

1. Introduction: Are the Church and science strange bedfellows?

Mention 'the Church' and 'science' in any conversation, and the chances are that the words 'Galileo' and 'the Inquisition' would follow hot on their heels. The way such a conversation is likely to develop is captured succinctly by the actor Richard Griffiths¹, who played the part of Galileo in a production of Bertolt Brecht's play *The Life of Galileo*: 'By stifling the truth, which was there for anyone to see, the Church destroyed its credibility with science.' Griffiths' caricature, or something like it – that 'science' and 'religion' are mutually hostile to one another – is strongly embedded in the popular imagination. Before we can attempt to build a theology of science, a certain amount of 'ground clearing' is necessary.

First we will show that the one-sided 'conflict' model of the relation between science and religion has little *historical* basis. Of course, there has been friction, and the friction has frequently arisen out of a putative incompatibility between science and the *Bible*. We therefore move on to a consideration of the nature of biblical and scientific texts by way of the opening chapters of Genesis. Finally, science and theology are often conceived as necessarily incompatible because of the latter's appeal to *authority*. We end this section with a consideration of the nature of authority in science and theology, showing that it plays a surprisingly similar role in the two disciplines.

1.1 History: moving beyond the 'conflict' metaphor

Historians have in recent decades revisited a number of historical 'flashpoints' which have been presented as occasions when 'theology' took on 'science', inevitably resulting in a bloody nose for the former. Take, for example, the celebrated cases of Galileo (in the seventeenth century) and Darwin (in the nineteenth).

Galileo, it is true, was condemned by the Roman Catholic Church for teaching that the earth orbited the sun. But the scientific evidence for a moving earth was simply *not* 'there for anyone to see'. (The reader may consider how s/he might convince a skeptic using seventeenth knowledge and technology. After all, to an observer on the surface of the Earth there is no sensation of movement, whilst the sun visibly moves across the sky during the course of a day!) The moons of Jupiter, seen by Galileo through his telescope, could at best be an *illustration*, but not a proof. On a wider intellectual front, Galileo's contemporaries were committed to finding truth in ancient texts interpreted according to tradition. Most of them thought that there was no compelling evidence to change their interpretation of what these texts said about the earth. Galileo remained a faithful Catholic to the end, while many of his opponents were astronomers in holy orders. To read the

¹ We have deliberately eschewed the formal academic apparatus of footnotes and bibliographic references, although authors whose work we use are named in the text. On the other hand, we give an annotated list of further reading for those who want to explore the issues raised in more depth.

episode as just a fight between science and theology is not only simplistic: it risks missing a most important lesson – the difficulty of convincing *whatever* dominant authority of the day. (Mitchell Feigenbaum, who made the revolutionary discovery that certain patterns of behaviour of chaotic systems are universal using little more than his pocket calculator, took two years to get his first paper accepted for publication, testament to the conservatism of *today's* scientific establishment.)

Darwin never pronounced on theological matters. He was on good terms with many clergymen throughout his life, and his evolutionary theories were defended by several of them. Darwin's loss of faith later in life was triggered primarily by the death of his daughter, rather than by his science. On his death, no protests were made when he was interred in Westminster Abbey. However, a number of his supporters – most famously Thomas Henry Huxley – insisted that evolutionary theory was opposed to the Church's teaching, and would brook no compromise with the ecclesiastical authorities. To understand what was going on in this case, we must remember that in Huxley's day the profession of 'scientist' did not exist. The 'scientists' of his day, in England at least, were leisured amateurs – indeed, many of them were clergymen. Huxley was determined to wrest control of the scientific establishment from such people; hence his anti-clerical crusade. Again, what lay behind this affair was not the relationship between theology and science *per se*, but rather the particular political and social conditions which obtained at that time. Unfortunately, people with political and social agendas have continued to pit 'science' and 'religion' against each other ever since.

Such analysis has repeatedly shown the inaccuracy and poverty of appealing exclusively to the 'conflict' metaphor in explicating the multi-faceted relationship between science and theology in history. In fact 'conflict' is only one of the four ways in which science and theology could relate, according to the theologian, philosopher and one-time physicist Ian Barbour:

- *Conflict* – the kind of view propagated by the popular retellings of historical cases such as those above. The biologist Richard Dawkins and the physical chemist Peter Atkins are well known contemporary proponents of this view.
- *Independence* – this view assumes that science and theology are both important, but they address different aspects of the human search for truth. It might be argued that science is about generating knowledge, whilst theology is concerned with the right use of that knowledge – with questions of ethics, for example. The paleontologist Stephen Jay Gould's talk of 'non-overlapping magisteria' is a contemporary example of this view.
- *Dialogue* – some commentators are not content with simply affirming that science and theology are important, but separate. They insist that useful and stimulating insights can be had from the dialogue of the two. The majority of writers today on 'science and theology' adopt this view.

- *Integration* – some scholars (such as T. F. Torrance and, in some respects, Barbour himself) believe that it might be possible to produce a comprehensive system which embraces theological and scientific insights.

Note that we need not take these as four ‘cut and dried’ compartments: indeed, some scholars have developed far more complex schemes (usually involving these four elements) in their attempts to be more nuanced in their approaches to the relationships between science and theology.

1.2 The Bible: how we read texts

In many of the historical episodes in which science and religion were supposed to be in head-on collision, one of the underlying issues had been a putative disagreement between what the Bible said and what science taught. Historically, as well as today, such issues often come to a head over the first few chapters of Genesis, especially Chapter 1. We turn now to examine these texts as a ‘test case’ to tease out some of the reasons why the Bible may be deemed to conflict with science.

There is more than one version of the creation story in the Hebrew Bible – and Genesis 1 is somewhat odd among ancient narratives of this kind in *not* starting with a great mythic war between opposing forces, one of them God. Conceivably liturgical in origin, its climax is verse 26, the creation of humankind; and its intention is to address the question ‘why’ rather than ‘how’. In other words it might be said that it addresses the issue of creation from the opposite (but not necessarily opposing) perspective to science. Science begins with observation and accumulates data that prompt questions, while Genesis 1 begins with a theological given (‘God created’) and seeks to understand the nature and purpose of creation, with its focus in humankind, from its given origins (verse 2). It declares the presence of God’s creative activity in all things, and at the same time the radical distinction between Creator and creature. The theological insistence on the doctrine of *creatio ex nihilo* (‘creation out of nothing’) is certainly implicit in the early verses of Genesis, but its fundamental concern is to establish the principle of creation out of chaos and of ‘ordering’. It is this with its faith in the ‘larger hope’ of God’s purpose, far more than any arguments from literal readings of the biblical text, that falls foul of evolutionary principles that find their most celebrated expression in the work of Charles Darwin.

Generalizing from this reading of Genesis 1 and its possible relationship with science, we can say that theology and science should be regarded as different *modes of discourse* (and there are many others). It might be suggested that pre-Reformation understanding of the Bible, that readily sustained four- or five-fold readings of the biblical texts, would have been less susceptible to the nineteenth century controversies between religion and science than biblical interpretation after Luther and Calvin, which suggested that there was only one way of reading and understanding a text. The medieval Franciscan scholar Nicholas of Lyra, for example, proposed

four ways of reading the texts of Scripture: literal, allegorical, moral and anagogical (that is, pertaining to eternal truths). These readings are different, but not contradictory. After the Reformation, biblical interpretation became more 'scientific'. Indeed, the literature scholar Peter Harrison has recently argued that this 'hermeneutical turn' (as it is known) at the Reformation was itself one of the immediate factors that led to the rise of modern science – it gave Western intellectuals the cue they needed henceforth to read the book of *nature* in an equally literal manner, without looking for hidden levels of meaning. Interestingly, however, this 'new hermeneutics' from the Reformation also gave rise to the potential for divergence between the Bible and scientific enquiry in the long run. Quite simply, there was a danger that they were trying to occupy the same space in the enterprise of faith and understanding.

So, if we are to move towards a theology of science, we need to be acutely aware of the nature and claims of biblical language, as also of the language of science. Thus, to turn to a related passage in the New Testament, when John 1 uses the expression 'in the beginning' it is not a temporal statement so much as a claim for the nature of 'being' ('all things came into *being* through him'). It is, in a sense, a metaphor. Both theology and science use metaphors, but in rather different ways, and for different purposes. In the words of the philosopher Paul Ricoeur, we need to clarify both the distinction between and the collective unity of 'modes of discourse as modes of use, such as poetic discourse, scientific discourse, religious discourse, speculative discourse, and so on.'

The biblical accounts of creation are poetic discourses, probably closely linked to liturgical praxis and the government of the way we live in relationship with one another and with God. Their metaphors have a dramatic intensity that is quite distinct from the predominantly scientific understanding of the nature and purpose of text that underlies most of our post-Reformation biblical hermeneutics. Scientific accounts are also metaphorical, but their purpose is quite different, being outside the necessary context of a relationship with God (or even one another). Keeping these distinctions in mind will help us avoid unnecessary problems in the science-theology dialogue.

1.3 Authority: who you listen to

Theology and science are often seen as incompatible because the way theologians are supposed to 'defer to authority' in their work, whether it be written authority (chief among which is the Bible) or authoritative persons (most obviously, the Pope for Catholics). We therefore move to discuss the understanding of authority which obtains in science and religion. To do so, we must first identify the questions which it is believed may be answered by an appeal to authority. Reference to authority is usually made as part of a process of settling disagreement. Disagreement may be in the field of individual belief or in the field of corporate practice. We can therefore usefully begin by considering the notion of belief.

Within the activity of science we may ask the question: If we are taking part in the activity of science, what moves us to give our assent to a particular theoretical point of view? The answer to this question would have many components in it. We may refer to the comprehensiveness of the theory and its ability to explain a wide range of phenomena. We may cite its predictive power. We may make reference to its 'intrinsic beauty' and simplicity. We may see these and other factors as contributing to a cumulative case in favour of our giving our assent to it. There will in addition be a family of factors which can move us to assent, but which operate in a different way. We may be impressed by the fact that Professor X believes this theory, and as we have respect for him we may find ourselves tending to believe likewise. The fact that a theory is branded in the literature as new and exciting and suggests a large number of research opportunities may move us to adopt it. Such factors can make our adoption and eventual 'belief' in a particular theoretical position personally compelling.

Likewise within theology we may ask: If we are taking part in the activity of theology, what is it here that moves us to give our assent to a particular point of view? We may point to its ability to do justice to our foundational scriptures. We may cite its consistency with views expressed in the tradition as it is developed in many parts of the world. We may point to its ability to explain points where deviation from that tradition appears to be advocated. We may cite its consonance with other beliefs that we hold in other fields. Also, as in the case of science, there will be another family of factors which also move us to belief. The person who advocates the view in question may have a particular sanctity, or be seen as having gone through the hard knocks of life and have an inherent authority to speak. The position may be a position advocated by a very charismatic and powerful personality. It may be a position exciting in its newness, and whose cracks and flaws have still to emerge.

Thus within science and theology there can be factors that invite us to give our assent by seeking to *justify* the belief, and factors that invite us to give our assent by citing factors about the belief that make assenting to it an *attractive* option, which eventually compels our heart and mind. The adoption of certain beliefs by 'authoritative persons' is one example of the second kind of factor. But in neither science nor theology is this the only factor. Within both disciplines argument, discussion and debate among individuals, groups and traditions is part of the rational process by which beliefs are shared and tested, and, sometimes, conviction is achieved.

What about practice? Science is not just a set of theories, it is a corporate and shared activity. Theology too cannot be isolated from practices that it entails – the practices of a particular religion. Thus we face the question of authority concerning practice. Here we face the family of questions, not concerning our intellectual assent in matters of belief, but questions as to who has the right to direct our activity in a particular way, in the field of either science or theology.

This question arises because the activity in each area is corporate, and individuals who share in the activity have often entered into some sort of informal contractual or covenantal relationship, with others in the field, to work collaboratively together. There has been a tradition within the western world that universities have a right to direct research. Government and industry too set up research projects, and have authority in the direction of resources. The need to have corporate loyalty within a research programme is important. So too within the field of religion: constraints governing the behaviour of adherents of that religion, their following common practices concerning baptism, worship etc., is also part of its life. The question arises as to who has the right to give direction. In both instances, 'authority' is a key notion because of the importance of the *corporate* in both scientific and religious life.

Science and religion are not matters that one pursues as an isolated individual (though an isolated individual may have great insights to contribute), but they are corporate activities where decisions concerning the norms within which they are practised need to be made, and so questions of authority regarding the direction of particular practice arise. In science there are those who set the framework for a research programme (albeit with due consultation) and there are those who agree to operate within the framework that has been set. Within religion there are those who have responsibility for continuing to shape the norms within which a religion is practised (albeit collaboratively).

Within both science and religion, however conceived, there will be that element analogous to what within political theory is referred to as '*the paradox of democracy*'. That is to say that, as a democratic individual, I do believe that the will of the majority must prevail. However, in a vote to determine what should happen I may often find myself with the minority. This means that I am both in favour of the proposal (as I favour the majority will prevailing), and I am against the proposal (as expressed in my vote against it).

So too within religion an individual can agree to operate practically within the 'orthodox' framework, but in terms of belief hold a critical attitude to it. Within science a person may agree to pursue good research within a framework that personally they would rather alter. In both there can be a healthy critical engagement between the individual and those currently holding authority. If this reaches crisis point in science a scientific project will break down, as trust and enthusiasm evaporates. If this reaches crisis point in religion a major reformation may take place.

The activity of the laboratory and the activity of the church congregation may seem initially very different, but each consists of individuals with integrity, open to conviction on matters that concern them, seeking to work together, despite real differences that may obtain. In both areas the interaction between an individual's belief (shaped in debate), and corporate practice, can be either stimulating or destructive. It is the task of those in authority, in both science and religion, to ensure that the former is the norm.

1.4 Summary

Science and religion are often perceived to be at war. We have seen that this is certainly a simplistic caricature of the complex ways in which these two areas of human endeavour have interacted historically. Elements of conflict, independence, dialogue and integration can be discerned in many episodes and in the work of many scholars. Often, lying behind the element of conflict was (and is) a supposed disagreement between the Bible and science. We have suggested that this arises because of a failure to understand that the Bible and science belong to different 'modes of discourse'. Finally, theology's appeal to the Bible or other sources of 'authority' is often seen as setting it apart radically from science; but we have seen that things are not as simple as that, there being significant parallels between the role of authority in both science and theology.