I am grateful to my interlocutors for their careful reading of the book and their incisive remarks. Thanks also to the editors of Metascience for this opportunity to offer a brief response. Necessarily, I am unable to respond to everything the commentators have raised and instead will address four major concerns which to varying degrees appear in each of the three commentaries.

1. **Christianity and Propositional Religion.**

One of the key arguments of the book is that the modern understanding of the relationship between science and religion requires a careful investigation of the origins of the concepts themselves. In relation to ‘religion’, my argument was that our modern idea of plural religions characterised by sets of beliefs and practices is an idea that appears for the first time in the early modern period. All three of my reviewers have expressed various levels of doubt about this claim, pointing variously to the importance of creedal statements for the early church, to the vigour with which heresy (false belief) was pursued in the middle ages, and to the fact that the pre-modern relations between Christianity and Judaism (and possibly Islam) already look
like the kinds of relationships between competing religions that on my account emerged only in the modern period.

John Heilbron counters my suggestion about the non-propositional essence of Christianity by alluding to the principle *extra ecclesiam nulla salus* (no salvation outside the Church) and by pointing to examples of how in late antiquity and the middle ages the Church seemed preoccupied with creeds and the exclusion of heretics. But the maxim *extra ecclesiam nulla salus* actually serves to exemplify the general thesis that I am proposing. Salvation was the business of Christianity, and it was made available through membership of the Church and participation in its sacraments. There is no reference in the formula to beliefs or to anything called the Christian religion. In the middle ages, membership of the Church was made possible through the sacrament of baptism, typically conferred upon infants unlikely to be offering explicit assent to the doctrines of the Church. The relevant terms point to this. *Christianizare* (to Christianize) referred to baptism, not profession of belief. Similarly, for adults in this period, *catechismus* denoted not the learning of dogmas, but a process of initiation into Christian rites and mysteries (Ristuccia 2013, 17-18, 41-44). This is why Jean Delumeau could suggest that Europe really only became ‘Christian’—in the sense of a widespread inculcation of explicit Christian beliefs among the general populace—following the Protestant and Catholic Reformations (Delumeau 1977: Harrison 2015, 94). For the vast majority of Christians in the middle ages what was required was faith in a Godhead and *implicit* faith (or trust) that the Councils of the Church had a correct theoretical grasp of the person and work of Christ.

Stephen Gaukroger shares John Heilbron’s view that medieval Christianity was understood primarily in doctrinal terms: “religion did come to be construed in doctrinal terms by Christian theologians”. He goes on to say that Christian theologians treated “all religious differences in terms of differences in doctrine”. For Gaukroger this is exemplified by the fact that Islam and Judaism were regarded as heresies. I do think that pre-modern relations among Christians, Jews and Muslims in some ways look like subsequent relations among religions and there is more work to be done here. But it should be stressed that Jews and Muslims were not regarded as heretics, since heresy was “a corruption of Christian faith”: that is to say, the category of heresy is internal to Christianity (Thomas Aquinas, *Summa theologiae*, 2a2ae. 11. 2). Admittedly, on the face of it, heresy looks like a prime instance of privileging propositions and heresy hunting would seem to indicate that a premium is placed upon correct belief. Again, though, it is important to understand that the culpability of heresy lay in the fact that it arose out of the vice of pride (and the subsidiary vices of curiosity and obstinacy). The underlying problem was moral, rather than cognitive. For this reason, Aquinas treats heresy in his discussion of the theological virtues and their corresponding vices. Heresy caused harm to individuals by being injurious to the virtue of faith and by separating the person from God. Heresy was also damaging to the community because of its potential to promote schism. In relation to the theological virtues, then, heresy was opposed to faith, and schism was opposed to charity (Aquinas, *Summa theologiae*, 2a 2ae 10, 1; 39, 1). The point is here that
heresies might be defined in doctrinal terms but they are not understood ‘in purely
doctrinal terms’. Rather, false doctrinal beliefs are the visible symptoms of heresy
and the means through which it could be detected. None of this is to deny that
important conciliar statements were indeed expressed in creeds and propositions, or
that patristic Christianity was more propositional than competing systems of thought
and ways of life. But Christianity was not understood as a religion constituted by its
propositional components. That would only come in the modern period, when
internal divisions within Christianity are characterised in terms of beliefs and
practices.

In all of this, I am not denying that propositions are present in pre-modern
Christianity and that their truth matters in an important way. But explicit profession
of beliefs is not the key thing. An analogy may help here. Consider current practices
of immunization. These have been routine for some time in the first world, although
now contested by a small but vocal anti-vaccination movement. On the one hand, the
efficacy of immunization requires that certain propositions be true, and these
propositional truths have been established and are defended by medical and scientific
authorities. Yet the efficacy of a vaccination programme does not require that all
those immunized be cognizant of and assent to propositional truths about how
immunization works. What is required is a trust in medical authorities, a belief in the
public health system, and a willingness to participate in the relevant activity.
Moreover, the point of immunization is not to inculcate correct beliefs about the
operation of vaccines, but to protect against disease and confer ‘herd immunity’. 
Membership of the immune ‘herd’ is not conferred through the profession of true
beliefs, but by being immunized. The threat posed by an anti-vaccination movement
might similarly be thought of in two ways. It could (quite correctly) be thought to lie
in the fact that its proponents hold beliefs that are false. But the primary worry is not
epistemic. It is to do with the health of the children of vaccination sceptics and the
risk posed to others owing to a loss of herd immunity. The medical heresy of anti-
vaccinationists is contested not primarily because of a requirement that they hold true
beliefs per se, but because their false beliefs have practical consequences for
themselves and others.

My argument is that something similar is true for the history of Christianity. It
is common to view the history of Christianity, as Heilbron and Gaukroger seem to,
through a modern lens that privileges propositional content. Thus viewed, the history
becomes largely the history of councils and creedal formulations, of the policing of
boundaries between orthodoxy and heresy, and the persecuting or expulsion of those
who hold false beliefs. My suggestion is that while this contesting of belief is clearly
a prominent feature of ecclesiastical history, it is not ultimately explicit belief in the
propositions that is most important for Christian identity in the middle ages. To
regard Christianity as primarily constituted by propositional belief is akin to seeing
immunization practices as primarily propositional. In both cases the truth of
propositions is crucial, but it is not the main thing. The reason that in the case of
religion we have come to think of propositions as primary is twofold: we have
retrospectively applied the epistemic preoccupations of the present onto the distant
past; and we have constructed its history from the evidence that has been most easy to come by—that which is found in texts and institutional narratives.

2. Playing with Words?

John Heilbron concludes his review with some pointed remarks about my reliance upon data to do with word usage and my assumption that changes in word frequencies can signal significant conceptual shifts—“Let us not distort the historical record by playing with words”. The case in point would be arguments built around the changing meanings of ‘religio’ and ‘scientia’, and the coining of expressions such as ‘scientist’, ‘biology’, and ‘scientific method’. Heilbron rightly points out that phenomena can exist before the relevant words come into common use, although of course there will be clear exceptions. ‘Laser’ is attested from 1960 and it is a fairly safe bet that there were no lasers before then. But matters will not always be so straightforward, as Heilbron’s own example—the word ‘genocide’—seems to indicate. Heilbron notes that while the word ‘genocide’ is attested only from the mid-twentieth century, the phenomenon has a much longer history. The Israelites’ slaughter of the Amorites is his chosen example.

But again, this very example can be understood as supporting the line that I take in the book. The term ‘genocide’ was coined in 1944 by Polish-Jewish lawyer Raphael Lemkin, who invented it to describe the Holocaust (Sands 2016). The coming into existence of this term, in my view, is more informative about the contemporary context than the distant past, even if the word can be applied to past phenomena that seem empirically comparable to more recent events. The relevant 1948 UN convention on genocide is relevant here, censuring acts committed with an intent to destroy “national, ethical, racial or religious groups”. But problematically for any historical application, these categories are taken as given, and this is precisely what is at issue for the historian. One of the key arguments of my book is that the very ideas ‘nation’, ‘race’, ‘ethnos’, ‘religion’ are not natural kinds but rather are ways of categorising groups and activities that have slowly coalesced in modern Western consciousness—they are cultural or historical constructions. Insofar as ‘genocide’ is parasitic on these later notions its retrospective application to the past has the capacity to be misleading.

The intention here is not to deny the existence of horrific acts in the past that bear resemblance to modern instances of genocide. It is rather to point out that it would have been impossible for individuals at the time to have conceived of themselves as committing genocide. Moreover, uncritically applying the label ‘genocide’ to pre-modern events can blind us to otherwise interesting questions that we might ask. Were the Amorites, Gibeonites, or Amalekites analogous to our ‘nation’, ‘race’ or ‘ethnos’, ‘tribe’, ‘religion’, ‘sect’, ‘urban subculture’, ‘criminal gang’, ‘paramilitary group’, ‘racial minority’, or did they have connotations of a number of these? In other words, it makes sense to ask how the ancient Hebrews conceptualised various groupings, and the simplistic use of ‘genocide’ prevents us from asking these kinds of questions. For example, in the unsavoury biblical account
of the slaughter of the Amalekites, what do we make of the fact that oxen, sheep, camels and donkeys were included in the group targeted for annihilation? This set does not map on to any of our familiar modern groupings very well, since it is so much more than a “national, ethical, racial or religious group”. Moreover, what do we make of the apparent insouciance of the reductors of the Hebrew Bible who chose to include these disagreeable episodes in their canonical writings? This clearly indicates a very different moral assessment of the events in question, in stark contrast to contemporary holocaust deniers, or to official Turkish embarrassment about what happened to the Armenians in the period 1915-20. All of these considerations are important for a proper historical understanding of the past.

For reasons such as these (and there are more specifics in the book) it is not mere word play to insist that terms such as ‘religion’, ‘science’, ‘scientist’, and so on, can only be used in a loose sense to characterise phenomena in the distant past. However much historical actors might have engaged in activities that seem to match our modern descriptors, they themselves did not conceptualise their activities that way, and indeed could hardly have done so. It may well be that no twenty-first century mind is ‘agile enough’, to use Heilbron’s Swiftian turn of phrase, to imagine precisely how they did think. And I do not deny the difficulty of escaping from the straitjacket of our contemporary conceptions. But our present failures of imagination should not prevent at least a theoretical concession that people in the past might have conceptualised things in ways radically different from us. Paying careful attention to language and linguistic changes, then, is not mere wordplay but is rather, to use Wittgenstein’s expression, to equip ourselves for “a battle against the bewitchment of our intelligence by means of language”.

3. Internal Realism and the Status of Beliefs

I want to turn now to the two key issues that Yitach Fehige highlights in his comments. The first is what he regards as my ambivalence towards the well established consensus amongst historians of science that the historical relations between science and religion are best characterised as ‘complex’. The second concerns what he sees as an implicit philosophical commitment to ‘internal realism’. I will return to the complexity thesis below, but for now will address the question of internal realism—an issue that to some extent takes us back to the question of propositional truths and their changing status within Christianity.

The stance that I take in the book is that history provides one of the most fruitful ways of gaining insight into contemporary science-religion relations. An obvious alternative to this historical approach, and one not uncommon in science-religion discussions, is to adopt a philosophical analysis of the respective claims of the two entities. As will be obvious to readers of the book, my worry about this latter approach is its tendency to focus on those components of science and religion that are susceptible to such analysis, which is to say, their propositional contents. Philosophical analysis can thus become complicit in reinforcing unhelpful ways of understanding science and religion. I do think, nonetheless, that philosophy has a lot
to offer to this discussion, and my historical analysis is informed by philosophical commitments. I am grateful to Yiftach Fehige for attending to this dimension of the question.

Internal (or pragmatic) realism is associated with the philosopher Hilary Putnam (Putnam 1981; 1982). Briefly, in *Reason, Truth and History* (1981) Putnam argued compellingly against metaphysical realism—the idea that there is a ‘ready-made’ world out there waiting for us to discover. At the same time, and against pure idealism, Putnam maintained that there exists a world that is causally independent of our minds. The distinctive feature of his internal realism is the suggestion that objects are mind-dependent, which is to say that they derive their existence from conceptual schemes that are mental: “Objects are as much made as discovered” (Putnam 1981, 54). Thus, while the world is not a figment of our imagination, the objects with which we furnish it are dependent on our own conceptual schemes. Putnam contends that this remains a form of realism, to be contrasted with both idealism and a ‘facile relativism that says “Anything goes”’ (the latter a reference to Paul Feyerabend’s *Against Method*). Our conceptual schemes, then, are corrigeable, but none, including the sciences, offer us a God’s eye view of the world.

I am sympathetic to this general position, which lies between a naïve metaphysical realism and a self-defeating relativism. I think it works better than the vague and ambiguous ‘critical realism’ that seems have become the default philosophical stance within science-religion dialogue (see Losch 2009). Insofar as our conceptual schemes depend on culture (Putnam argues for culture and biology) this stance is compatible with the arguments of the book, and I can see why Fehige has characterised me as an internal realist. I am happy with the characterization, provided that it is seen to be consistent with some other philosophical, but largely unstated commitments. Putnam’s general approach, insofar as it seeks to occupy a middle position between realism and relativism, stresses the culturally embedded nature of our knowledge, and aligns meaning with use, has some similarities to Wittgenstein’s later thought and, within the philosophy of science, the ideas of Kuhn and Lakatos. My own assessment, as some other commentators have noted, is that my philosophical orientation is closer to Wittgenstein than Putnam (Smith 2015; Ristuccia 2016).

One Wittgensteinian theme of the book, as already hinted, is that some philosophical problems are the result of our bewitchment by language. This is in keeping with the argument that present tensions between science and religion arise out of the concepts themselves. In this sense, the book does not seek to offer solutions to present science-religion conflicts, proposing instead that the putative problems would dissolve were we to abandon the categories that generate them. The other theme, and this relates to Putnam’s point about objects being related to mental concepts, is that forms of language arise out of forms of life (*Lebensformen*). Neither religious beliefs nor scientific theories in this version of events can be fully explicated independently of the forms of life out of which they arise. Again, this is incompatible with metaphysical realism but does not rule out conversation or ‘conversion’, to use Wittgenstein’s term. There is a parallel to my application of these Wittgensteinian
insights to history in the work of Pierre Hadot who applies the idea of forms of life to the history of philosophy. Much more could be said about this (see Harrison 2016). For now it is worth pointing out that this is also relevant to Stephen Gaukroger’s suggestion of a distinction between propositional and non-propositional ways of engaging with the world, which map respectively onto something like religio/religiosity and science. This is not the distinction that I would want to make—it sounds rather like some interpretations of the early Wittgenstein, or 1950s logical positivism. My point would be rather that it is a mistake to construe either science or religion in purely propositional or cognitive terms. What motivates this latter move is often either a misplaced desire to put these two activities into dialogue, or an attempt to demonstrate the rational superiority of science to religion.

4. The Complexity Thesis

Finally, I turn to the other major question that Fehige poses concerning my apparent ambivalence to the thesis of John Hedley Brooke’s classic Science and Religion: Some Historical Perspectives (1991), according to which ‘complexity’ is the best way to characterise historical relations between science and religion. (Brooke is himself cautious about wishing to be seen as the author of an alternative metanarrative, ‘the complexity thesis’.) Like other historians of science-religion relations, I am deeply indebted to Brooke’s work. He, along with David Lindberg and Ronald Numbers, has done more than anyone to dispel the narrative of perennial conflict between science and religion, while at the same time not wishing to argue for enduring harmony either. Brooke’s work provides the foundation and many of the background assumptions upon which my own work is based.

Regarding the conflict thesis, there are two things to say. First, particularly in elements of my previous work, I have strongly emphasised harmony, perhaps to the point of seeming to posit an alternative metanarrative that was equal but opposite to the conflict myth. Here I would simply say that the harmony I draw attention to is not (indeed, cannot be) harmony between science and religion. Rather it is harmony between particular religious ideas or motivations and natural philosophy or natural history. Following on from this I do think that religion is a key factor in the emergence and persistence of modern science, but that its role in those processes remains complex. This is because, as Brooke himself has pointed out, religious factors operate in many different ways—motivating key players, giving social legitimisation to scientific practice, providing a basis for theory choice, furnishing presuppositions for the pursuit of science and, on occasion, contributing to the content of scientific theories. Moreover, religious ideas and practices can have unintended consequences and outcomes that ultimately turn out to be inhospitable to religious ideas and sensibilities. So while I might seem on occasion to emphasise harmony in a way that is inconsistent with an overall picture of complexity, I am not motivated by a normative commitment to the idea of harmony, not least because harmonious relations might turn out to be detrimental to one side or the other.
The other element of my ambivalence to complexity is indeed as Fehige has proposed, a desire to move beyond what Ronald Numbers calls ‘the problem of endless diversification’. I share with Brooke and Numbers the conviction that there is no general historical narrative that can be told about science and religion, and that the popular prevailing narrative of conflict is false. But if there is no metanarrative about science and religion, I do think there is a possible narrative about the concepts ‘science’ and ‘religion’, and this was the topic of the book. That story, accordingly, was not just about historical contingencies, as both Gaukroger and Fehige have assumed. What connects and accounts for the development of these two concepts in the modern West was a move away from a virtue-oriented understanding of persons and the world they live in. This historical shift, associated with both the Protestant Reformation and the Scientific Revolution (scare quotes if you will), promoted the reification of both ‘religion’ and ‘science’, and it was that process that made possible their present relations. To some degree, then, historical complexity is an artefact of reading the categories of science and religion back into history. Beneath this complexity lies a narrative that can be related, and it is a narrative about the common factors leading to the generation of these two concepts. The prevalence of the conflict myth called for a refutation on its own terms. This necessitated some degree of retrospective reconstruction in terms of the modern categories. With that task completed, it remained to give an account of the making of the myth, which in turn called for an account of how the components of the myth were themselves constructed. That new task made possible a new story, related in the book.

It may be, as many contemporary historians believe, that metanarratives (or even just plain, old, modest narratives) are always wrong. But our discipline needs narratives in order to prosper. Even the conflict myth has been fruitful in its own way, for while it has been a source of considerable disinformation it has also motivated much excellent research in the quest to refute it. My modest hope for *The Territories of Science and Religion* is that it too will be fruitful in stimulating conversation and discussion, and, more than this, that it might prove to be more resistant to falsification than the conflict narrative. On the first point, this discussion has been a good start.

**References**


