CHAPTER 1

Introduction

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John Hedley Brooke is well known to students of science and religion as the slayer of the 'conflict thesis' – the hackneyed but popular idea that, ever since the Scientific Revolution, 'science' and 'religion' have been locked in a deadly battle in which science emerges triumphant. In his *Science and religion: Some historical perspectives* (1991) and other writings, Brooke has used historical scholarship to show how wrong this picture is.[1]

The systematic dismantling of received ideas about the nature of the scientific enterprise was one of the starting points for this reappraisal of scientific and religious relations. In the 1950s and 1960s historians and philosophers of science began to criticize the 'Whig' view of history, according to which science in the past should be seen as slowly but surely approaching the truths put forward by science in the present.[2] The new anti-Whig conception of science underpinned Thomas Kuhn's *The structure of scientific revolutions*, first published in 1962, which helped set the agenda for future generations of scholars. In Kuhn's picture, the history of science was a discontinuous series of traditions or paradigms dedicated to solving particular puzzles with greater empirical accuracy, but not necessarily approaching some unseen objective reality in the process.[3] This shift in the history of science also inaugurated a new ideal of the historian of science as an observer of the science of past ages, rather than an advocate for modern science. In other words post-Kuhnian historians of science have tried to approach past science on its own terms and not as a curious but unsuccessful attempt to deliver the scientific truths of the present.

Histories of the relationship between science and religion written in this spirit started to appear in the 1970s. This new history of science and religion would replace over-simple master-narratives with a richer sense of the complexity of past engagements between science and religion; it would place those intellectual engagements firmly in their proper social and political contexts; and it would undermine the very idea that 'science' or 'religion' could be reified as entities with timeless essences.[4] Brooke by

no means achieved the ascendancy of this new historiography single-handedly.[5] However, his *Science and religion* and his 1998 book with Geoffrey Cantor based on their Gifford Lectures, *Reconstructing nature: The engagement of science and religion*, have been particularly influential.[6] The present volume offers an opportunity for a group of scholars actively developing new historical perspectives on the history of science and religion to take stock of Brooke's landmark contributions to the field and also to map out the new directions being taken by historians of science and religion almost two decades after the publication of Brooke's classic study. In the rest of this introduction I engage briefly with each of these tasks, highlighting what I take to be the most important themes that run through the contributions to this volume and sketching out the agenda for future research that they collectively suggest.

JOHN BROOKE AND THE HISTORIOGRAPHY OF SCIENCE AND RELIGION

Noah Efron's chapter includes a vivid account of the impact that Brooke's 1991 book had on him personally as a young historian at the start of his career. Efron was certainly not alone in finding himself forced by Brooke's work to rethink his assumptions about the history of science. But, as any reader of Brooke will know, 'forced' is not quite the right word. The persuasive effect of Brooke's writings arises from a very subtle combination of factors: sophisticated and sympathetic readings of published and unpublished historical documents, a palpable delight in the richness and intricacy of the intellectual histories he unfolds, and a rhetorical style which manages to convey caution and modesty at the same time as a certain steely resolve.

These techniques were deployed by Brooke in the pioneering course materials he developed for the Open University in the 1970s and subsequently in his studies not only of European natural theology and of the religious commitments of notable English men of science, including Isaac Newton, Joseph Priestley, William Whewell, Robert Owen, and Charles Darwin, but also in a series of studies on the history of chemistry, and in his work in editing and contributing to many collections of essays, including recent volumes on *Heterodoxy in early modern science and religion* (2005), *Religious values and the rise of science in Europe* (2005), and *Science and religion around the world* (2010).[7] Brooke's writings are marked not only by elegance and erudition but also by a fondness for nuance and even occasional wordplay. Brooke suggests, for example, when

writing of Priestley's utilitarian interest in science that 'it was through salt that he came to Bacon'.[8] He writes of the difficulties that confronted the mathematician Mary Somerville in her bid to become 'a queen of the sciences'.[9] And Charles Darwin, Brooke concludes, cannot be easily pigeon-holed at the various stages of his intellectual development: 'On reflection it would be surprising if the man who showed us that we cannot pigeon-hole pigeons could be pigeon-holed himself'.[10]

There is more to this last remark, though, than mere wordplay. The refusal to pigeon-hole is central to Brooke's project. He has repeatedly emphasized the complexity of individuals and their intellectual commitments and warned us of the distortions involved in lumping them together. He particularly cautions historians against trying to group people or ideas into pigeon-holes labelled 'science' or 'religion', or historiographical ones labelled 'conflict' or 'harmony'. Brooke famously wrote in his 1991 book: 'Serious scholarship in the history of science has revealed so extraordinarily rich and complex a relationship between science and religion in the past that general theses are difficult to sustain. The real lesson turns out to be the complexity'. And again: 'Much of the writing on science and religion has been structured by a preoccupation either with conflict or with harmony. It is necessary to transcend these constraints if the interaction, in all its richness and fascination, is to be appreciated'.[11]

Some might wonder whether in the midst of all this richness and fascination, however, any historical generalizations can be sustained at all. It sometimes seems not. One reviewer of Brooke's *Science and religion* described it as 'a very cautious book, a detailed, nuanced description of complexity and diversity that lacks an argument of its own'. That reviewer went on to say that, in his view, the 'almost astonishing balance' on display was a sign of 'historiographical maturity rather than lack of nerve'.[12] Brooke himself has been aware of the danger of over-complexification as an issue in the history of science. In his Presidential Address to the British Society for the History of Science in Leeds in 1997, speaking about whether the history of science was a unified field with a unified subject matter, Brooke asked his fellow historians of science: 'if we stress the permeability of the boundaries with which the word "science" has been ringed, does the subject not simply dissolve into fragments of socio-cultural history?' Such a prospect, Brooke admitted, would worry many. 'But if *the* history of science has no future', he went on, 'histories of different sciences in their different local contexts surely still have a bright one. As scholars in the field we can map the multiple spaces in which the sciences have taken shape and we can relish the differentiation'.[13]

That final phrase could serve very well as a motto to encapsulate Brooke's approach to history: 'Relish the differentiation'.

In that same talk Brooke spoke of the 'dissonance between simple narrative forms that have proven public appeal and the complexities disclosed by serious scholarship'.[14] This moves us from the dangers of reifying the categories 'science' and 'religion' to the harm that can be done by misleading historical master-narratives. Brooke's own solution to the problem of how to popularize the history of science without falling prey to misleadingly simplistic narratives, in his 1991 book, was to use the simplistic narrative as a foil for his own more complex and scholarly account. The wrongness of the conflict narrative motivated Brooke's whole book. A comparable historiographical ploy can be found in Jim Endersby's 2007 book, *A guinea-pig's history of biology*.[15] The historiographical villain for Endersby is the narrative of the lone scientific genius. As one reviewer put it, Endersby 'explodes the persistent myth that science is a series of eureka moments by heroic individuals, instead revealing a complex reality of social interaction and interdependence'.[16]

Drawing attention to this relationship between simplistic popular narratives and academic complexification, Richard Olson has written: 'There is a serious question about whether the forceful presentation of simple master narratives precludes or is a necessary prerequisite to more subtle investigation. Brooke seems to assume the former; I am inclined to believe the latter'.[17] Olson is right that the craft and rhetoric of the academic historian frequently makes use of a contrast between scholarly rigour on the one hand, and sweeping generalizations, overly simple narratives, popular misconceptions, and one-sided explanations on the other. But, as Olson implies, such complexification cannot be an end in itself. The success of Brooke's work should not mean that conflicts or generalizations are forever banned from the historiography of science and religion. The traces left by past individuals and societies impose upon the historian neither clear narratives, nor self-evident categories. But neither are they entirely without pattern. Several chapters in this volume, especially those by Peter Harrison, Geoffrey Cantor, and Ronald Numbers, directly address this question of how to find legitimate places for both conflict and generalization in a post-Brookean historiography.

I have discussed two of the most salient points of the new historiography of science and religion: its aversions to reification and to master-narratives. A third important feature is the idea that this new approach to the subject is less partisan than what went before. Brooke and Cantor have written of their desire to approach their subject as an 'impartial observer' would.

Historians, on this view, should 'strive not to be partisan but instead should seek to understand all the protagonists and the historical nexus in which they operated'.[18] Likewise, in their introduction to *When science and Christianity meet* (2003), David Lindberg and Ronald Numbers write that recent historians of science and religion have 'laid aside apologetic and polemical goals, choosing to understand rather than to judge'.[19]

These are very admirable historiographical principles, but they are not immune from scrutiny themselves. Historians of science are trained to raise a sceptical eyebrow at claims to be able to produce value-free knowledge. And no historian of religion will readily accept the notion that a history of religious thought might be composed that was entirely innocent of apologetic intentions. Future generations of historians will wish to historicize and question the 'impartial' and 'non-judgemental' histories of science and religion produced since the 1970s, just as the contributors to the present volume have used the tools of historical analysis to unearth the genesis of those master-narratives against which recent historians have been reacting. We should never stop asking whose interests a particular historical narrative serves and for what purposes it has been constructed. And we should not exempt our own narratives from those searching questions.

HISTORICIZING NARRATIVES AND CATEGORIES

Our histories themselves have histories, as several of the chapters in this volume illustrate. The idea that there was a 'Scientific Revolution' between 1500 and 1700 and that this marked a definitive moment of separation between science and religion was, as Margaret Osler shows, the creation of nineteenth-century positivists and twentieth-century historians, who read their own secularist aspirations and experiences back into the history of the sciences during a period when they were, in fact, pursued in a climate of diverse, serious, and vibrant theological concern. Frank Turner, who was one of the historiographical pioneers in this field thirty years ago, offers a comprehensive unpacking of the 'conflict narrative' with reference to its origins in the intellectual and cultural world of the late nineteenth century. Turner reminds us that we should not discount the existence of real conflicts between science and religion in that period as one of the reasons that such an historical narrative would emerge. But the fact that a strong public sense of a conflict between science and religion emerged when it did still itself needs to be explained. Particularly important here is an appreciation of the history of religious

life and thought during the nineteenth century, and of the emergence of a new sphere of state education, over which different interest groups could tussle. Turner thus provides a definitive study of the intellectual and social milieu into which the infamous 'conflict thesis' was born.

Cantor's chapter reinforces Turner's argument about the origins of the 'conflict thesis' in the 1870s and makes the very interesting further observation that John W. Draper seemed to be predisposed to see history in almost Manichean terms as a preordained conflict between opposing forces. Shortly before composing his notorious *History of the conflict between religion and science* (1875), Draper had completed a history of the American Civil War which was organized around the central narrative of an inevitable conflict between two essentially opposed ideologies – in this case freedom *versus* slavery, rather than science *versus* religion. It makes one wonder whether individual psychology as well as social history needs to be employed in an explanation of the origins of our ideas of a conflict between science and religion.

Chapters by Harun Küçük and Salman Hameed put famous historical narratives of conflict between science and Christianity in a different light by looking at the role given to Islam within such works. Küçük points out that both Draper and Andrew Dickson White, author of *A history of the warfare of science with theology in Christendom* (1896), made polemical use of the history of Islamic science in their works. In both cases a narrative of harmony between Islam and science was used as a foil for the main narrative, according to which either Christian theology in general or Roman Catholicism in particular was to be held responsible for an outrageous antipathy to scientific progress. Hameed also notes that Draper congratulated Muslim thinkers for having originated the idea of organic evolution centuries before Darwin. Thus a narrative of conflict between science and one religious tradition can simultaneously be reinforced by a story of harmony with another.

Understanding the provenance of dominant historical narratives is an important step, but only the first step, towards a fuller historicizing of our contemporary thoughts about 'science and religion'. The next step is to examine the histories and meanings of the very terms 'science' and 'religion' themselves. If, for instance, Draper and White alleged that Islam, unlike Christianity, had historically been hospitable to scientific endeavours, then that implies that, at the very least, we need to specify which religion we have in mind when we speak of the relationship between 'religion' and science. However, as Peter Harrison demonstrates in his chapter, what is in fact required is a deeper questioning of these

categories. The idea that Christianity and Islam are both members of the generic category 'religion' is itself a product of the nineteenth-century development of the sciences of religion, which Harrison and Küçük both explore. And the category of 'science', as any student of the subject knows, has certainly not had a stable meaning over the centuries. Nor can we easily exchange our 'science' for an earlier category of 'natural philosophy'. Harrison reproduces a telling quotation from John Locke who, while explaining the difference between empirical investigations and more certain knowledge, wrote that he suspected 'natural philosophy is not capable of being made a science'.[20] It is debatable when modern 'science' as we now understand it emerged, but the question of the continuity or lack of it between attempts to comprehend nature in earlier periods and the activities of scientists today has profound implications for any research into the history of 'science', including the question of its relationships with whatever we might mean by 'religion'.

What might we mean by 'religion'? One of the recurring questions below, which emerges not only in Harrison's chapter but also in those by Jan Golinski and Jonathan Topham, is whether 'religion' refers to something cognitive or to something practical; to beliefs or to practices. Harrison sympathizes with the view of Wilfred Cantwell Smith that 'religion' has come, partly through the influence of the sciences, to be taken as a term for a set of intellectual beliefs expressed as propositions.[21] What began as a reduction of Christianity to a set of beliefs was then generalized to include all non-Christian faiths in this same propositional category of 'religions'. This tended to obscure the fact that religious traditions include elements of practical piety, inward spirituality, social organization, and much else beyond the purely intellectual. It also made for easy comparisons with scientific theories, which were also expressible in propositional form. Yet this strategy usually worked to the detriment of religion.

How, then, might historians recover a proper sense of the practical as opposed to the propositional nature of religion? Jan Golinski approaches this question through the work of the anthropologist and sociologist of science Bruno Latour, whose analysis of religion as a 'performative' realm is less well known than his theories about the practices of science. Golinski explores the implications for discussions of science and religion of adopting such a non-propositional view. Topham, in summarizing the key contributions that historians of the book and of publishing have made to the field, likewise suggests that a shift in historical focus from beliefs to practices is an important recent trend. All of this amounts to a powerful

case for rethinking our categories along less propositional, less cognitive lines. Histories of experimenting and writing, preaching and worshipping, publishing, and reading can offer historical insights to complement histories that have focussed on the cognitive dimensions.[22]

These recent reappraisals of the categories of 'science' and 'religion' have shared a basic philosophical outlook with what went before. The historiography of science and religion articulated by Brooke, Cantor, Lindberg, Numbers, and many others has always been nominalist rather than realist in tone. To put it another way, the new historians of science and religion from the 1970s onwards were always opposed to the reification of categories of thought. But nominalism about our categories can be pushed to uncomfortable extremes. Any category at all can be profitably historicized. The various and unexpected semantic shifts through which a category has passed may well give us good reason to pause before using it ourselves.[23] We might ask, however, whether there are special reasons for ultra-nominalism in the cases of 'science' or 'religion'. Are these terms any more problematic than, say, 'nature' or 'God'? Historical awareness about our categories is absolutely essential, but we shall sadly never be able to lay our hands on any unproblematic alternative categories which somehow transcend history. And it is for this reason that books about 'science and religion' routinely, simultaneously, and unavoidably both use and problematize those central categories.

THE POLITICS OF KNOWLEDGE

Recognizing that science and religion involve worldly practices as well as intellectual beliefs encourages us to become aware of the political dimension. If the main strategies involved in Brooke's own overturning of the conflict narrative were complexification and contextualization, for other scholars the same end has been pursued through politicization. As I have already implied, historians of science and religion have learned to ask whose interests are served by the promotion of particular scientific or religious ideas, and the same question can be asked about historical narratives themselves. In other words, the tools of social and political history can be used to look for the power struggles that motivated intellectual disputes.

The chapters below reveal that the power struggles that give motive and meaning to engagements between science and religion can be global or local in scale. Osler and Turner both identify large-scale social shifts in European history that can explain conflicts between natural knowledge

and religious teachings. Osler points out that socio-political factors, including urbanization, were responsible for the decline in the influence of religion in modern Europe. This was just as important a factor as intellectual disputes about the compatibility of the new sciences with Christian teaching. In the same vein, Osler notes that the new seriousness with which historians of science have recently engaged with early modern religion and theology must also tell us something about the politics of the late twentieth and early twenty-first centuries.

Looking beyond Europe, the struggles involved are no longer always between interest groups within the borders of one society but rather involve the added dimension of encounters between the colonizers and the colonized. Sujit Sivasundaram's chapter, focussing on the impact of the British empire in Africa, Asia, and the Pacific, shows that to reject or accept European science in the nineteenth century could simultaneously be a way to resist or to be assimilated by a colonizing power (and by their religion). For example, Sivasundaram recounts the story of Nan Inta, who was converted simultaneously to Christianity and to western science by a correct astronomical prediction. Hameed's chapter reveals that colonial dynamics have persisted in the Islamic world up to the present day. Evolutionary science has been accepted by some Muslims as a mark of modernity and as an intellectual development in harmony with their faith and prefigured in the Qu'ran, while being rejected by others as an oppressive, corrupting, and illegitimate western influence. Hameed further points out that Muslim engagements with evolutionary science have varied in line with the different political contexts to be found in Islamic countries, whether secular or theocratic, monarchical or republican, democratic or elitist.

To recognize the importance of pre-existing political contexts is one way to politicize the relationship between science and religion. A more direct politicization treats science and religion as forms of power themselves. And it is in the histories of education and publishing, innocuous as such subjects might initially sound, that we find the history of the raw exercise of power in the production and reproduction of knowledge. If knowledge is power, in other words, then those who control the dissemination of knowledge are those who wield the real power. This highlights the importance of Turner's observation, mentioned above, that the story of an historical conflict between science and religion was produced by those engaged in a struggle for dominance in the newly created domain of state education in the nineteenth century. The chapters by Adam Shapiro and Bronislaw Szerszynski reinforce this point in twentieth-century contexts,

with reference to the famous 1925 Scopes trial and to more recent developments in debates about the content of science education. These chapters show that the conflict between evolutionists and creationists is a struggle to control the apparatus of state education. Shapiro sheds fascinating new light on the Scopes case by unearthing evidence of the local political skirmishes in the town of Dayton, Tennessee, that led up to the infamous 'Monkey Trial'. Szerszynski's chapter contrasts modern European and American educational systems and, using recent sociological research, suggests that religious education is just as important as scientific education in shaping popular attitudes to evolutionary science and to creationism.

To control the production and dissemination of the tracts, treatises, books, and periodicals through which ideas are spread is, in addition to deciding what should be included in school syllabuses, another way to exercise this sort of power. Historians of publishing, who are interested in this process of dissemination, are able to suggest answers to absolutely fundamental questions about how people come to have ideas about science and religion in the first place. The answer, very often, has been through reading books and periodicals made available to them by a trusted individual or an authoritative institution. The distribution of ideas in books and periodicals gives a certain amount of influence to individual authors, and the history of science and religion has, up until now, been overwhelmingly a history of authors. But historians are now turning their attention to publishers and readers as well as authors in order to fill out our understanding of the processes involved.[24] The chapters by Shapiro, Sivasundaram, and Topham all illustrate the great importance of recognizing that it is in the history of publication and reading, as well as in literary and intellectual history, that we find the means of production of those rather abstract-sounding 'relationships between science and religion' with which we are concerned.

ISLAM, CHRISTIANITY, AND EVOLUTION

As is clear from the preceding comments, understanding the politics of knowledge often entails also studying the geography of knowledge.[25] Ideas and practices do not travel around the world in disembodied form but are taken to particular places in particular forms by particular people. Much of the pioneering work in the history of science and religion focussed on the ways that ideas about Christianity and its engagement with such sciences as astronomy, geology, and evolutionary biology had developed