Introduction: science and religion in the West

It hardly needs stating that there are many people in the West who believe the relationship between science and religion to be one of longstanding mutual antagonism. Not only that: the fact that polls regularly confirm that formal religious—mainly Christian—observance is in decline. This, together with regular reporting of scientific advances in the multifarious spheres of its activity, can support an assumption that science is supplanting religion as a world-view in the West. This view is regularly stoked by polemical writers on both sides of this alleged divide, to the extent that, as one historian has put it, 'The secular public, if it thinks about such issues at all, knows that organised religion has always opposed scientific progress ... The religious public knows that science has taken the leading role in corroding faith' (Numbers 2009, p. 6).

However, in academic circles it has been recognized for decades that this viewpoint is seriously defective. Researchers in the field of study which has become known as ‘science-and-religion’ have pointed out, *inter alia*, that there are many sciences involving a multiplicity of practices (both compared to one another, and even within individual sciences), and also many religions involving a multiplicity of beliefs (both compared to one another, and even within individual religious traditions); so the pitting of ‘science’ against ‘religion’ clearly requires a highly selective approach to these two areas of human activity (which branch of which science? which branch of which religion?). Stemming from the work of Ian Barbour (1966, 1998), science-and-religion scholars have noted the multiplicity of ways in which science and religion can interrelate. Barbour famously noted four, which he labelled conflict, independence, dialogue and integration (Barbour 1998, p. 77ff.), and this schema has been much expanded and commented upon (cf. Drees 1998, p. 43ff.; Stenmark 2010).

Amongst the achievements of science-and-religion scholarship, we may note the following. First, conflict is by no means necessary as a means of understanding science and religion. Many commentators have urged they should be considered to be ‘independent,’ in Barbour’s term: that they constitute ‘non-overlapping magisterial,’ in a phrase coined by the naturalist Stephen Jay Gould (Gould 2001). Others have noted that Barbour’s ‘dialogue’ model offers a way in which the explorations of scientists and theologians can valuably inform the ideas of each
other (see, e.g., Polkinghorne 1995; McGrath 2016), although it has been observed that traffic in this dialogue has, to date, been significantly skewed in one direction with Christian theologians making the most effort (Southgate and Poole 2011, p. 29).

Second, it has been realized that the view which sees science and religion as in conflict requires a very selective reading of history. Two important points have been made by historians in this area. To begin with, accounts of the historical relationships between science and religion, which depict the latter as persistently obstructing the progress of the former and ultimately being vanquished by it, simply fail to do justice to the richness of that relationship. John Hedley Brooke has observed that:

The real lesson turns out to be the complexity ... Conflicts allegedly between science and religion may turn out to be between rival scientific interests, or conversely between rival theological factions. Issues of political power, social prestige, and intellectual authority have repeatedly been at stake. And the histories written by protagonists have reflected their own preoccupations.

(Brooke 1991, p. 5)

Indeed, it has been suggested that a ‘complexity thesis’ should now replace the ‘conflict thesis,’ the latter having had its day (Numbers 2010).

In addition to this, historians have also drawn attention to the etymologies of the words ‘science’ and ‘religion,’ noting that the particular nuances and resonances which they bear today are largely modern constructs, influenced by the ideas of the 18th-century Enlightenment. Peter Harrison has maintained that it is these constructs which are freighted with the idea that ‘science’ and ‘religion’ are necessarily opposed to one another. In the Middle Ages, religio signified an inner virtue, and the behaviour that followed from it: piety, we might now say, leading to justice and fairness in one’s dealings with others. Later, this understanding was transformed into the idea that a ‘religion’ is ‘a generic something typically constituted by sets of beliefs and practices’ (Harrison 2015, p. 16). Similarly, the original understanding of a scientia as an ordered body of knowledge, which might relate to any subject across what we would now think of as the sciences, arts and humanities, changed so that ‘the aggregation of a range of activities under the concept “science” took place, attended by the explicit exclusion of others—notably religion and metaphysics’ (ibid., p. 187). In short, the conflict (as it is perceived by some in the West) between science and religion is a consequence of the ways in which people are trained to view them through post-Enlightenment spectacles, rather than being something which is historically inherent in the nature of either.

A third achievement of science-and-religion scholarship has been to note that ‘science’ and ‘religion’ have most frequently been used to refer to ‘physical science’ and ‘Western Christian theology,’ respectively. In the same way that new understandings of the relationships between science and religion, and new insights into their range and subtlety, come about when considering the relationships between other sciences—say, psychology (see Watts 2017) or artificial intelligence (see Herzfeld 2000)—and religions, so different insights come about when we explore the interactions of non-Western Christianity, and of faith traditions other than Christianity, with the sciences. Such an exploration is relatively undeveloped compared to the study of the interactions of the sciences with Western Christianity, but it is already being carried out with respect to Orthodox Christianity, Judaism, Islam, and the religions of India, East Asia, and Africa. It should not surprise us that
in each of these contexts, as in the West, it quickly becomes apparent that a key factor in understanding the relationships between science and religion is their complexity.

**Science and religion in various Christian contexts**

It is fair to say that, in the Christian context, the idea that science and religion are inimical to one another has taken far more of a hold within cultures informed by Western Protestant Christianity than elsewhere. The reasons for this may be through a reluctance to engage in discussions of the matter elsewhere, or they may be practical—the platform for engagement simply isn’t there in non-Western contexts—or they may be for more ideological or theological reasons. For example, it has been maintained that in Catholic Southern Europe, which has been mindful of the damage caused to the Church by popular accounts of the ‘Galileo case’ (on this case, and on the rehabilitation of Galileo by the Roman Catholic Church, see Sharratt 1994, p. 209ff.; Finocchario 2009), ‘the default position in Catholic theology . . . has been to ignore the challenges that science could pose and to assume that theology can grow independently from any input from laboratories and research institutions’ (Oviedo and Garre 2015, pp. 175–176). In Barbour’s terms, an ‘independence’ approach has been maintained, to the extent that recent atheistic writings tend to be ‘easily dismissed as some type of local Anglo-American question, without any relevance for cultures with deep Catholic roots’ (Oviedo and Garre 2015, p. 177). Other voices from within the Catholic tradition, in countries that were formerly part of the Soviet bloc, have spoken (in the wake of the collapse of the staunchly atheist communist authorities there) on the one hand of a lively engagement between science and religion (for example in Poland: see Obolevitch 2015a), and on the other of a lack of institutional platforms for such an engagement (for example in Croatia: see Renić 2015). Distinctive voices from within the Roman Catholic Church are also contributing to a ‘relatively new but growing enterprise’ of science-and-religion studies in Latin America (Silva 2015, p. 499).

The overall differences between Eastern and Western Christian traditions are complex and have deep roots. An exploration of those roots has led to the suggestion that ‘in Western Europe an Aristotelian philosophy was absorbed by Christian thought, replacing the largely Platonist theology of the Christian East and leading to the differing attitudes to science that we see today’ (Nesteruk 2003, p. 40). This has led to the suggestion that the idea of science and religion being in conflict is essentially a Western one, having its roots in the scholastic theology of the 13th century (see Mitrikeski 2015). Confirmation of this would appear to be offered by the fact that the ‘Galileo case’ was not seen as significant by the Russian and Greek Orthodox Churches (Obolevitch 2015b). Nesteruk suggests that in contrast to the West, where science and theology both appeal to reason, Eastern theology is more experiential (involving both personal and collective experiences of God, for example in worship), and that for a true dialogue between science and theology to occur, science should be seen to be similar about a kind of existential (religious) engagement. He comments: ‘Any tension between theology and science then disappears, for they both flourish from the same human experience of existence-communion’ (Nesteruk 2003, p. 7).

It is also significant that Eastern Christian theology lays great emphasis on tradition, and so is rather more bound up with the thinking of the early Church Fathers than is the case in the West. Whilst this might be considered to offer limited potential for engagement with contemporary scientific ideas, since those ideas have been formed within a worldview so radically different from that of the patristic period, it has been suggested that Eastern thinking offers a theological resource which may be of value to the dialogue of science and
Christianity—even that there is a ‘continuing relevance of Eastern patristic perspectives, which . . . provide answers to many of the questions’ raised by science-and-religion scholars in the West (Knight 2007, p. xii). This may not be as far-fetched as it appears: a number of Western theologians have drawn on patristic ideas when commenting on contemporary issues in science and religion (see, e.g., Peacocke 1993, p. 338ff.; Hart 2009).

Science and religion in Judaism

The historical and geographical variation noted in the relationship of Christianity to the sciences may be discerned also in Jewish understandings of the relationship between science and faith. This is hardly surprising since, for much of its history, Judaism has been practised within ‘host’ cultures, and has inevitably been influenced by the history and practices of those cultures (Samuelson 2015). Where the sciences are concerned, it has been noted that:

There has been no single, enduring Jewish attitude toward nature and its study . . . Jews have been at times apathetic about what they sometimes called ‘natural wisdom,’ at times opposed to its study, and at times its vanguard. This is no surprise. When looked at over the span of millennia, Judaism has very few constants.

(Efron 2011, p. 20)

The fact that many notable scientists over the last few centuries have hailed from Jewish backgrounds has been much commented upon. It has been suggested that this might be, at least in part, a combination of an upbringing which encourages a questioning of authority, combined with the fact that the practice of science has offered a welcome to people from socially marginalized communities (Cantor 2011). It has been noted that an issue such as evolution, which has caused some Christians (and some Muslims) to see a conflict between science and their faith, has been far less problematic for Jews, and this has been put down to ‘a robust dialectical tradition of nonliteral interpretations of Torah’ (Cantor 2011, p. 53) (though for an example of an early Jewish opponent of evolutionary theory, see Langton 2015).

However, it has also been maintained that there is currently a deficit in interaction of Jewish philosophy and the sciences (with the exception of medicine, in which context Jewish commentators have been as interested as those of other religious communities in developments in bioethics). To counteract this, Samuelson has urged that Jews should ‘establish programs of study on the interaction in every way—historically, conceptually and ethically—between the modern sciences as well as modernist and traditionalist forms of Jewish identity’ (Samuelson 2009, p. 237).

Science and religion in Islam

Similar complexity is found in the relationship between science and Islam. It has often been pointed out that science, in the modern sense, flourished in the Islamic world rather earlier than in Western Europe, with Islamic scholars of the ‘golden age’ making particular contributions to the study of astronomy, mathematics, and medicine (see Dallal 2011, p. 125ff.). However, the antagonism being advanced towards religion in the West in the late 19th century was directed not just at Christianity but also at Islam. In what has been described as a ‘watershed event for the position of science in Islam,’ the French scholar Ernest Renan declared in 1883 that ‘Muslim societies had their previous successes in the
fields of science and philosophy not because of Islamic religion but despite Islam.’ Renan claimed that ‘as European science spread, Islam would perish’ (İhsanoğlu 2011, p. 163). This might perhaps be seen as an example of the Western ‘conflict thesis’ being rolled out to encompass religions more generally. However, it has had the unfortunate effect of facilitating an assumption that modern science is necessarily a Western practice, which as such is un-Islamic. In more recent times, there have been a variety of responses within Islam to this assumption.

On the one hand, there have been calls for the instantiation of an ‘Islamic science.’ It has been suggested that this would counter Western presuppositions by (for example) rejecting scientism as essential to the practice of science, and studying traditional Islamic sources (including those relating to the ‘golden age’ of Islamic science), in order thereby to formulate an Islamic worldview which is true to that tradition whilst also being consonant with modern discoveries in the natural world (see Nasr 2015).

More contentious is the response within Islam to contemporary scientific ideas, which sees them as prefigured in the Qur’an, thereby confirming the divine origin of that text. This approach, known as i’jaz, is also sometimes extended to the hadith (the sayings of the Prophet). It is a very popular approach, with antecedents dating back some 150 years, which neatly harmonizes science and Islam by seeing the former as, effectively, foretold by the sacred text of the latter. However, this approach has been labelled ‘pseudoscientific,’ and it has been maintained that:

> [o]n the one hand, the producers of such a line of interpretation (usually lacking formal theological training) express a genuine and, from a confessional viewpoint, laudable desire to harmonize religion and science. On the other hand, their efforts present major methodological flaws as well as blatant mistakes and have accordingly been criticised.  
> (Bigliardi 2017, p. 147)

There are also understandings within Islam which have parallels with those Western religious movements which see science as threatening to faith. Thus, although it has been maintained that ‘there is no unified Islamic position on evolution. This is all the more to be expected in the absence of a clear position expressed by the Qur’an’ (Hahmeed 2010, p. 139), there is an anti-evolution movement within Islam paralleling that within ‘creationist’ forms of Western Protestant Christianity. A form of Islamic creationism has been widely popularized by an organization run by Harun Yahya, and influential scholars such as Seyyed Hossein Nasr and Muzaffar Iqbal have espoused anti-evolutionary positions (ibid., pp. 139–141). Moreover, opinion polls in a number of Islamic countries indicate that ‘the vast majority of adult Muslims do not accept the theory of biological evolution’ (ibid., p. 144). Interestingly, it would appear that Western anti-evolutionary thought has been feeding its Islamic counterparts (Guessoum 2011, p. 316).

In addition to these varied perspectives, some Muslim scholars have approached the interaction of science and religion as scientific practitioners, in the Western sense. Basil Altaie, a physicist, has drawn on the scholastic Kalam tradition within Islam to explore issues which have been discussed by Western science-and-religion scholars, such as the concept of a law of nature and the possibility (or otherwise) of divine action in the world (Altaie 2010, 2016). Another physicist, Nidhal Guessoum, has developed a systematic approach to science-and-religion analogous to that of Barbour and his successors in the West, exploring the same kinds of topics (the history of science and of Islam, epistemology, cosmology) and
advocating a similarly irenic position—whilst noting the current tensions within Islam over issues such as evolution (Guessoum 2011, 2015).

Science and religion beyond the monotheistic traditions

Religious traditions in India, East Asia, and Africa developed their own approaches to the study of the natural world. Some have been imported into the modern West, for example Chinese medicine. In general, there does not appear to be any history of these sciences systematically clashing with religion. For the purposes of this survey, we will set to one side these historical relations between non-Western approaches to studying the natural world and religious traditions and focus on the modern interactions of those traditions with Western science (but see e.g., Menon 2015, p. 12ff.; Jaeshik 2016, pp. 206–212; Kuang-Tai 2016, pp. 90–94).

Compared to the amount of literature generated by the interaction of science and religion within the Christian and, increasingly, Islamic traditions, there has been relatively little relating to modern science and the religions of India, East Asia, and Africa. This is undoubtedly in large part due to those religions framing the world and the place occupied within it by humankind rather differently from the monotheistic cultures. Moreover, just as we have noted that there are a multiplicity of responses to challenges posed by science within the individual religious traditions discussed thus far, we might expect any responses to Western science from these non-monotheistic religious traditions to be similarly (or, indeed, more) multifaceted, depending not only on the antecedents of those traditions but also on their regional and local manifestations—as well as on the nuances brought into those responses through Western science impacting on such traditions through colonial or missionary activity (or both).

The philosophical context in which the encounter of science and such religions takes place is frequently very different from that of the West. Looking at the Chinese context, Shin Jaeshik summarizes this well:

When we explore the religion-science issue from an East Asian approach, three aspects need to be mentioned. First of all, the East Asian nondualistic way of thinking is different from that of the West, and thus we perceive the religion-science issue differently. Second, East Asians have a different historical experience of religion and science. The Chinese terms [for ‘religion’ and ‘science’] are new to East Asians because they were coined and introduced during the second half of the nineteenth century in the process of translating Western literature. Third, for East Asians ‘actual practice’ is more important than ‘theoretical knowledge.’ We might say that we believe that truth is realized not through orthodoxy but through orthopraxis. This tendency suggests that the issue of religion and science transcends the intellectual dimension, embracing practical and communal dimensions.

(Jaeshik 2016, pp. 205–206)

(There is perhaps here a resonance with the Eastern Orthodox Christian approach described above by Nesteruk.) Similarly, Hsu Kuang-Tai notes that ‘In contrast to Western science, which developed within the naturalistic [reductionistic] thinking of Western civilization, Chinese science developed by the associative or correlative thinking of Chinese civilization’ (Kuang-Tai 2016, p. 90). Kuang-Tai also draws attention to the crucial importance of the notion of qi in all aspects of Chinese culture. The term defies translation into English:
Kuang-Tai writes, ‘According to qi, everything, including heaven, the earth, the myriad of things, human beings, and so on is composed of qi, which moves everywhere in the cosmos’ (Kuang-Tai 2016, p. 92). Interestingly, this all-embracing concept means that there is a close relationship between concepts which are seen as sharply distinct in the West, such as politics, ethics, and the study of nature. The Korean scholar Jaeho Jang has explored this further, suggesting that the concept of qi may have resonances with the Western idea of information, as expounded in the evolutionary theology of John Haught. He notes that ‘in East Asian thought science and religion are not divided clearly, and are not on terms of conflict’ (Jang 2017, p. 305).

Some have gone further and suggested that there are clear resonances between contemporary scientific ideas and traditional Eastern ways of thinking. Whilst the enthusiasm expressed by Fritjof Capra in ‘The Tao of Physics’ (‘the two foundations of 20th century physics—quantum theory and relativity theory—both force us to see the world very much in the way a Hindu, Buddhist or Taoist sees it’ (Capra 1999, p. 18)) has been much critiqued (see, e.g., Brooke and Cantor 1998, p. 75ff.), it is certainly the case that within a tradition like Buddhism there is (at least in some quarters) an openness to scientific ideas and a willingness to incorporate them into the tradition (see Barua 2017, p. 128ff.). However, there have also been warnings that the perceived compatibility of science and Buddhism comes at a cost to the latter (see Lopez 2008, p. xiii).

Writing from a Japanese context, Seung Chul Kim notes the problems associated with translating Western understandings of concepts like ‘God’ and ‘religion’ into that context. He suggests that the relationship between science and religion may usefully be seen ‘not in the form “science-God-religion,” as it has been overwhelmingly framed up until now, but under the title of “science-śūnyatā-religion,” and “science-kokoro-religion”’ (Kim 2015, p 170), where śūnyatā and kokoro are concepts (signifying emptiness/indifference and mind/heart/spirit/will, respectively) which might act as bridges between science and religion, as these terms are understood in the West.

In the Indian religious traditions, again, the notion that science and religion should be seen as in any sense opposite to one another is by no means immediately apparent. It has been suggested that three factors lie behind this: a radically pluralistic attitude, a history of rigorous interchange between those of different religious and philosophical traditions, and a view which sees both science and religion as expressions of a ‘lower’ form of knowledge, to be contrasted with a ‘higher’ form which ‘entails a direct, nondiscursive mode of knowing’ (Balslev 2015, p. 882). In a valuable survey of the literature regarding the encounter of science and Hinduism, Dorman draws attention to:

[the sheer impossibility of fitting Hinduism into the religion side of science and religion without taking significant nuances into consideration, notably that what the West would break up into science, philosophy and religion all blend together under many versions of Hinduism.

(Dorman 2011, p. 614, italics in original)

He notes, too, the predominance of the Vedanta tradition in thinking about science and religion in the Indian context, noting however that it is the intellectual tradition of the high caste, which should not be considered representative of the Indian population nor of Hinduism in general (though its popularity expanded in the modern period with various forms of neo-Vedantic thought, such as that of Vivekananda).
Exploration of the interactions of science with indigenous African religions is in its infancy, but we may note here the studies of Feierman and Janzen (2011) regarding the integration of medicine and religion in traditional contexts and the separation of the two with the introduction of Western (and Islamic) ideas during the colonial period, and of Conradie and du Toit (2015), concerning the interaction of Western science and indigenous knowledge systems in South Africa during and after apartheid. Such studies add still greater richness to the emerging picture of the complex global interactions of the sciences with religious traditions.

Conclusion

The perception that science and religion are of necessity in conflict with one another is strongest in Western and monotheistic cultures, and is based on particular constructions of ‘science’ and ‘religion’ which came to prominence in the 19th century. The particular philosophical underpinning of science which is required to sustain this view—a rigorously materialist metaphysic, which has been labelled ‘naturalism’ or ‘scientism’—has been much commented upon (see Plantinga 2011), and it has frequently been pointed out that such a metaphysic is by no means a necessary requirement for the practice of Western science. It would appear that the extent to which science and religion are more widely perceived as inimical outside the West depends on whether or not Western scientistic presuppositions are imported into non-Western contexts.

In general, the Western, modernist construction which sees ‘science’ and ‘religion’ as inevitably and irretrievably locked in conflict cannot be sustained when considering religion in global societies. David Livingstone has suggested that, when looking at particular instances of science-religion interaction, it is helpful to bear in mind four imperatives: ‘pluralize, localize, hybridize, politicize’ (Livingstone 2011, p. 282). In other words, the interrelation of ‘science’ and ‘religion’ is more helpfully thought of in terms of ‘sciences’ and ‘religions’: it is highly contingent on geographical setting: it is bound up with changing perceptions of both science and religion; and it is freighted with political concerns relating to both the time and the place of the interaction. It would appear that the idea of a conflict between science and religion can only be sustained by those taking particular, confrontational views of how these ideas are understood, within the Western tradition; and even within that Western tradition, many see no need for the conflict.

Future science-and-religion research, particularly regarding non-Western religious traditions, will doubtless lead to further refinement and correction of the views outlined here, enabling an increasingly more nuanced understanding of the relationships of those traditions with the sciences. Additionally, it is to be hoped that an increasing awareness of the richness of the possible interactions between the sciences and religious traditions will lead to more and more exploration of how each might fruitfully inform the thinking and the practices of the other, reversing the antagonistic, isolationist stances of some contemporary Western commentators.

References


