Deliberating Religion, Science and Progress in the Global Public Sphere: Introduction

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This paper is the introduction to a collection that originated in the IAHR Special Conference “Religions, Science and Technology in Cultural Contexts: Dynamics of Change”, held at The Norwegian University of Science and Technology, Trondheim, on March 1-2, 2012.1

Framing the Issue: Recent Western Perceptions of Islam and Science

“A substantial number of Muslims in Europe lack understanding of the meaning of rational thought, scientific knowledge, freedom of expression, freedom of belief and other central values which have shaped and educated the western world.”

Ole Jørgen Anfindsen, Dagbladet.no, 26 March 2008

“RENOUNED atheist Professor Richard Dawkins received a surprise standing ovation in the traditionally Christian community of Stornoway last night, following a two-hour speech in which he said there was probably no God. The 71-year-old described Islam as “one of the great evils of the world” in his lecture, The God Delusion, as part of a rare visit to the Western Isles. The talk delivered on Lewis during the Hebrides Book Festival proved a major hit among the 220-strong crowd. There was a waiting list of 60 people for tickets, after the event sold out within 40 minutes. Members of the audience cheered loudly as Prof Dawkins used the appearance to attack Islam, while stressing that the “vast majority of Muslims” were not evil, only their religion was.”

Scotsman.com, 3 November 2012

1 Together with the authors, I sincerely thank the editors of Marburg Journal of Religion for generously agreeing to publish this collection of articles in one single issue. In particular I thank Michael Pye and Jocelyn Pye for their great editorial work and advice; the work of preparation has been both a pleasure and a valuable learning experience. I am also grateful to Anna Lydia Svalastog for suggesting the journal to me in the first place, and to her and all the other contributors for their superb articles and their patience in staying on board with this project, despite the long time between the initial conference in 2012 and final publication.
As a concept, “globalisation” means that things are always simultaneously occurring at local and global levels. The first quotation above, from the Norwegian activist Ole Jørgen Anfindsen, declares that European Muslims are less capable of appreciating science and political rights and freedoms than other Europeans. Anfindsen is dedicated to opposing Islam, Muslims and multiculturalism. His brother, Jens Anfindsen, has claimed that since Islam is essentially different from and opposed to ‘western’ and ‘enlightened’ values, Muslims should not enjoy equal treatment. The second quote is a news report about a public lecture on the topic of ‘The God Delusion’ delivered in 2012 by the ‘globally’ famous ‘New Atheist’ Richard Dawkins to a ‘local’ Scottish Christian congregation. It conveys the image of the Christian community enthusiastically endorsing Dawkins’ claim that God is a delusion, as long as it implies that Christianity, unlike Islam, can cope with scientific truths – Christianity thus appearing to be the truly progressive faith while Islam is seen as regressive. Thus, the scientist and professed atheist and religion-critic Dawkins becomes a player in public religious polemics.

The point with placing Dawkins in the company of Norwegian activists is to show that their messages pertain to a global discourse: Muslims cannot accommodate science and therefore they are a social “evil” (in Dawkins’ words). While Dawkins never explicitly suggests that Muslims should be discriminated against on account of their allegedly irrational beliefs, Jens Anfindsen advocates unequal treatment. The examples illustrate the point that public debates on religion and science have social and political ramifications: the Anfindsens use “science” as a determinant for whether a religious group can properly belong to Europe. The diametrically opposite approach is taken by the global brand 1001 Inventions: Uncover 1000 years of science and technology: discover the Muslim heritage in our world, which was launched in the United Kingdom in 2006 and whose global strategic partner is the Abdul Latif Jameel Community Initiatives (ALJCI). To the brand is attached a multiple award-winning touring exhibition and

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2 Hence Roland Robertson’s adage “glocalization”, signifying the simultaneity of the global and the local; Robertson, “Glocalization: Time-Space and Homogeneity-Heterogeneity”.
3 Anfindsen, ‘Islamisation’.
4 Other ‘New Atheists’ of global fame, though with individually distinct profiles, are Daniel Dennett, Christopher Hitchens, and Sam Harris.
5 But note that Dawkins has suggested that New Statesman should rethink their engagement of the journalist Mehdi Hasan because he believes in the miracle that the Prophet Muhammad was taken to heaven on a winged horse; see Brown (2013).
6 According to the 1001 Inventions website, “ALJCI is the Corporate Social Responsibility arm of the ALJ Group, which is a Toyota automobiles distributor in 13 different countries. ALJCI plans and operates numerous global programs, such as poverty-alleviation initiatives, artistic and educational projects and technology innovation grants, including a long history of scholarships for students at Massachusetts Institute of Technology”; http://www.1001inventions.com/credits, 12 April 2013.
educational programme, endorsed by the Prince of Wales, Turkish former Prime Minister Recep Tayyip Erdogan, and the former US Secretary of State Hilary Clinton.\(^7\) On the Homepage 1001 Inventions introduces itself in the following way:

Muslim civilisation stretched from Spain to China. From the 7th century onwards, men and women of different faiths and cultures built on knowledge from ancient civilisations, making breakthroughs that have left their mark on our world.

Learn more about the 1001 Inventions educational programmes, blockbuster exhibitions, award-winning films, books and international productions.

Join us on the journey to the past to inspire a better future! Click here and learn more!\(^8\)

The last sentence is telling: the scientific discoveries of the past are now parts of a global history of science which is still in the making, and in which the lasting contributions of Muslim scientists to the modern empirical sciences and everyday technologies and institutions are included.\(^9\) In the forewords to the book 1001 Inventions by the Chief Editor and Professor of Mechanical Engineering Salim T S Al-Hassani and by Sir Roland Jackson, Chief Executive of The British Association for the Advancement of Science, it is emphasised that science and technology has the capacity to bring people of different cultural and religious backgrounds together in collaborations for the common good. Underlying the claim is the perception that such collaborations could be much improved, between Islamic countries and others, as well as between Muslims and other people within European countries.\(^10\) Regarding European Muslims’ need for the kind of science history offered by 1001 Inventions Al-Hassani writes:

Young Muslims (…) find in such knowledge a new identity, allowing them to be European whilst at the same time Muslims. They find exciting new models, male and female, for innovation and invention, and begin to recognize that these pioneers, unlike many today, had expressed their religious commitment and faith through deeds useful to society, be it Muslim or non-Muslim, and

\(^9\) See the book 1001 Inventions: Muslim Heritage in Our World, Chief Editor Salim T S Al-Hassani, published by the Foundation for Science, Technology and Civilization (2007), where Muslim scientists’ contributions are described under the headings Home, School, Hospital, Market, Town, World and Universe.
\(^10\) 1001 Inventions, pp. 2-3, 9.
that ineptness, looking inwards and reliance on governments to develop society was not their tradition.\textsuperscript{11}

Thus, \textit{1001 Inventions} presents scientific collaboration as a means to include citizens of Islamic countries in the international research community and to further the inclusion of Muslims in European societies. To include scientific achievements from the medieval Islamic civilization in the history of science is thus a simultaneously scientific and socio-political undertaking.

Another intellectual enterprise contributing to a global history of ideas is the web-based \textit{Stanford Encyclopedia of Philosophy} (SEP), whose main site is hosted by Stanford University’s Center for the Study of Language and Communication. The idea behind SEP had nothing to do with religion. It was to facilitate publications of entries from across the globe and to ensure easy updates and open access, and it was born out of frustration with expensive printed encyclopaedias whose entries are outdated before the work is even published, and which are available only at university libraries.\textsuperscript{12} Nevertheless, SEP has profound implications for the study of religion. Its entries transcend the boundary between philosophy and religion through topics such as ontology, cosmology, epistemology and ethics, which are as much ‘philosophical’ as ‘religious’. Under A one finds entries like \textit{Abhidharma} (Buddhist concept); \textit{Abrabanel, Judah} (Jewish Renaissance thinker); \textit{aesthetics/Japanese; Africana Philosophy} (philosophy of the transnational-diasporic experiences of Africans); \textit{African philosophy} (philosophy in African cultures and by African thinkers); \textit{Al-Ghazzali} (Muslim theologian); \textit{Al-Kindi} (Muslim philosopher), and so on.\textsuperscript{13}

Compared with Dawkins and the Norwegian public intellectuals quoted above, whose discourses on the one hand distinguish religion from science, and on the other hand rank religions’ capacities to subject their worldviews to science (with Islam receiving the lowest mark), \textit{1001 Inventions} and SEP assume no essential conflict between religion and science and seek to show that all the world’s civilisations have produced scientific and philosophical knowledge. This collection of fifteen essays makes the case that collaborations in science as well as history of science will benefit from more knowledge about the social and political issues involved at two levels: in public and academic \textit{communication} about religion, science and

\textsuperscript{11} \textit{1001 Inventions}, p. 9.
\textsuperscript{12} Zalta, ‘Stanford Encyclopedia of Philosophy’.
\textsuperscript{13} \url{http://plato.stanford.edu/contents.html}, accessed 13 April 2013.
progress; and in the historical and current cases of interactions between religion and science. In the remainder of this introductory essay, I develop three analytical perspectives, with reference to which I have grouped and described the contributing essays. The outline is therefore as follows: Perspective 1 (Globalisation, religion, communication) with related essays; Perspective 2 (Dynamics of Doctrine and Practice) with related essays; and Perspective 3 (The Politics of Ontology and Science) with related essays.

**Perspective 1: Globalisation, Religion, Communication**

Peter Beyer in *Religions in Global Society* (2006) develops a model for the ways in which religion and science interact and communicate in globalization. Following Niklas Luhmann’s systems-sociology, Beyer defines society as constituted by systems of communication. A system is defined by its communicative code, which is constituted by binary opposites. On the basis of Luhmann’s approach, and with some further elaborations of his own, Beyer has defined the following social systems: individual interactions; organisations; social movements; and societal systems. Societal systems are groups such as families, clans, classes, and nations, and they can be differentiated according to four different types of sub-systems: segmentary, core/periphery, stratified and functional. In modern societies the functional sub-systems have become the dominant type of differentiation. In practice this means that communication is distributed equally over the different function systems, rather than concentrated in one segment or strata of society, and that the function systems are accessible to all segments and strata.

If society is defined by communication, society stops where communication stops. Since communication today actually reaches across the globe through e.g. the function systems, we actually live in a global society. One of the globalized topics of public debates and research is the relationship between religion, science and progress. According to Beyer, “progress” is one of a set of core values intrinsic to global communication, the others being enlightenment, equality, freedom and solidarity. These values are associated with the emergence of the modern nation-states and the transformations of societies from segmentation-stratification to increased functionality and access to communication.

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16 Beyer, *Global Society*, p. 34.
While these transformations and values are sometimes perceived as originating in Europe and the West, Beyer’s concept of globalisation implies that everything is interconnected and there are no fixed origins:

[T]he function systems did not develop first in the West and then spread elsewhere. Their global spread is an integral part of their development; and this is not just as Western imperialism, colonialism and imposition, although that is also an important part of the picture. Looking at globalization not simply as the spread of the function systems but also as their development permits a shift in perspective, from globalization as only the universalization of particular social forms to include now also the reverse, namely the particularization of this universalizing. (…) Globalization carries itself out in the ‘dialogue’, not just as a ‘soliloquy’. 18

The major function systems are politics and government, law, economy, education, science, and religion. While each system communicates through a distinct code, they are interdependent as systems within an organic whole. Religion is thus intrinsically connected with the other function systems, as illustrated by Beyer’s description of the Reformation and the early modern transformations in Europe:

This is much more than just the story of religious reform movements. The Roman church’s rise to the sort of unprecedented prominence that it had in the late European Middle Ages and the Post-Reformation churches greater organization were actually part of a more complex process in which several functionally oriented domains were developing, and in which for equally complex reasons the hitherto dominant stratified structures could not or at least did not stop the process or harness it to their own interests. Thus the rise of the churches becomes at a certain point concomitant with the rise of relatively independent legal systems within those states, with the emergence of a capitalist economic system, and with the assertion of a more and more independent intellectual tradition that claimed empirical knowledge as the only legitimate source (…). 19

Each function system has a primary communicative code, for example law: legal-illegal; science: true-false; education: educated-uneducated; and religion: blessed-cursed. These are further divided into primary and secondary codes: in politics in the form of different ideologies

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19 Beyer, *Global Society*, p. 70.
and parties; in science in the form of the different disciplines; and in religion in the form of different religions as well as organisations and social movements within each religion. Hence, what is defined and communicated as blessed and cursed varies both between religions and within a religion, and depending on which other function systems the religion is interacting with, as will be further discussed below. And it has changed with the modern transformations and globalisation of the function systems. With Beyer’s dialogical perspective the emergence of a global function system of religion should be seen as a process of interaction and reaction in the historical context of European imperialist expansion. It is not the case that a Protestant model has imposed itself analytically and politically on the rest of the world’s religions, as some scholars argue. Rather, on the one hand non-Christian/non-Protestant religions – including Islam – have been incorporated into western societies and into the academic and popular knowledge so that communication about what constitutes ‘religion’ now reflects a considerably more complex view than one based on Protestantism, and on the other hand there are as many global rejections of ‘Protestant’ understanding of religion as there are adoptions of it.

The global religious system differs from the other function systems, however. Because religion in all pre-modern societies shared functions with the other systems that with modernity have become independent from religion – science, education, law, health – religion’s secondary codes overlap with those of other function systems while the other function systems hardly ever use the religious blessed-cursed code. Furthermore, religion has an orthogonal relationship with the other systems, sometimes positioning itself as an alternative to or even in conflict with them. In this way religion is particularly suited to locate “the roots of local and global problems in the operation of these systems”, and in doing so they address “the marginalized people and regions of the world”, articulating the ‘difference’ of groups and cultures from the ‘homogenizing’ global systems. They are also particularly effective at helping for example migrants to adapt to their new societies, by offering ways for people to “structure rapid changes”. Religion can thus facilitate social change, or ‘progress’, by marking certain courses of social action as ‘blessed’ and others as ‘cursed’.

21 Especially Chidester, Savage Systems, p. 141; Fitzgerald, ‘Critique’, p. 108, but also to some extent Smith, Imagining Religion; Asad, Genealogies of Religion; McCutcheon, Manufacturing Religion; see Beyer, Global Society, pp. 62–3.
24 Beyer, Global Society, pp. 103-4.
25 Beyer, Global Society, pp. 104.
Contributing essays

Peter Beyer thus offers a systems model for analysing communications about science and religion, and their globalisation. Some of the contributions published here can be seen as having implications for the practical application of Beyer’s systemic communication model.

The essay by Ingvild Sælid Gilhus takes Beyer’s function systems as the point of departure for her study of ‘the list’ as a technology that crosses the boundary between religion and science, with cases from ancient Mesopotamia; Rome of late antiquity; and contemporary Norway. By selecting lists across history, societies, and cultures in this way, Gilhus also highlights the role of public media communication for transcending the boundary between the two function systems religion and science, which in turn sheds new light on the function of both modern and pre-modern lists as ‘mergers’ of religion and science. Lists ‘certify’ knowledge in a particular way, in religious contexts as well as in media communication of scientifically produced data.

Tinni Goswami Bhattacharya does not explicitly engage with Beyer’s model, but her study of Ayurveda and the treatise Caraka Samhita (ca. 200 BCE) can be seen as illustrating the ‘systemic impact’ of globalisation. Traditionally, Ayurveda was part of the Indian Vedic religious system practiced by specific experts, the Vaidyas, who intended it exclusively for kings and priests. The Caraka Samhita describes a holistic system where the Vedic deities, the cosmos, and the human organs are all interconnected. Alongside ontological schemes and prescriptions of religious practices, the Caraka Samhita describes the human anatomy and treatments based on empirical medical practice. Bhattacharya argues that the blending of religious and medical practices is not random. As opposed to early modern medicine where health has been seen as the absence of disease but in line with the WHO’s current definition of health, the Caraka Samhita aims at comprehensive social, mental and physical well-being by combining ontology, religion, social rules and medicine. However, in post-colonial India and in the global economy, Ayurveda has become a commercial brand of ‘alternative medicine’ products, which anyone can buy, and which are detached from the holistic but socially segmented system of the Caraka Samhita. Thus, while the logic of globalised function systems has placed Ayurveda in the health-system, the concomitant detachment from its religious and social dimensions has deprived it of its original therapeutic usefulness.
The third essay engages directly and critically with both discourse theory (see below) and Beyer’s binary opposition-model of systemic communication, including his identification of core global values. Anna Lydia Svalastog argues that it distorts what she finds to be the most significant trait of religious communication, namely its drive to transcend oppositions. In particular, Svalastog takes issue with Beyer’s global code for ‘liberal’ vs. ‘conservative’ religious communication. She replaces his fixed codes with hermeneutics, according to which meaning is contextually and subjectively constructed and therefore fluid, and ‘myth-making’ as an interpretive, exegetical process. Applying ‘myth-making’ in this sense to narratives about genetic modification, Svalastog shows how academic critics of genetic engineering communicate by referring to Jewish and Christian motifs and values. The critics use these religious motifs and values to combine academic history of society and of science with personal memories of science in modern history, especially connected with the Second World War. This ‘myth-making’ kind of criticism cannot be fitted into a binary opposition between either liberal versus conservative, or blessed versus cursed, Svalastog argues: rather, it bridges oppositions.

As for values, she finds that the core value motivating the criticism is ‘sustainability’, rather than Beyer’s values progress, justice, equality and solidarity.

Also addressing the topic of ‘sustainability’, Fionn Bennett rises to challenge a missing piece in Beyer’s systems model: communication between global society and non-human realities. Seeing this kind of communication as decisive for attempts to address the environmental crisis, Bennett proposes that we consider afresh the ‘communication interface’ used in the archaic ‘magical worldview’, namely ‘theurgical incantatory magic’. The goal of this mode of communication was to synchronise human communities to a higher order, existence embracing ‘kosmidicy’. This synchronization was essential for making sure that the pursuit of human felicity respected limits, which prevented it ever being harmful to the greater-than-human Umwelt. Key to consummating this aspiration was the effort to ‘give nature a voice and a language’ and to factor the intelligence it communicated into the community’s values, ethics, arts, science and technologies. When this is true, the community’s entire ‘enkyklopaideia’ becomes an incitement to having, doing, and being what it is good for the entire kosmos for the community to have, to do, and to be. This communication interface therefore gives global society something it badly needs but which Beyer’s model does not give it, Bennett argues: the means to engage in an ‘entente cordiale’ with the environment.
Perspective 2: Dynamics of Doctrine and Practice

The French historian of religion Michel de Certeau (d. 1986) and his perspective on the modern discipline of Religious studies adds a dimension to Beyer’s systems approach to the relationship between religion and science. De Certeau embodied both the modern science of history and traditional Catholic scholarship. His main sources of theoretical inspiration were Marx and Freud, expressed in de Certeau’s works through his focus on how institutionalised practices of knowledge production ‘suppress’ knowledge associated with competing institutions.26 The historian’s task is thus to identify ‘the suppressed’ in historical discourse and, as it were, bring it back to consciousness.

Depending on the individual historian’s personal interests, what is identified as suppressed will necessarily vary. In The Writing of History (1988/1975) de Certeau explores how religion has been suppressed in the process of what Beyer calls the modern transformation of the function systems. From de Certeau’s French perspective the transformation took place in the revolutionary shift from the Church as the knowledge-producing institution to the modern university and the development of a new sociological discipline for the scientific study of religion.27 The institutional shift entailed a new practice of writing about religion. Simply put, the Church’s practices of writing implied that Christian doctrine and ethics explained society and individual practice, whereas modern French religious studies conceptualise religion as a social phenomenon and studies religious people’s practices but without perceiving their beliefs to be of value for explaining society.28 In de Certeau’s view, French sociological religious studies thus established through the institutionalised, discursive practices of writing a “schism between social religious facts and the doctrines which claim to explain their significance”.29 This discursive practice has consequences for sociology of religion itself because it fails to take into account that religion is an intrinsic part of social development, reflected in the dialectical relationship between belief/doctrine and practice.

De Certeau’s historical studies dwell on this relationship. For example, he shows that modern French religious studies concern with religious practice and behaviour is itself a reflection of

26 Ahearne, Michel de Certeau.
27 De Certeau, Writing; this problem-area is treated throughout the Introduction and the first four chapters.
28 De Certeau, Writing, pp. 25-7.
the religious changes that took place in France after the Reformation. In the sixteenth century, public demarcation of religious communal identities – Catholic or Protestant – became a paramount doctrinal and socio-political concern, because the Reformation was coupled to the political transformation of empire to nation-states. Since the new states were grounded in religious identities, religious practices had to signify doctrinal differences, i.e. signal to society who was Catholic and who Protestant. Difference in practice thus became the most important outward sign of communal belonging, while belief and doctrine, though still the actual determinant for practice, was not communicated outwardly as such. Sociology of religion, in its concern with practice and ‘suppression’ of doctrine, paradoxically mirrors the change that had taken place within religion itself, and thus it became unconsciously caught in the throes of modern European Christianity’s communication, unable to create the critical distance from its subject-matter that is required for proper analysis. This analytical inability arises from the fact that modern French religious studies ‘writes religion’ only as an object of analysis, not as an analytical subject worthy of consideration.30

From de Certeau’s perspective, religion and science are thus inextricably linked, in terms of analytical entanglements as just mentioned, but also at the very foundation of academic scholarship. Religious Scripture is, according to de Certeau, the cornerstone of modern ‘scriptural’ society, and while modern society tends to see itself as replacing religious institutions and knowledge, in reality it is rather a transformation which implies continuity. Yet the practices of scientific writing about religion tend to suppress continuity by placing religion in a temporally ‘past’ relationship with ‘present’ institutions and knowledge disciplines. Again, this practice expresses the institutional separation between religion and science that occurred with the emergence of the modern universities and disciplines, which make religion into an object of study, not an analytical subject.31

Such practices of writing religion have consequences also for how the relationship between religion and philosophy is perceived. ‘Before’ the academic study of religion was separated from the Church, philosophy was integral to theology and dogma. With the modern universities, however, Theology (with its philosophical components) is defined as a normative discipline assigned to the Church or to confessional seminaries, while Philosophy has become an autonomous university discipline. While the discipline of Religious Studies can include the

30 De Certeau, Writing, pp. 31, 125-46, 147-68.
descriptive study of religions’ theologies and dogma, the history of religions is taught and written separately from philosophy. While the distinction between normative and descriptive objectives constitutes an important difference between theology in the service of the confessional community and the academic study of religion, the separation between Philosophy, Theology and Religious studies may, with de Certeau’s perspective, limit understanding of how religious doctrine and practice relate to social and scientific change.

Contributing essays

The two essays grouped under this perspective treat the dynamics between belief and practice, one from a descriptive standpoint and one with an explicit prescriptive agenda. Both contributions dwell on ontology and the desire to move established boundaries and relations between humans, animals, and nature. Thus, similar to Fionn Bennett’s contribution described above, these two essays illustrate de Certeau’s point, that ‘doctrine’ (including ontology and cosmology) is developed in specific contexts, for specific analytical purposes. Viewed from this functional perspective, ‘doctrine’ is comparable to theory in the Humanities and Social sciences.

The descriptive contribution by Alessandro Zir explores ontology as differentiator between religion and science. Zir’s source material consist in sixteenth century Portuguese narratives about the nature of Brazil, which have previously been treated as early scientific works. However, Zir shows that their ontology differs from that of empirical early modern science. The Portuguese narratives are grounded in a Neo-Platonic ‘ontology of excess’ which is mythical, seeking to describe states of existence that transcend measurable time, space and substance. While such ontologies are not scientific, Zir argues they are insightful and analytically valuable as indicators of situations when people refuse to accept that the here and now is all there is to it.

On the basis of a normative critique of the use of animals in biomedical research, Alma Massaro develops a Christian animal theology based on the Biblical models of animal and human relationships. The Biblical model is developed as an alternative to the modern Positivism and Cartesian rationalism that shaped modern Christian culture and thus explains why Christians conduct ‘impious’ biomedical animal research. Where the Cartesian view of animals is instrumental and subjects them to human needs, the Biblical and early Christian view, in
Massaro’s analysis, is based on caring responsibility and a view of humans and animals as equals in creation. Thus, Massaro constructs a Christian theological demand for change regarding the practice of using animals in biomedical research, through her interpretation of Biblical creation myths.

Precisely because of Massaro’s explicit theological framework and normative aim, the essay makes an interesting reference point for Svalastog’s critique of Beyer, described above. Firstly, Massaro’s approach supports Svalastog’s point about the usefulness of hermeneutics and ‘myth-making’ as frames for analysing global science criticism, which draws on religious sources and topics: this study and criticism involves interpretation of Biblical myths and Christian history of ideas. Secondly, Massaro’s interpretations transcend boundaries between humans and animals, in line with Svalastog’s argument that religious science criticism transcends rather than establishes opposites. Yet it constructs other, epistemic binary opposites. Just as Svalastog’s own critique of Peter Beyer ‘dichotomises’ hermeneutics and myth versus systems theory and discourse theory, Massaro opposes Cartesian rationality and Positivism diametrically to Biblical and Christian animal ethics, effectively constructing a binary code. This code also informs Massaro’s historical claim. Previous animal ethics research traced the modern instrumental view of animals to the Bible and the Christian heritage. To the contrary, Massaro argues, the instrumental view and practices that characterize Positivism and Descartes trace back through the Renaissance and the revival of ancient Greek, non-Biblical thought and practices, which also shaped the thought of some of the Church Fathers and medieval scholastic theology. In this way, Massaro’s analysis establishes a binary code regarding animal ethics, which opposes ‘the Bible (Old and New Testament)’ versus ‘Greek philosophy’. Thus, although her objective is theological, it also involves a historical claim to ‘truth’, in terms of Beyer’s science-code.

**Perspective 3: The Politics of Ontology and Science**

The modern disciplines of Sociology and Religious studies emerged around the same time, shortly after the publication in 1859 of Charles Darwin’s thesis on the evolution of the species through natural selection. While the theory of evolution was not intended to have anything to do with the social sciences, it was embraced with enthusiasm by many positivists who claimed to be able to study the ‘evolution’ of human thought and societies. The pioneers of modern Sociology devoted much of their theorizing to the role of religion in modern society. Albeit on
different theoretical grounds, Karl Marx (1818–1883), Émile Durkheim (1858–1917) and Max Weber (1864–1920) concluded that the progress of modernity would entail the demise of religion. In Religious studies, the Founding Fathers Edward Tylor (1832–1917) and James Frazer (1854–1941) were particularly interested in the relationship between religion and science. Tylor, representing the evolutionist view, found that religion was a pre-modern version of science, which in modern society constituted a ‘survival’ of primitive, pre-scientific worldviews. Given religion’s survival and even flourishing in the modern world, the bulk of contemporary Religious Studies and Sociology have abandoned such early evolution-inspired theories. However, popularized science, represented by Richard Dawkins and the other so-called ‘New Atheists’ Christopher Hitchens, Daniel Dennett and, most recently, Sam Harris, can be seen as reviving the old positivist approach to religion as a ‘survival’, i.e. as something which belongs to the past even as it exists in the present.32

‘New Atheism’ has not emerged in a vacuum. While it is a broad religion-critique, it also draws on the global discourses and practices related to ‘the War on Islamic Terror’ and the global spread of Creationism and Intelligent Design (ID), the originally American Christian narratives about the origin of life which challenge evolution theory through an alternative ‘theory’ derived from the Biblical creation myth. Since the late 1980s a version of US Creationism has been popularised among Muslims in Turkey, where the Ministry of Education, together with the Islamic foundation fronted by Harun Yahya (aka Adnan Oktar), has produced school textbooks containing Islamic versions of ‘scientific creationism’ and which have become popular also among European and American Muslims.33 ‘New Atheists’ have raised public awareness of Creationism and ID as a serious problem in school teaching of science as well as for scientific and social progress. The issue has been addressed at the highest levels of science institutions. In the UK, a 2006 poll showed that around 20% of the population thought that Creationism and ID were true explanations of the origin and development of life, compared with 50% for evolution. Over 40% thought that Creationism and ID should be included in science teaching. Richard Dawkins pitched into the debate in 2008, blaming particularly Muslim parents for raising their children to believe in divine creation and thus bringing Creationism to the UK, and multiculturalism for making science teachers think they are obliged to accommodate religious beliefs.34 Michael Reiss, Director of Education at the Royal Society and ordained priest,

32 Dawkins, God Delusion; Reality; Hitchens, God is Not Great; Dennet, Breaking the Spell; Harris, End of Faith.
33 Numbers, Creationists, p. 335; Edis, Harmony; Hameed, ‘Islamic Creationism’;
34 Gardham, ‘Muslim parents’.
suggested instead that school teachers should address Creationism as a *worldview* held by large numbers of pupils, not as a flawed scientific theory, because simply dismissing their views would risk putting these students off science altogether. The implication of Reiss’ view was that science teachers should teach Creationism in a manner that defuses it as a challenge against evolution. By teaching Creationism as a religious worldview, it would be distinguished from the scientific theory of evolution. The approach implies that belief in divine creation can coexist with evolution if students are not forced to make a choice; by comparison, the ‘New Atheists’ insist that for science to survive the choice must be made and in favour of evolution. Subsequently, Reiss was forced to resign from his position at the Royal Society, charged with wanting Creationism to be taught as an alternative to evolution. Not all science peers agreed over Reiss’ resignation. Lord Winston, fertility researcher and a well-known public scientist in the UK, thought the wrong decision had been made:

> I fear that in this action the Royal Society may have only diminished itself. This is not a good day for the reputation of science or scientists. This individual was arguing that we should engage with and address public misconceptions about science – something that the Royal Society should applaud.\footnote{36}

In the USA the question of whether Creationism should be taught in schools is a long-standing controversy. A 1987 Supreme Court ruling forbids teaching of Creationism in science classes because it violates the constitutional separation of religion and state. Creationists tried unsuccessfully to circumvent the ruling by switching the term from Creationism to Intelligent Design. A more fruitful strategy has been to resort to social constructivist epistemology: since all knowledge is theory-dependent and theory is socially constructed, no theory holds the whole truth about the universe and the origin of life.\footnote{37} Former President George W. Bush – a born-again evangelical Christian – represented this approach when he declared that Creationism and ID should be taught alongside evolution so that children understand “what the debate is about”.\footnote{38} In April 2012 a bill was passed in Tennessee State allowing science teachers to “teach the controversy”, i.e. to critically examine scientific theories deemed controversial: evolution theory, man-made climate change, cloning and embryonic stem cell research. The bill which

\begin{footnotes}
\item[35] Randerson, ‘Teachers’.
\item[36] Sample, ‘Reiss resigns’.
\item[38] Bumiller, ‘Bush’.
\end{footnotes}
was supported by a socially conservative organization in the state\textsuperscript{39} was modelled on a 2008 bill from Louisiana State which was passed and which reads:

Recognizing the importance of critical thinking, logical analysis and objective discussion in education it is the intent of the Legislature to foster an environment in public schools where such learning occurs. (…) Legal challenges to academic freedom bills have historically alleged that such bills are intended to allow the teaching of creationism or intelligent design. This bill does not propose that schools teach creationism or intelligent design, rather, it is the intent to foster an environment of critical thinking in schools including a scientific critique of the theory of evolution. (…) 

A. The State Board of Education, upon the request of a school district board of education, shall allow and assist teachers, principals, and school administrators in creating an environment within the public school system that promotes critical thinking, logical analysis, open and objective discussion of scientific theories including, but not limited to, evolution, the origin of life, global warming, and human cloning. Assistance shall include support and guidance for teachers regarding effective ways to help students understand, analyze, critique, and objectively review scientific theories being studied, including those enumerated in this subsection.

B. A teacher shall teach the material presented in the standard science textbook and may use supplemental textbooks and instructional materials to help students understand, analyze, critique, and review scientific theories in an objective manner.

C. This act shall not be construed to promote any religious doctrine or set of religious beliefs.\textsuperscript{40}

Ronald Numbers has pointed out that while Creationism is centred round belief in divine creation as described in the Bible, creationists are not against science, as such, nor do they literally follow the biblical text. Rather, they forge alternative scientific theories out of the Biblical creation myths by freely adding to the Biblical version whatever they believe is necessary to convince the general public of their case. The socio-political side to Creationism

\textsuperscript{39} McWhirter, ‘Tennessee’.
\textsuperscript{40} Senate Bill 1742.
is the conviction that evolution theory reflects a society where everyone struggles for survival and where women compete with men over jobs, which threatens the nuclear heterosexual family and its definitive, ‘God-given’ gender roles:

The divine order of the sexes is a corollary doctrine of the order of creation. It established the family as the natural unit within society and the church (...). The husband/father is given the headship in the family and the church with the wife/mother as an assistant and chief educator of the children.\(^\text{41}\)

This perspective means that Creationism in the USA can only be fully understood if the doctrine of divine creation is seen in relation to gender conservative practice. All the science-related topics defined as ‘controversial’ in the Louisiana bill (quoted above) were defined as such by people who see themselves as in opposition against what they perceive as invasive state power: public schooling with its teaching of evolution; regulations related to carbon emissions; and the whole compound of issues related to abortion, embryonic stem cell research and cloning. Christian beliefs thus become arguments in a political critique of state interference with family life and freedom to choose – not abortion, perhaps, but a gas-guzzling car. Along the same line, a positive correlation has been identified between belief in the imminent return of Christ and unwillingness to accept any measures related to climate change, the logic being that God has anyway predetermined the end and it is near.\(^\text{42}\)

In the USA these religio-political deliberations over ‘controversial science’ are linked to a broader popular distrust in science.\(^\text{43}\) Public trust in science peaked before World War Two but then decreased steadily across the population until the 1970s. At that point the downward trend stabilised – except within the New Right (NR), associated with Ronald Reagan’s presidency, neo-liberal economics, and Christian conservatism. NR conservatives have since become steadily more distrustful of science, particularly concerning the ‘controversial’ issues evolution, climate change and cloning. It is also the case that US conservatives are more suspicious of science the higher their level of education, while liberals show more trust in science the higher their education. It has been suggested that this reflects the NR’s combination of social constructivist epistemology with specific political goals. This ‘conservative epistemology’

\(^{41}\) Numbers, Creationists, p. 337.
\(^{42}\) Barker and Bearce, ‘End-Times’.
\(^{43}\) Gauchat, ‘Politicization’.
legitimises deconstructing scientific evidence that supports liberal causes, and producing scientific evidence that supports one’s own views:

[C]onservatives were far more likely to define science as knowledge that should conform to common sense and religious tradition. Relating to the second pattern, when examining a series of public attitudes toward science, conservatives’ unfavorable attitudes are most acute in relation to government funding of science and the use of scientific knowledge to influence social policy (…). Conservatives thus appear especially averse to regulatory science, defined here as the mutual dependence of organized science and government policy. (…) The rise of neoliberal science management regimes since 1980, particularly the insistence on the commercialization and privatization of knowledge, has created substantive shifts in the organization and practice of science. Perhaps the most obvious shift is the rollback of government funding for, and organization of, public research universities.44

Privatization of universities and research centers has thus enabled the NR to launch a counter-science program producing research in line with neo-liberal economics and religious conservatism. The recent bills from Louisiana and Tennessee allowing ‘critical examination’ of evolution theory, climate change and cloning are results of the same political effort. And the science debates spill over into party politics. In 2001, Republican President George W. Bush banned the use of federal funds for embryonic stem cell research; in 2009 the Court of Appeal overruled the ban under Democrat President Barack Obama; and in the 2012 presidential election campaign the Republican candidates pledged to reinstate the ban if they were elected.45

The case illustrates how state policy can play decisive roles for relations between religion and science. The Middle East presents interesting examples, particularly since its religions are commonly associated with social conservatism. Notably, studies show that Jewish and Islamic religious authorities approve embryonic stem cell research, while the Christian churches in the Middle East oppose it.46 In Saudi Arabia, Sunni Muslim religious authorities have approved embryonic stem cell research and cloning for therapeutic purposes within the gestation period of 120 days.47 In the Islamic Republic of Iran, legal opinions issued by Shiite Muslim jurists approve research on cloning for therapeutic purposes using stem cells from foetuses aborted

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45 Tumulty, ‘Gingrich’.
46 Flynn and Matthews, ‘Stem Cell’.
47 Jain, ‘Ethical’, p. 826.
within 120 days after fertilization. The following quote from a journal article by Iranian authors illustrates the argumentation:

Many of the arguments against human cloning are grounded in the fact that human cloning is dangerously similar to “playing God”. But from an Islamic perspective, cloning does not bring into question any Islamic belief. The creator of the universe has established the system of cause-and-effect in the world; all creation takes place solely through His will. Cloning would be only manipulating God’s creation, therefore scientists would not become God or replace God.48

Here the belief in divine creation, which the Islamic Scriptures described in terms broadly similar to the Biblical versions, is diverted from the question of the origin of life towards another closely related and long-standing doctrine, i.e. that causality ultimately is with God. The reasoning is straightforward: if humans are able to do cloning (for ethically acceptable purposes) it is because God has willed it.

Different ontologies thus reflect different religious positions regarding science. This is further demonstrated by Elizabeth Bucar’s comparison of Iranian Shiite clerics and the Vatican concerning transsexuality and the permissibility of surgical sex change, i.e. when a person experiences a mismatch between their body and their sexual identity and wishes to change the body accordingly. The founder of the Islamic Republic, Ayatollah Khomeini (d. 1989), introduced a new policy for persons who wish to undergo such surgery. The policy was based on Khomeini’s legal reasoning that a person’s social rights and duties rest in his or her embodied gender. However, according to Shiite Platonic ontology, the body is matter while the soul is spirit and represents the individual’s identity. Sometimes the physical, embodied appearance does not correctly reflect the soul. Transsexuality is therefore a physical disorder, which can be corrected with modern treatment and surgery.49 On the contrary, the Vatican position uses Aristotelian ontology, to the effect that body and soul are one, so there can be no mismatch

49 A note on Plato: Aspects of the constitution of the Islamic Republic of Iran mirror Plato’s Republic, e.g. the principle of rule by the enlightened philosopher-analyst (faqih), and the Guardian-council; on the revolution-ideologue Ali Shariati and his Platonic ideals, see Keddie, Roots, p. 224. Concerning sexual identity, permissions to change sex in Iran relate to the fact that all non-heterosexual relationships are illegal: only men and women can legally have sex. Gays and lesbians unable to hide their sexual identity may therefore face the medical option of a sex change, i.e. a man desiring sex with men can become a woman, and a woman desiring sex with women can become a man. For further studies of transsexuality in the context of these wider issues of sexual identity in Iran, see Najmabadi, ‘Transing and Transpassing’; Saeidzadeh, ‘Transsexuality in Contemporary Iran’.
between true, personal sexual identity and embodied gender: they are one and expressed as the bodily form. Transsexuality is therefore perceived as a psychological refusal to come to terms with one’s sexual identity, which can be corrected through therapy.\textsuperscript{50} In these two cases, ontology is actively employed in order to define two religious doctrines and ‘sciences of transsexuality’, with corresponding policies.\textsuperscript{51}

However, state policy can also be decisive in its own right. In a study from 2010, Elise Burton has studied teaching of creationism and evolution in four Middle East countries: Iran, Saudi Arabia, Turkey and Israel.\textsuperscript{52} Iran is a theocracy, which combines strong Islamic national identity, state-imposed value conservative public order and strong science policy. Evolution is taught in science classes at all levels of public schooling, consistent with the most recent research. In fact, the Islamic Republic maintained the secular education model that was established by the modernizing Pahlavi Shahs in the first half of the 1900s. As a result, Iran produces advanced stem cell research. Saudi Arabia, a religiously legitimised monarchy with a still weak science policy, taught creationism in public schools and its science textbooks dismissed evolution as a Western erroneous theory. In the same time, embryonic stem cell research was approved by the Saudi religious authorities and was being carried out at new universities. Turkey, a secular republic with a strong science policy, also allowed creationism to be taught in public schools. In Israel, a secular state with Orthodox Judaism as official religion and a strong science policy, creationism was becoming increasingly popular in some public schools, which offer a ‘religion line’ in the curriculum. Increasing numbers of Israeli teachers did not teach evolution in classes with many religious pupils in order to avoid conflict.

In sum: there is no simple connection between state secularism and evolution teaching. In fact, of these four Middle East countries theocratic Iran had the most coherent science policy in the sense that it both teaches evolution in science classes in school and has invested heavily in national research. Saudi Arabia, on the other hand, showed an intriguing transitional scenario where the religious authorities support embryonic stem cell research with reference to Scripture and legal precedence (on abortion) but totally reject evolution theory, also with reference to Scripture. Two conclusions can be drawn from this: religion adapts to state policies; and there

\textsuperscript{50} Bucar, ‘Bodies’.
\textsuperscript{51} Indeed, Saeidzadeh, ‘Transsexuality in Contemporary Iran’, also discusses how the overly scientific approach to transsexuality in Iran corresponds to the approaches to the topic in classical Islamic jurisprudence (\textit{fiqh}), whereas Iranian social mores and substantive national law still lag behind on recognitio and rights for transsexual persons (in addition to homosexuals).
\textsuperscript{52} Burton, ‘Evolution and Creationism’.
is no certain pattern as to the effects of creationist beliefs in the population on a nation’s capacity for science and research, since that ultimately depends on the state science policy.

One final historical example will illustrate the point about state policy. As mentioned above in connection with *1001 Inventions*, rational philosophy and empirical sciences (astronomy, physics, medicine, and agriculture) flourished under the patronage of the medieval Islamic states. In a recent study, George Saliba deconstructs what he calls the ‘classical narrative’ about science in the Islamic world. According to the classical narrative, the Arab Muslims came into contact with science when they expanded their Arabian polity into an empire, which included the Byzantine Hellenistic and Sassanid Persian civilizations; in particular the former is considered causal for the development of science under Abbasid patronage. However, the ‘classical’ argument goes, the Muslims never made new discoveries and inventions but merely preserved and commented on the Byzantine sciences. However, even that form of imitative science and philosophy ceased as Islam matured. The ‘classical narrative’ appoints al-Ghazzali’s (d. 1111) grand synthesis of theology, mysticism, and law, as the end of philosophy and science, which suffocated under the pressure from an all-encompassing and all-powerful religious orthodoxy. This dominance of religion over rationalism and free scientific enquiry is supposed to have generated an intellectual as well as political-cultural decline, which to this day holds the Islamic world in its grip.53

However, Saliba’s own research on astronomy disproves the classical narrative. Astronomy under the Abbasid caliphate was no mere preservation and commentary on Byzantine astronomy. It was an innovative scientific enterprise whose discoveries falsified the ancient Aristotelian and Ptolemaic systems dominating Byzantine astronomy. Moreover, it did not cease after al-Ghazzali but rather increased, in both quantity and quality: again, new discoveries were made and earlier findings revised. Nor did philosophical rationalism end with al-Ghazzali, but it was incorporated into the Ash‘arite theology. Indeed, Saliba shows, al-Ghazzali himself and the rationalist theologians after him criticized some of the Aristotelian philosophers for

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operating with a too essentialist and non-empirical ontology. Although the theologians formulated their critique in terms of a problem of logic, it corresponded with the astronomers’ empirically grounded criticism of Aristotelian cosmology.\(^{54}\) It was only after the 1600s that decline in astronomical research and development set in. At that point, the scientific decline resulted from the economic decline that followed from expanding European colonialism and trade, with which the Islamic empires of the time were unable to compete. Hence, the rulers’ financial capacity for patronage drastically diminished without any corresponding development of a capitalist industrialised economy, which could have supported the growth of modern research institutions.\(^{55}\) In other words, the post-Ghazzali Sunni Ash’arite theology had no negative impact on science, on the contrary: al-Ghazzali developed it in order not to conflict with the latest astronomical research of the time. Ash’arite theology after al-Ghazzali can thus be described as an example of how religion can facilitate science.

**Contributing essays**

The essays placed under this heading focus specifically on the instrumental aspects of employing ontology and cosmology to achieve desired religious approaches to science.

Ilaria Ramelli contributes an exposé of Gregory of Nyssa (335–c. 394 CE) and his dialogue *On the Soul and the Resurrection*, which reflects his view of the relationship between the Christian faith and the sciences of his day. Gregory perceived all knowledge as mediated through reason (*logos*), a capacity that God has implanted in all humanity – even in pagans! The human *logos* is a microcosmic version of the divine *Logos*, manifest as Christ and described in Scripture. Since all human knowledge is thus an expression of *logos-Logos*, there can be no contradiction between rationally expounded doctrine and the sciences, and Ramelli demonstrates how Gregory developed his doctrines on the soul and the resurrection with reference to the latest results of astronomy, medicine and agriculture. In Ramelli’s terms, Gregory represents a form of ‘creationism’ since he welded together faith and science through a (Neo-Platonic) theory of


\(^{55}\) Saliba, *Islamic Science*, pp. 244-55.
creation through *logos* – in practical terms like al-Ghazzali’s adaptation of Ash’arite theology to the astronomical cosmology of his time (see above).

In the second essay, Stefano Bigliardi compares Biblical, Christian and analytical philosophical concepts of ‘miracle’ with Qur’anic and Islamic ones, particularly as expressed by modern thinkers with agendas to reconcile religion and science. Thus, Bigliardi shows, modern Western analytical philosophers define ‘miracle’ as a religiously significant event, which violates the laws of nature. In the Islamic context, the Qur’an itself is considered as the supreme miracle and as an expression of nature, not a violation of its laws. Some modern Muslim thinkers emphasise the scientific nature of the Qur’an in such a way that they turn science into a miracle. However, given that the Qur’an was traditionally believed to ‘miraculously’ reflect the uniquely divine knowledge about all of reality, the strategy of lodging science in the Qur’an may have served to ‘indigenise’ modern science to traditional Islamic cultures. The differences between analytical philosophical and Islamic concepts of miracles suggest to Bigliardi that analytical philosophy, which claims universality, needs to engage with other systems of thought in order to say something valid about miracles in particular, and about relations between religion and science in general.

While the Qur’an is believed to be a miracle, Abeer al-Abbassi shows that historically it introduced a rationalizing, empirical approach to the universe. Al-Abbassi treats the pre-Islamic Arabs’ preoccupation with real connections between heaven and earth and their application in divination and astrology, and the ways in which the Qur’an transformed these cosmologies. The pagan Arabs’ cosmology drew on Hellenistic and Persian models and imagined the universe as a unity, in which the heavenly bodies ruled over the earth and shaped people’s lives and futures, and consequently were worshipped as deities. Islam retained and developed Arab cosmology and astrology but within an Abrahamic, monotheistic framework, where power and worship was due to God alone, not to the stars. In this Islamic cosmological context, stellar calculations were developed for the purposes of religious calendars, improved navigation techniques, and weather forecasts. Al-Abbassi concludes by paraphrasing Pope John Paul II, suggesting that the Qur’an “speaks to us of the origin of the universe and its make-up, not in order to provide us with a scientific treatise but in order to state the correct relationships of man with God and with the universe”. Thus, the Qur’an and Islam involved the de-mythologization of the Arabs’ cosmologies and an orientation towards empirical research of the universe.
The theme of heaven and earth appears also in Saeid Edalatnejad's comparison of four renowned Muslim Qur’an commentators’ interpretations of Qur’an 21:30, a verse describing how God separated heaven and earth making the former pluvial and the latter alluvial. In particular, Edalatnejad shows how the history of Qur’an interpretation reflects different cosmologies. The jurist al-Tabari (d. 923) represents a mythical approach aiming at an interpretation consistent with the internal Qur’anic meanings. He concluded that Q. 21:30 describes not how God originated heaven and earth but how they acquired their specific functions of providing respectively rain and growth. The Ash‘arite theologian and jurist al-Razi (d. 1209) aimed at the verse’s literal, internally consistent meaning, concluding that it describes how God distinguished between heaven and earth through the act of dividing or splitting; in other parts of his commentary, he drew on available astronomical cosmologies to describe heaven. Al-Tantawi (d. 1940) represents the type of modern commentary (also treated by Bigliardi, above), which seeks to reconcile the Qur’an with contemporary science in order to bring Muslims into step with progress. Ignoring medieval commentators like al-Tabari and al-Razi, he explained the verse as presaging modern astrophysics. Finally, the second modern commentator, the jurist al-Tabataba’i (d. 1981), aligned with al-Tabari’s and al-Razi’s interpretations of the verse, that it was about how God changed the conditions of the heaven and the earth, not about how He originated them. Although al-Tabataba’i’s overall aim was not to reconcile the Qur’an with science, like al-Tantawi sought to do, he still ensured that his interpretations did not contradict the scientific theories of the universe that he knew about. In this way, Edalatnejad shows how all four exegetes approach the Qur’anic verse from the perspective of theology and myth, while two of them also used their knowledge of current science to shape their theological-mythical explanations.

Abdulla Galadari, author of the fourth contribution to this perspective, is personally engaged in resolving the conflict between creationism and evolution. For this purpose, he produces a new literal understanding of how the Semitic language Scriptures, here the Hebrew Bible and the Qur’an, describe creation. Point of departure is Galadari’s assumption that most Muslims believe that the Qur’an, if read literally, expresses a worldview in which God created reality out of nothing (ex nihilo), and which is incompatible with evolution theory. Using a comparative philological method, Galadari argues instead that if read literally, Scriptural accounts of creation appear as spiritual comments on evolution, rather than as explanations of how God originated reality out of nothing. Galadari’s literal reading rests on a distinction between creation (khalq) and being (kawn). Creation (khalq) means the splitting of existing
matter that generates new things and new forms of life, while being is their taking shape. Based on his translations and analysis, Galadari therefore concludes that there is no Scriptural support for Creationist ontology and cosmology, the origins of which lies elsewhere, in the realm of polemics between religion and science.

Given the importance of contemporary Creationism for debates about religion and science, two other contributors deal specifically with the phenomenon. Taner Edis compares two countries, the USA and Turkey, focusing on how conservative religious constituencies since the 1990s have successfully challenged state programs for science education in schools, and raised public distrust of ‘scientific expertise’ in general. Their success is partly due to global economics and politics: privatization of education and democratization has empowered local communities to assert their interests against state education policy. Yet the real threat posed by Creationism is not scientific, Edis argues. The natural sciences that depend on evolution theory recruit students at the level of higher education and are not necessarily affected by Creationism in schools. Rather, the threat is of a political nature. The religious conservative constituencies associated with Creationism selectively reject scientific expertise, which in turn reduces the power of the political liberals to shape politics through their claim to scientific evidence-based policies. Martin Riexinger’s contribution concentrates on Turkish Creationism, tracing it from the founder of the Nurcu movement Said Nursi (c. 1875–1960), via the conservative-religious nationalists of the 1980s, to today’s famous producer of Creationism school books, Harun Yahya (aka Adnan Oktar). By analysing writings by the contemporary Nurcu author Halit Ertugrul, who also works in the state Department of Education, Riexinger shows how belief in divine creation in the Nurcu context is linked to a critique of communist materialism and its claim to explain reality and society through science. Faith in divine creation represents respect for the authority of parents, teachers, and religious leaders, which is the precondition for learning and thus also for science. This anti-communist critique dates back to Said Nursi himself and provides an interesting political parallel to American Creationism. Turkey joined NATO in 1952 and entered into the global alliance against communism – yet another illustration of the relationship between ontology and politics.

In another country-study, Mahdi Esfahani examines the religious motivations and hermeneutics that underpin science policy and scientific output in post-revolutionary Iran. He identifies four positions regarding the relationship between Islam, the Qur’an, and modern sciences: Technocrats, Historicists, Selectivists, and Purists. All four positions favour a strong science
policy, and all agree that Islam and the Qur’an encourage human pursuit of scientific knowledge. However, they differ on two issues. Firstly, whether they premise the legitimacy of science on its presumed correspondence with the Qur’an, or whether they perceive it to be legitimate regardless of such correspondences. Secondly, whether the humanistic ‘a-religious’ philosophies are considered legitimate pursuits or only the sciences and technology, since the latter do not explicitly challenge religious worldviews in the way the Humanities and Social sciences do, with their ‘inner-worldly’ explanations of religion. As Esfahani’s analysis shows, these simultaneously religious and scientific positions also have political implications, regarding Iran’s relations with the international community.

The final contribution to this perspective, and to the whole collection, is Lyric Banerjee’s exposition of the establishment of modern science museums in India, and the role of religion. Reminding the reader of the connection in Europe between the development of modern sciences and religious and social reform, Banerjee appoints ‘the Bengal Renaissance’ 1815–1919 and the religious and social reformation movements associated with it as the prelude to modern science and science museums in India. She selects Rammohan Roy (1774–1833) as the intellectual starting point, which would inform the later reform movements, such as Brahmo Samaj. Specifically, Roy identified priest- and caste-centred Indian religion as an important part of the social obstacles to national development and independence from British colonial rule. Instead, he promoted theistic Brahmo religion, based on the Vedic Upanishads’ notion of ontological unity and One divinity (Brahman) behind the manifold deities and figurative statues and images, perceiving this form of Indian theism as unrelated to the social problems of hierarchies and segmentation, and therefore compatible with science and national development. Thus, Banerjee explores in the Indian context a connection between the ontology of divine Oneness and the modern movements, which aimed at progress and national sovereignty, partly through science and education. She then traces the development of science museums, and science policy in post-colonial India as related to the museums.

Conclusion

I conclude this introductory essay by referring the last contribution back to the beginning: Peter Beyer’s model of the modern transformation and globalisation of the function systems. The trajectory that Banerjee sketches illustrates the intersection between function systems –
religion, science, and politics – and highlights the significance of ontology. She also shows how the Vedic sources are mobilised as ontological resources, which enable thinkers to bypass perceived ‘problematic’ local religion, social mores, and politics, while remaining authentically Indian. Banerjee’s approach and case study opens a new perspective on al-Abbassi’s study of Qur’anic and Islamic ‘rationalisation’ of the cosmos through the doctrine of theistic One-ness: certainly, the Qur’an and early Islam underpinned the Arabs’ creation of a new nation and polity, sovereign in relation to the regional imperial powers. Perhaps, then, as de Certeau argued, the study of doctrine is crucial for historical analysis of religion and its relationship with science. More controversially put, considering current tensions between Theology and Religious studies: without the study of theology and doctrine, Religious studies and History of Religions will lose a key analytical tool.

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