medieval hospitals, antislavery legislation, and many contemporary secular organisations like the Red Cross and St John Ambulance. When people from opposite backgrounds agree on how to discuss their differences with respectful attention to the rules of inference,[50] the false generalisations that feed the conflict can be disarmed.

49 P. Medawar, *Advice to a Young Scientist* (New York: Basic Books, 1979).

50 Any textbook on philosophy can explain the perils of inductive reasoning and the rules governing the derivation of conclusions by inference.

Recognise the Ways in Which Each Needs and Can Enhance the Other

One of the most respected scientists of all time, Albert Einstein, had no personal religious belief—at least, as an adult—but he had a clear grasp of why science and faith need each other. His most famous quote on the subject is best understood in its full context:

> Science can only be created by those who are thoroughly imbued with the aspiration toward truth and understanding. This source of feeling, however, springs from the sphere of religion. To this there also belongs the faith in the possibility that the regulations valid for the world of existence are rational, that is, comprehensible to reason. I cannot conceive of a genuine scientist without that profound faith. The situation may be expressed by an image: science without religion is lame, religion without science is blind.[51]

Rationalists need faith in reason, but the serious faithful also need reason to make sense of their own traditional texts and convictions. It is entirely possible to understand the story of Adam and Eve in the Garden of Eden in terms of the evolution of the human brain, for example, without rejecting its ancient interpretation of human nature as profoundly true.[52] Such an alternative explanation describing our deepest moral conflicts as natural, rather than a drastic moral failing, offers an escape from centuries of guilt and grief imposed by the religious idea of original sin. The religious message does not have to be destroyed, although when read superficially it is very frequently misinterpreted. Furthermore, in England, some of the most important religious ideas on social equality, hospitality, community care, and the treatment of criminals were astonishingly radical for their time, and secular authorities have been catching up ever since.

51 Cited in J. F. Haught, *Science and Religion: From Conflict to Conversation* (New York: Paulist Press, 1995), 44.

52 C. M. King, "Genesis 1–3 as a Resource for Twenty–First Century Faith," *Christian Perspectives on Science and Technology*, New Series, 1 (2022): 1–27.

The long rearguard action by the nineteenth-century church against the theory of evolution and all its implications is described by Mary Midgley as a

> bizarre tactical aberration … the church exhausted, distorted, and discredited itself in order to combat a quite imaginary danger. Most Christians today readily accept that the earth does not have to be in the centre of the universe, and that God, if he could create life at all, could do it just as well through evolution as by instant fiat.[53]

But, regrettably, that does not mean the end of the war. Religious warriors now target, with equal ferocity, the new issues undreamed of by our ancestors, in the fields of genetics, criminal responsibility, right-wing politics, and LGBT sexuality. We need to understand more about how to defuse such present and future disputes with understanding and compassion, starting with abolishing the metaphor of war.

One of the central problems of teaching, in both science and religion, is explaining new knowledge in contemporary terms. Ancient truths still regarded as valid in all times and places cannot be passed down from one generation to the next in their original form, as if human societies lived in a cultural vacuum. Far from it. All forms of knowledge have to be expressed in terms of culturally defined metaphors and models that speak to their present audiences,[54] as interpreted through personal experience. Cultures vary so widely that images formulated in one society quickly fall flat in a different one.[55]

There is a growing number of genuine scientists with impeccable qualifications willing to promote a more civilised conversation. For example, leading cell biologist Kenneth Miller argues persuasively that science cannot assign meaning or purpose, but that doesn't mean the world is devoid of them. "True knowledge comes only from a combina-

53 Midgley, *Beast and Man*, xix.
54 S. McFague, *Models of God: Theology for an Ecological, Nuclear Age* (Philadelphia: Fortress Press, 1987).
55 King, "Models of Invisible Realities."

tion of faith and reason."[56] In turn, theoretical physicist Sir John Polkinghorne wrote:

> We need both science and religion, and ... they have many important things to say to each other ... I'm driven by the need to take both science and religion seriously, and am sure that they are friends, not foes, in the common quest for knowledge ... [It is not true that] religious belief is outmoded, or downright impossible in a scientific age ... if people ... knew a bit more about science than many of them actually do, they'd find it easier to share my view ... science and faith are intellectual cousins under the skin. Both base conclusions on an interplay of interpretation and experience; both are always open to modification, both attempt to understand.[57]

Furthermore, Francis Collins, leader of the Human Genome project, pointed out that "science is the only way to answer questions about the material universe, but is powerless to answer questions about meaning. We need both, to understand both the seen and the unseen."[58] As Rabbi Jonathon Sacks put it, "Science takes things apart to see how they work; religion puts things together to see what they mean."[59] In demonstrating the interplay between random mutation and nonrandom selection, that is, between chance and law, evolutionary theory is, in Arthur Peacocke's expressive phrase, "theology's friend in disguise."[60]

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56 K. R. Miller, *Finding Darwin's God: A Scientist's Search for Common Ground Between God and Evolution* (New York: Harper Collins), 267.

57 J. Polkinghorne, *Quarks, Chaos, and Christianity: Questions in Science and Religion* (London: Triangle and SPCK, 1994), xii, 11.

58 F. Collins, *The Language of God: A Scientist Presents Evidence for Belief* (London: Simon & Schuster UK, 2007), 6.

59 M. Rosenfeld, "Guardian of the Crossroads: A tribute to Rabbi Sacks" (2020), available at https://www.google.com/search?q=Guardian+of+the+Crossroads%3A+A+tribute+to+Rabbi+Sacks (accessed 20 May 2023).

60 A. R. Peacocke, "Welcoming the 'Disguised Friend': A Positive Theological Appraisal of Biological Evolution," in *Vatican Observatory/CTNS Conference* (Rome: 1996).

Indeed, religious teaching can contribute to our shared knowledge when its insights are verified by reason. For example, forgiveness of past wrongs can lead to the calming of tensions, and eventually to cooperation, as confirmed downstream by game theory[61] and social psychology. Who can forget the inspiring healing, dignified bearing of the man who lost his wife in the attack on two mosques in Christchurch, standing in court and offering forgiveness to the terrorist?

Believing people have generally been slow to realise the implications of Darwinian biology for their worldview. It is not that radical reinterpretations of old assumptions are impossible within a conservative religious organisation; liturgical reforms and feminism have made sweeping changes over the last few years, for various reasons, not all purely religious. The main trouble is that most believers do not know enough about Darwinian biology to be able to see its implications for their faith.[62] Accordingly, many tend to fear it as a rival explanation for the mystery of life. As Midgley puts it: "People's difficulty about seeing themselves as members of the one creation has come from a crude, narrow, highly abstract notion of what the other members were like."[63]

On the contrary, if the two perspectives can be seen as partners to be taken seriously, as they were in the classical tradition, there is great hope for the future. Science emphasises the dynamic aspect of evolution which creation theology had temporarily forgotten, and at the same time is raising various questions that are outside its own province to answer. Modern medical science encounters many life-or-death dilemmas where science and ethics cannot avoid meeting, and the solutions are often rooted in religious tradition. All universities and research institutions have Ethics Committees to monitor the work of their scientists in terms that ultimately go back to ancient biblical principles.

61 R. Axelrod, *The Evolution of Co-Operation* (London: Penguin Books, 1984).
62 Some examples are available online at https://www.stpeter.org.nz/god-talk (accessed 1 September 2023).
63 Midgley, *Beast and Man*, 95.

Conclusion

People willing to defend ultraconservative religious interpretations at any cost underestimate the penalties of holding on to outdated core beliefs. For example, by rejecting the overwhelming rational evidence for the global consequences of climate change and sea level rise, religious fundamentalists are not contributing to the collective action now urgently needed to protect the future habitability of our planet. In some countries, they have enough political influence to prevent real action, not because they reject the science, if they have understood it, but for other reasons, including a misplaced faith in biblical literalism, and fear of the challenge of secularism for the authority of Scripture. Like all the rest of us, they or their children will experience the consequent damage to the earth. These are dangerous attitudes to such matters, and they feed on misinformation and the bias promoted by the misuse of social media.

Until recently, the religious fightback against science searched for observations of nature that cannot be explained by science, concluding that they must therefore be evidence of the existence and creative activity of God. This approach has been a costly and distracting mistake, and its corrosive effect on faith is not yet recognised by its most committed adherents. By contrast, says Polkinghorne,

> Natural theology is less ambitious now, it does not speak of proof of God but of why theism offers the most coherent view of reality. The emphasis is not on particular cases (e.g., "irreducible" structures of the eye or the bacterial flagellum) but on the laws of nature permitting the existence of *any* cases. The details of these are acknowledged to be the domain of science, and no question that can be formulated by science should be offered a theological answer … This revised form of natural theology does not rival science on its own ground, as did Paley, but seeks to complement science by asking broader and deeper questions about intelligibil-

> ity itself … Why is science possible at all? Why is maths so unreasonably effective?[64]

Thoughtful defenders of both real science and real religion could have a greater impact if they put aside past disagreements and work together to promote more reasonable debates. This view makes a lot of sense. When do we start?

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64 Polkinghorne, "Christianity and Science," 62–64.