

RESEARCH ARTICLE

Globalizing ‘science and religion’: examples from the late Ottoman Empire

M. Alper Yalçinkaya*

TED University, Ankara, Turkey

*Corresponding author: M. Alper Yalçinkaya, Email: alper.yalcinkaya@tedu.edu.tr

Abstract

This article brings together insights from efforts to develop a global history of science and recent historical and sociological studies on the relations between science and religion. Using the case of the late Ottoman Empire as an example, it argues that ‘science and religion’ can be seen as a debate that travelled globally in the nineteenth century, generating new conceptualizations of both science and religion in many parts of the world. In their efforts to counter arguments that represented Islam as the enemy of science and progress, young Ottoman intellectuals wrote many texts addressing a specific European author, or an imagined, broad European audience in the mid- to late nineteenth century. These texts described a ‘science-friendly’ Islam of which not only Europeans but also ‘ignorant Muslims’ were unaware. Using examples from the Ottoman press, the article demonstrates how this effort involved separating Islam from the lived reality of Muslims, transforming the religion essentially into a text that referred to scientific facts or that instructed adherents to appreciate science. In their contributions to the debate on science and religion, these young intellectuals thus also defined themselves as the legitimate interpreters of Islam in the ‘age of science’.

Among the transformations that the historiography of science has undergone in recent periods, the growth in efforts to develop a global history of science has been uniquely inspiring. These efforts have not only generated studies that challenge the dominance of Eurocentric narratives on the histories of particular sciences, but also problematized some of the basic concepts of the field, including ‘Science’ with a capital S itself.¹ A parallel development in historiography concerns the new approaches to the question of ‘science and religion’ that have been emerging since the 1990s. These approaches have replaced the simplistic conflict narrative that had dominated historical and social scientific accounts for decades with more nuanced analyses.² Not only have comparative studies also started to emerge in this sub-field, but challenges to the unitary and trans-historical concept of ‘science’ have also been generated within it, just as in the case of

¹ For programmatic statements see, among others, Fa-ti Fan, ‘The global turn in the history of science’, *East Asian Science, Technology and Society: An International Journal* (2012) 6, pp. 249–58; Sujit Sivasundaram, ‘Sciences and the global: on methods, questions, and theory’, *Isis* (2010) 101, pp. 146–58.

² Among the most recent examples are Jeff Hardin, Ronald L. Numbers and Ronald A. Binzley (eds.), *The Warfare between Science and Religion: The Idea That Wouldn't Die*, Baltimore: Johns Hopkins University Press, 2018; Bernard Lightman (ed.), *Rethinking History, Science, and Religion: An Exploration of Conflict and the Complexity Principle*, Pittsburgh: University of Pittsburgh Press, 2019.

the global history of science.³ In this article, I elaborate on the connections between the literatures on ‘science and religion’ and on the global history of science, using the late nineteenth-century Ottoman Empire as example. I argue that the ‘science-and-religion’ debate travelled globally in the nineteenth century and contributed to the emergence of particular conceptualizations of both science and religion in many parts of the world. In the specific case of the Ottoman Empire, contributing to the science-and-religion debate by writing on the relations between Islam and science became a key way for Muslim Ottomans to defend Islam and the Ottoman Empire. But this endeavour also pushed Muslim intellectuals to construct a ‘de-cultured’, abstract Islam, treated as distinct from the beliefs and practices of Muslims. Objectifying religion in this way was not an entirely new phenomenon for Muslims, but participating in the global debate on ‘science and religion’ generated new contours around the category of ‘Islam’.

The Ottomans in the history of science and ‘science and religion’

As a rather small but growing sub-field, the study of the history of science in the Ottoman Empire has been adopting approaches befitting a global historiography of science. Challenging the conceptualization of ‘Islamic science’ as a static and monolithic tradition, insisting on the significance of cross-cultural encounters, and focusing on ‘connected histories’ and the diverse networks of knowledge production in the Ottoman world have been particularly effective approaches.⁴ In a similar vein, Harun Küçük’s recent analysis situated Ottoman ‘practical naturalism’ within the context of the aftermath of the global price revolution of the sixteenth century, rather than linking it to ‘Ottoman’ or ‘Islamic’ culture.⁵

Worth noting, however, is that for studies of the nineteenth-century Ottoman world, discursive changes acquire additional significance, since it was in this period that the Ottomans were compelled to comment on notions such as the uniqueness and universality of modern science and the merits of different systems of knowledge production and beliefs – notions that became prevalent in this era of colonial projects and print capitalism.⁶ While historians of science rightly problematize totalistic and ahistorical concepts like ‘Science’, ‘Islamic science’, or ‘European science’, these concepts gradually became actors’ categories and issues of public debate around the world by the late nineteenth century.⁷ As early as 1872, Ahmed Midhat Efendi (1844–1912) dwelt on the inconsistent usage of Ottoman Turkish words to talk about science.⁸ The word *kagaku* was coined in Japan in 1871 as the equivalent of ‘science’ and became popular only after the late

³ For the best example of this perspective see Peter Harrison, *Territories of Science and Religion*, Chicago: The University of Chicago Press, 2015.

⁴ Sonja Brentjes, ‘The prison of categories: “decline” and its company’, in Felicitas Opwis and David Reisman (eds.), *Islamic Philosophy, Science, Culture, and Religion*, Leiden: Brill, 2012, pp. 131–56; Sonja Brentjes, *Travellers from Europe in the Ottoman and Safavid Empires, 16th–17th Centuries: Seeking, Transforming, Discarding Knowledge*, Farnham: Ashgate, 2010; Jane Murphy, ‘Aḥmad al-Damanhūrī (1689–1778) and the utility of expertise in early modern Ottoman Egypt’, *Osiris* (2010) 25, pp. 85–103.

⁵ Harun Küçük, *Science without Leisure: Practical Naturalism in Istanbul, 1660–1732*, Pittsburgh: University of Pittsburgh Press, 2019.

⁶ For studies that touch or focus on nineteenth-century debates on science in the Ottoman world see, among others, Daniel Stolz, *The Lighthouse and the Observatory: Islam, Science, and Empire in Late Ottoman Egypt*, Cambridge: Cambridge University Press, 2018; Marwa Elshakry, *Reading Darwin in Arabic, 1860–1950*, Chicago: The University of Chicago Press, 2013; M. Alper Yalçınkaya, *Learned Patriots: Debating Science, State, and Society in the Nineteenth-Century Ottoman Empire*, Chicago: The University of Chicago Press, 2015.

⁷ On the development of the notion of ‘Western science’ see Marwa Elshakry, ‘When science became Western: historiographical reflections’, *Isis* (2010) 101, pp. 98–109.

⁸ Ahmed Midhat, ‘İlm ile Fen’, *Dağarcık* (1288/1872) 1, pp. 26–9.

1880s, while the Chinese adoption of this word as *kexue* acquired common usage only in the early twentieth century.⁹

It was not only the category ‘science’ that became a global topic of debate in the late nineteenth century. The construction of ‘religion’ as a coherent system of beliefs and practices, versions of which could be found in all societies, initially became a component of European intellectual discourse in the same period. Indeed, the birth and popularity of the ‘conflict thesis’ in Europe and the US, and the emergence of taxonomic studies of ‘world religions’, are concurrent and connected developments: John W. Draper’s *History of the Conflict between Religion and Science* was published in 1874, Max Müller’s *Introduction to the Science of Religion* in 1873. But once again, defining, classifying and comparing religions in terms of their relations with science swiftly acquired a truly global character. Just as Ahmed Midhat was translating John W. Draper’s work into Ottoman Turkish to make a case for Islam’s overall superiority to Christianity, the Sri Lankan reformer Anagarika Dharmapala (1864–1933) was representing Buddhism as a world religion in harmony with science in his speech at the World’s Parliament of Religions held in Chicago in 1893.¹⁰ While Syed Ahmad Khan (1817–98) was writing on how Islam could be interpreted in a way that would be in harmony with science in colonial India, the Shinto priest Aoiyama Nobuchiku (1836?–1909) was claiming that neither Christian nor Buddhist beliefs could match the Shinto account of creation in terms of their harmony with the theory of evolution.¹¹ Thus what Sivasundaram suggests in the case of the British Empire can be generalized: a global history of science is a global history of science and religion for the post-eighteenth-century world.¹²

A number of complex, related and at times contradictory developments brought about what can be called the co-construction of science and religion – e.g. the rise of scientism and professional science in Europe, the emergence of an approach to religion as an object to be studied scientifically, and the portrayal of European scientific progress as the epitome of civilization and the lack of such progress as barbarism, likely caused by superstitious beliefs which could be identified by the science of religion and needed to be remedied from without. But these ideas did not simply operate around the world as ideas; they appeared in the form of colonial projects, legal and institutional impositions and missionary endeavours. Local responses to these ideas were shaped by such manifestations as these and the whole array of contemporaneous domestic transformations: while the balance of power was highly skewed, colonial discourses and projects did not determine the shape and dynamics of local struggles about the meanings and locations of ‘science’ and ‘religion’.

The construction of ‘world religions’ within such struggles in this period has been studied effectively in cases such as India, China and Japan. These studies explore the assemblage of ideas and practices from a variety of traditions in such a way as to construct (both discursively and practically) religions that could be governed and compared to Christianity – processes sometimes referred to as the ‘invention’ of Hinduism, Shintoism

⁹ Shen Guowei, ‘Yan Fu’s role’, in Jing Tsu and Benjamin A. Elman (eds.), *Science and Technology in Modern China, 1880s–1940s*, Leiden: Brill, 2014, pp. 93–114, 97–100.

¹⁰ M. Alper Yalçinkaya, ‘Science as an ally of religion: a Muslim appropriation of “the conflict thesis”’, *BJHS* (2011) 44, pp. 161–81; David L. McMahan, *The Making of Buddhist Modernism*, Oxford: Oxford University Press, 2008.

¹¹ Irfan Habib, ‘Reconciling science with Islam in 19th century India’, *Contributions to Indian Sociology* (2000) 34, pp. 63–92; Clinton Godart, *Darwin, Dharma, and the Divine: Evolutionary Theory and Religion in Modern Japan*, Honolulu: University of Hawaii Press, 2017, pp. 23–5.

¹² Sajit Sivasundaram, ‘A global history of science and religion’, in Thomas Dixon, Geoffrey Cantor and Stephen Pumfrey (eds.), *Science and Religion: New Historical Perspectives*, Cambridge: Cambridge University Press, 2010, pp. 177–97.

or Buddhism.¹³ The case of Islam, however, is somewhat different, since the category *din*, commonly translated into English as ‘religion’, was already present in the Qur’an. There exists a limited literature questioning the extent to which the Islamic notion of *din* can be seen as a synonym of ‘religion’.¹⁴ However, in a meticulous recent study, Rushain Abbasi illustrated that premodern Muslims’ conceptualization of *din* indeed had several aspects that were rather comparable to the modern idea of ‘religion’ that studies on the ‘invention of world religions’ attribute to the age of colonialism. Premodern Muslims ‘functionaliz[ed] religion as an object of politics’ and used their monotheistic schema to study the ‘Other’ that they encountered or ruled over, in ways reminiscent of European colonialist narratives.¹⁵ These findings indicate a significant need for more nuance in studies of Islam within the literature on the processes of ‘construction of religion’, and more caution when linking these processes to modernity. However, as Abbasi also argues, what make the modern era unique are the ‘social, political, and intellectual developments which have radically transformed the conceptual contours and functional purposes of religion’.¹⁶

Among these ‘intellectual developments’, the debate on science and religion can be seen as a pivotal one, as the case of the Ottoman world illustrates. Within a context that witnessed the emergence of new types of expertise, as well as growing concerns regarding political and economic collapse, Muslim Ottoman intellectuals also confronted European representations of Islam as a religion that hindered scientific progress. In turn, they proposed alternative representations of Islam as a religion that, in reality, supported science and civilization; through these representations they also contributed to the emerging global discourse that tended to rank world religions in terms of their amenability to scientific progress and civilization. Texts about ‘science and Islam’ were not only responses to colonialist narratives, however, but products of the social and cultural changes within the Ottoman Empire, particularly in the composition and balances of power within the intellectual field.¹⁷

Islams without bodies

Put most basically, Muslim Ottoman authors’ efforts to represent Islam as a religion in harmony with science involved positing a strict distinction between religion and the religious. After all, if Islam was to be characterized as ‘pro-science’ while Muslim societies

¹³ Jason Ānanda Josephson, *The Invention of Religion in Japan*, Chicago: The University of Chicago Press, 2012; Rebecca Nedostup, *Superstitious Regimes: Religion and the Politics of Chinese Modernity*, Cambridge, MA: Harvard University Press, 2009; Jason Ānanda Josephson, ‘When Buddhism became a “religion”: religion and superstition in the writings of Inoue Enryō’, *Japanese Journal of Religious Studies* (2006) 33, pp. 143–68; Tomoko Masuzawa, *The Invention of World Religions: Or, How European Universalism Was Preserved in the Language of Pluralism*, Chicago: The University of Chicago Press, 2005; Timothy Fitzgerald, *The Ideology of Religious Studies*, Oxford: Oxford University Press, 2000. For a study on the comparison of Hinduism with Islam during colonial rule see Peter Gottschalk, *Religion, Science, and Empire: Classifying Hinduism and Islam in British India*, New York: Oxford University Press, 2013.

¹⁴ Wilfred Cantwell Smith, *The Meaning and End of Religion*, Minneapolis: Fortress Press, 1963; Yvonne Y. Haddad, ‘The conception of the term *din* in the Qur’an’, *Muslim World* (1974) 64, pp. 114–23; Talal Asad, *Genealogies of Religion: Discipline and Reasons of Power in Christianity and Islam*, Baltimore: Johns Hopkins University Press, 1993.

¹⁵ Rushain Abbasi, ‘Islam and the invention of religion: a study of medieval Muslim discourses on *din*’, *Studia Islamica* (2021) 116, pp. 1–106, 102.

¹⁶ Abbasi, op. cit. (15), p. 103.

¹⁷ Yalçinkaya, op. cit. (10), refers to these changes as well, but focuses primarily on domestic political concerns due to which the Ottoman sultan Abdülhamid II gave support to authors of texts demonstrating that Islam and science were in harmony.

lagged behind Christians in scientific progress, then existing Muslim societies could not truly represent Islam. This type of argument was voiced in the nineteenth-century Ottoman press increasingly by a group that represented the shift in the Ottoman intellectual field: students and graduates of the new, relatively secular high schools and academies (colloquially referred to as the *mekteb*), who sought to distinguish themselves from the ‘men of the *medrese*’, graduates of the schools that produced the religious elite (the *ulema*).¹⁸ Within the former group were autodidacts and young bureaucrats who had lived and worked in Europe as well. Composed of men who not only were readers of French novels, newspapers and popular-science magazines, but also had received at least some religious education, these literati contended to become the new ‘knowledge class’, and did this through the press which blossomed after the 1860s.¹⁹ In the newspapers and literature of the era, references to ‘ignorant imams’ became progressively more common as these figures came to define precisely what Islam was not. Islam needed new representatives who truly understood what it instructed.

A piece entitled ‘Comparison of religion and reason’ published in the *Basiret*, an influential newspaper of the 1870s, is an early manifestation of this approach. The author, Hayreddin Bey, a convert, noted that the anti-clerical attitudes common in France would never be seen in Ottoman lands, yet for Islam to have the influence it deserved to have in the contemporary world, ‘knowledgeable, virtuous and wise teachers, preachers, and *medrese* instructors’ were essential. Referring to a piece in a French newspaper published in Istanbul that ridiculed a cleric who allegedly argued that Muslims should not use silverware like Europeans did, Hayreddin argued that such attitudes would imply that Muslims should not use modern weaponry either, even though the prophet had instructed them to acquire perfection in all areas.²⁰ Another piece complained that Ottoman schools, unlike those in Europe, failed to teach the ‘sciences necessary for industry’, and that Christian schools within the empire were of much higher quality. Following a long discussion on Arab scholars’ contributions to science, the author noted,

We know of teachers who spent twenty years of their lives in the *medrese*, yet are not familiar even with the four rules of the mathematical sciences ... Poor [*medrese*] students labour for days to comprehend the meaning of a few lines [and gain very little out of their effort]. In the meantime, a student in a well-organized *mekteb* studies so many topics and issues within a few days ... If the natural sciences are ignored because they are [seen as] unnecessary, then why did Arab scholars ... make so much effort in these sciences?²¹

In the 1880s, texts criticizing numerous aspects of the *medrese* system almost constituted a genre of their own, with prominent authors contributing. A striking example was published in the pages of the popular newspaper *Tercüman-ı Hakikat*, where the author Samipaşazade Abdülbaki proclaimed that science was about uncovering the laws established by God and using this knowledge to pursue the well-being of one’s self, one’s family and humanity at large. This necessitated not only hard work but also innovation, yet the *medrese* insisted on ignoring the new sciences and produced people who were entirely dependent on the state for subsistence. Laypeople fared worse: ‘If being a Muslim had

¹⁸ See Benjamin Fortna, ‘Islamic morality in late Ottoman “secular” schools’, *International Journal of Middle East Studies* (2000) 3, pp. 369–93, on the need to underline that this was but a ‘relative’ secularism.

¹⁹ On these changes see Amit Bein, *Ottoman Ulema, Turkish Republic: Agents of Change and Guardians of Tradition*, Stanford, CA: Stanford University Press, 2011; Selçuk Akşin Somel, *The Modernization of Public Education in the Ottoman Empire, 1839–1908: Islamization, Autocracy, and Discipline*, Leiden: Brill, 2001.

²⁰ Hayreddin, ‘Muvazene-i Din ü Ak!’, *Basiret*, 29 Kanunusani 1286 (10 February 1871), pp. 2–3.

²¹ Untitled, *Basiret*, 22 Zilkade 1289 (21 January 1873), p. 3.

been nothing but praying, fasting and not straying one bit from the way Adam lived, there would have remained no Islamic government, no Ottoman state, not even a single Muslim on earth.' Note Abdülbaki's condemnation of ordinary understandings of Islam as daily life and basic ritual; neither the Muslim public at large, nor the existing Islamic elite, truly grasped the principles that constituted Islam – principles the new elite would rediscover and revive:

What is most peculiar is that there is not a single word in the religion of Christianity uttered to encourage learning ... yet the members of this religion now live in contentment, blessed with civilized learning. [Meanwhile, Islam] is based exclusively on the principles of learning, justice, knowledge and science, yet the members of such an exalted religion are among the most ignorant, impoverished and rapidly declining peoples of the world.²²

A letter sent to the newspaper *Tercüman-ı Hakikat* is also illustrative of how the 'men of science' represented the ideal 'man of religion' and, implicitly, themselves. Written by several students of the Imperial School for Medicine, arguably the leader among Ottoman institutions of higher education in terms of its science curriculum, the letter proclaimed that religion, as the only source of moral values, was indispensable for Ottoman society. Yet Islam also instructed the cultivation of science: 'Every Muslim nation is required by religion to believe and surrender fully to divine orders, and strive to increase their glory and wealth through the acquisition of the sciences and arts, thus ensuring the well-being of the nation and the protection of the eminence and grandeur of Islam.'²³ Consequently, the letter argued, Muslim preachers should compose their sermons 'in such a way as to encourage the acquisition of the sciences and the arts'. Many preachers focused exclusively on topics like the wrath of God and the afterlife, which deterred believers from engaging in worldly activities, the letter argued. What the Ottoman Empire needed was men of religion who would teach the misguided that Islam instructed the acquisition of science and that as the sciences 'progress even further, it will become clear that they amount to the wisdom of Islam itself.'²⁴

While not a direct condemnation of the *medrese*, the argument that even Christian schools were preferable options for Muslims was also common, albeit controversial, in this era. On 15 November 1880, a woman by the name of Fahriye, a student at the American College for Girls in Istanbul, published a letter bemoaning the state of Muslim schools. To counter criticism that it was not 'permissible for a girl who is a student at an American school to dispute matters pertaining to Muslim schools', her sister Cemaliye published a response stating that the American school would teach them science, not religion. Moreover, learning about Christianity should not be an issue, since it was ignorance, not learning, 'that corrupt[ed] and weaken[ed] faith'.²⁵ In this respect, even students at an American school could be perceived as not only more knowledgeable but also more soundly religious than the products of the *medrese*.

The 'men of the *medrese*' did not stay silent in the face of such condemnations. As early as 1873, they noted in a letter to the *Basiret* that while they appreciated the need for the sciences of the times, *medrese* instructors were already underpaid and overworked, and

²² Samipaşazade Abdülbaki, 'Maarif, *Tercüman-ı Hakikat*, 3 Zilhicce 1298 (27 October 1881), pp. 2–3.

²³ 'Mekteb-i Tıbbiye-i Şahane talebesinden birkaç zat imzalarıyla matbaamıza tebliğ olunan varakanın aynısıdır', *Tercüman-ı Hakikat*, 13 Ramazan 1298 (9 August 1881), pp. 2–3.

²⁴ Abdülbaki, op. cit. (22).

²⁵ Cemaliye Hanım, 'Varaka', *Tercüman-ı Hakikat*, 3 Safer 1298 (5 January 1881), p. 3. Worth noting is the availability of this option to female Muslim students, unlike the *medreses*.

could not be expected to contribute more than they already did.²⁶ Abdülbaki's polemic eight years later received a similar response; the *ulema* not only underlined the sacrifices they had been making, but asserted that the types of knowledge they imparted were also functional: 'What unites nations and peoples in harmony is religion, and what sustains religion is religious knowledge. Religion invites people to betterment and salvation, and prevents them from the contemptible, hence the wise of the world never stray from religion.' Furthermore, religious learning not only praised but ordered the religious to engage in the 'mathematical and natural sciences'. These sciences were already taught in the new schools opened by the government, so Abdülbaki's criticism boiled down to an attack on religious studies, the *ulema* wrote.²⁷

Nevertheless, even in their disavowal, such letters reveal a basic convergence underneath the apparent difference of opinion – science and religion as separate entities, Islam as a religion that supported science, and practical function as the criterion for the worth of any institution or person. By the 1880s, such views had become 'common sense' in the discursive space of the press increasingly dominated by voices representing 'new knowledge'. Note also the consistent references to non-Muslims in these texts – the world of the late nineteenth century was one in which the harmony between Islam and science had to be demonstrated to non-Muslims with whom Muslim Ottomans were in competition, be they within the Ottoman Empire or in Europe.

'Islam': A text promoting science

While the idea that commoners were less capable than elites of understanding sophisticated matters was by no means alien to Islamic or Ottoman thought, in the nineteenth century the opposing view gained popularity: members of the *ulema* were not necessarily better than commoners at understanding and representing the unique qualities of Islam. The qualities that the new literati identified not only drew a boundary between themselves and both the commoners and the 'unproductive' products of the *medrese*, but also responded to real or imagined European critics as well.²⁸ In response to the prevalent depiction of Islam as a 'backward' religion in late nineteenth-century Europe, Muslim Ottoman intellectuals further developed the notion of a disembodied Islam: Islam was the Qur'an, a text. And among its fundamental qualities was its endorsement of science and productive labour in accordance with scientific principles.

The result can be likened to an intellectual purge – a plethora of condemnations of misinterpretations and misapplications, not only in the present but also in the past. *Israiliyat*, an exegetical tradition of referring to the Old and the New Testament in the interpretation of Qur'anic verses, became one of the most prominent targets in this context. In a discussion of how the Qur'an encouraged Muslims to study astronomy, for instance, the popular author and publisher Ahmed Midhat stated that some early Muslim exegetes had introduced into Islam 'the mistaken ideas of the Jews about the heavens', such as the idea of the heavens as the abode of God. A careful reading of the Qur'an, however, would find no contradiction between the verses and scientific findings.²⁹ In a couplet, the journalist and poet Ibrahim Şinasi wrote that he would not buy 'decrepit

²⁶ 'Varaka', *Basiret*, 14 Zilhicce 1289 (12 February 1873), p. 2.

²⁷ 'Redd-i Batıl ve Isbat-ı Hak', *Tercüman-ı Hakikat*, 14 Zilhicce 1298 (7 November 1881), pp. 2–3.

²⁸ Islam as the main cause of the backwardness of Muslim peoples was the dominant, but not the only, representation in European texts of the nineteenth century. See Zachary Lockman, *Contending Visions of the Middle East: The History and Politics of Orientalism*, Cambridge: Cambridge University Press, 2009; Clinton Bennett, *Victorian Images of Islam*, London: Grey Seal, 1992.

²⁹ Ahmed Midhat, 'Sema II', *Tercüman-ı Hakikat*, 24 Rebiulevvel 1301 (23 January 1884), p. 3.

Jewish beliefs' in this age of 'fresh knowledge'.³⁰ Hence even earlier Muslim scholars had made mistakes; it was time to discover the 'true' Qur'an.³¹

Responses to the remarks of European intellectuals and politicians on the question of 'Islam and science' (or 'Islam and civilization') appeared frequently in Ottoman newspapers. No matter if these responses were intended to praise or condemn such remarks, their authors inevitably needed to explain, directly or indirectly, what 'Islam' meant from their perspective. These descriptions of Islam were presented to the local audience, but concern with non-Ottoman audiences was also always in the background of the texts, rendering them contributions to a global debate. An article published in the *Vakit* newspaper in 1879, for instance, introduced the topic directly by noting that Europeans were becoming increasingly aware of the contributions Muslims had made to civilization. While these contributions were obvious to Muslims, the article argued that the reasons behind them still needed to be clarified, and offered a strictly doctrinal explanation. The Bible made it clear that Christianity was not focused on this-worldly activity, which had led Christians to ignore the legacy of the Greeks; Islam, on the other hand, taught its adherents not to ignore this world while prioritizing the afterlife, and thus early Muslims had rapidly advanced in the sciences and the arts. The prophet's instruction to seek knowledge even if it was in foreign lands had also guided Muslims, thanks to which a 'freedom of conscience and proclivity for progress' with no equal had emerged. Not confining learning to matters of faith and morality, Muslims had laid the foundations of all contemporary natural and mathematical sciences. The roots of this tree of learning that Muslims had grown were still present in the Ottoman world, indicating that all that the Ottomans needed to return to their former glory in the sciences and arts was time.³²

The portrayal of Islam as comprising a simple doctrine supported by the sayings of the prophet that promoted the acquisition of knowledge (i.e. 'the sciences') and hard work (i.e. 'the arts') remained a common strategy during the late nineteenth century, always indicating simultaneously that Muslims had for a period of time ignored these 'true' principles of Islam. A significant incident in 1883 gave a further boost to these characterizations: Ernest Renan, French historian and one of the founders of comparative religion, delivered a well-known speech in which he asserted that Qur'anic doctrine, which purportedly ruled both the spiritual and the temporal realms, had led to hostility toward science among Muslims.³³ Renan's speech was tremendously provocative to the many Muslim readers who were keen observers of the French intellectual scene and led to a series of well-studied responses.³⁴ Existing studies on the responses to Renan, particularly those in Turkish, tend to analyse it primarily as an example of orientalist rhetoric, however, and underemphasize its location within the global debate about the very categories of 'religion' and 'science'. Illustrating the latter issue is a lesser-known reaction to Renan

³⁰ Şinasi, *Müntehabat-ı Eş'arım*, 2nd edn, İstanbul: Tasvir-i Efkâr, 1870 (first published 1862), p. 84.

³¹ On the elimination of *İsrailiyat* in contemporary commentaries on the Qur'an see Roberto Tottoli, *Biblical Prophets in the Qur'an and Muslim Literature*, New York: Routledge, 2002. This radical reversal in attitudes toward *İsrailiyat* damaged the traditionally taken-for-granted connection between Islam and the other Abrahamic religions to a significant extent, according to İsmail Kara in "'Unuttuklarını Hatırla": Şerh ve Haşiye Meselesine Dair Birkaç Not', *Dîvân: Disiplinlerarası Çalışmalar Dergisi* (2010) 28, pp. 1–67, 63.

³² Anonymous, 'İslamiyet ve Medeniyet', *Vakit*, 12 March 1878, p. 3.

³³ Ernest Renan, 'Islamism and science', in Bryan Turner (ed.), *Readings in Orientalism*, London: Routledge, 2000 (first published 1883), pp. 199–217.

³⁴ On Renan and the responses to his speech see Düccane Cündioğlu, 'Ernest Renan ve "reddiyeler" bağlamında İslâm-bilim tartışmalarına bibliyografik bir katkı', *Dîvân: Disiplinlerarası Çalışmalar Dergisi* (1996) 2, pp. 1–94; B. Harun Küçük, 'Islam, Christianity and the conflict thesis', in Thomas Dixon, Geoffrey Cantor and Stephen Pumphrey (eds.), *Science and Religion: New Historical Perspectives*, Cambridge: Cambridge University Press, 2010, pp. 111–30; Nikki R. Keddie, *An Islamic Response to Imperialism: Political and Religious Writings of Sayyid Jamal ad-Din 'al-Afghani'*, Berkeley: University of California Press, 1983.

which concerns that of not a Muslim, but a French author named Charles Mismser. In the late 1860s, Mismser had become the editorial writer of the semi-official French newspaper *La Turquie* in Istanbul, and also served as private secretary to Fuad Pasha and Âli Pasha, the leading Ottoman statesmen of the 1860s.³⁵ Mismser's response in turn provoked further commentary from Muslim authors – an interchange that thus exemplifies the circular process through which 'Islam' became an entity that both European and Muslim commentators compared to another entity called science within a global debate.

Mismser, who was philosophically affiliated with the positivist movement in France, published his response in Emile Littré's journal *La philosophie positive* immediately after Renan's speech in May 1883. Noting immediately that remarks like Renan's would put France in a difficult position at a time when so many Muslims lived under French authority, Mismser underlined that remarks on science and Islam had a political significance, an argument that Muslim authors also made frequently in this period. Substantially, Mismser argued that the 'inferiority' of Muslim peoples was due only 'to the much faster development of other nations, better endowed in terms of capital and tools, less exposed to foreign covetousness, and supported in their upward march by three centuries of scientific preparation'.³⁶ According to Mismser, while Muslims might appear inferior, in many respects Islam was superior to Christianity. The doctrine of Islam, most specifically the idea of one and only one God, was much more logical and straightforward than that of the Trinity. The 'vague doctrine' of Christ had led to the emergence of countless implausible commentaries as well as social conflict, while Mohammed's teachings had re-established order as well as tolerance.³⁷ The civilization of Islam had directly emerged from the 'precepts of the Qur'an' and remained powerful for a thousand years, while the Christian civilization had emerged only a thousand years after the birth of the religion, thus demonstrating the merits of Qur'anic doctrine: 'By becoming scholars, Christians cease to be Christians. By becoming ignorant, Muslims cease to be Muslims', Mismser noted, adding that, in the contemporary era, Muslims needed a regeneration through science, which in itself would be in accordance with the instructions of the Qur'an.³⁸

Mismser's essay was immediately reproduced in *La Turquie*.³⁹ Soon afterwards, the Ottoman newspaper *Vakit* published a brief summary of Mismser's points, which led Ahmed Midhat, the most prolific and popular Muslim Ottoman author and publisher of the leading newspaper of the time, to enter into the discussion with two pieces published on 30 May and 1 June 1883 – only two months after Renan's speech. Remarkably, however, Midhat confessed immediately that he had read neither any of Renan's earlier works nor the infamous speech. Hence his comments were based entirely on Mismser's remarks, as well as on his own familiarity with the discourse on the 'hostility of Islam to science'. In any event, Midhat noted, the apparent flimsiness of Renan's arguments suggested that his views were based not on rigorous research but on a 'raging enmity to Islam'.⁴⁰ Renan, in this case, was but an incarnation of a common anti-Islamic tendency within Christianity. Furthermore, Midhat suggested, this tendency had only got more pronounced among Christians in recent decades as Christian doctrine had virtually been abandoned in Europe in the age of science. While Christianity could still offer some

³⁵ François Georgeon, 'Un positiviste en orient au XIXe siècle: Charles Mismser, la Turquie et l'Islam', in *Des ottomans aux turcs: Naissance d'une nation*, Istanbul: Isis, 1995, pp. 125–58.

³⁶ Charles Mismser, 'L'Islamisme et la science', *La philosophie positive* (1883) 30, pp. 437–54, 445.

³⁷ Mismser, op. cit. (36), p. 452.

³⁸ Mismser, op. cit. (36), p. 453.

³⁹ On 20–21 and 22 May 1883.

⁴⁰ Ahmed Midhat, 'İslamiyet ve Fünûn', *Tercüman-ı Hakikat*, 30 May 1883, p. 2.

moral values to humanity, Islam reigned supreme both as a moral guide and as a promoter of science, Midhat concluded.⁴¹

How did Islam promote scientific research, then? Midhat's approach to the question was particularly creative, in that he argued that references to natural phenomena in the Qur'an could be interpreted as a hint that these phenomena should be studied by humans. These hints were commonly quite explicit. For instance, Qur'anic verses instructing man to gaze at the stars could not be interpreted in any other way than an encouragement of their scientific study: 'What could be the benefit in looking at the sky with a casual glance?' Midhat asked.⁴² Similarly, citing verse 12:109 of the Qur'an, 'So have they not travelled through the earth and observed how was the end of those before them?' – which, in the context of the *surah*, is a condemnation of those who deny that Muhammad was the messenger of God – Midhat argued that Muslims could find in this verse a call to study history, geography, archaeology and ethnography. To understand what happened to ancient peoples, one needed to travel and understand geography; to understand the ways of the people in question one needed to study ethnography, but as these peoples were extinct, one needed to study their material remains, for which archaeology was essential. Similarly, as opposed to Christianity, which 'utterly despised' topics pertaining to political economy, the Qur'an stated, 'And that there is not for man except that [good] for which he strives' (53:39), thus underlining the value of one's labour, as well as 'And do not make your hand [as] chained to your neck or extend it completely and [thereby] become blamed and insolvent' (29:12), thus encouraging earning, saving, charity and the appreciation of the value of goods. Hence the basis of the science of political economy could also be found in the Qur'an. Ultimately, morality itself was an object of science, which was also obviously rooted in the Qur'an: in contrast to Christianity, which unreasonably instructed believers to 'turn the other cheek', the Qur'an endorsed values that would make one neither too meek nor too proud and violent. In its moderate and reasonable approach to moral values, Islam put forth the fundamentals of morality as a field of scholarship.⁴³

Just like any text on the harmony between Islam and science, Midhat's response to Renan also had to discuss the historical 'decline' of science in Muslim societies. Midhat agreed that this had occurred, and that it was true that there had been Muslims in history who had been dismissive toward the sciences. However, he was clear that 'such unusual and exceptional cases' could not be used against Islam.⁴⁴

That some Muslims exhibit indifference to the sciences cannot by any means be the basis of an objection to the essence of the religion of Islam. Indeed, we do say that 'The book of God is sufficient for us'. But what we mean by that is that the book of God is sufficient for us if and only if we truly understand the explicit and implicit precepts it includes. And this type of understanding is possible only through affiliating with the sciences.⁴⁵

Due to insufficient awareness of science or the insufficient development of some sciences, Midhat acknowledged that some Muslims may have occasionally misinterpreted verses. These had, however, been much less damaging to Islam than the violence between Protestants and Catholics had been to Christianity. Rather than predicting the collapse of Islam, Renan and others like him should worry about the growth of 'anti-clerical'

⁴¹ Midhat, op. cit. (40).

⁴² Ahmed Midhat, 'İslamiyet ve Fünûn', *Tercüman-ı Hakikat*, 1 June 1883, p. 2.

⁴³ Midhat, op. cit. (40), p. 2.

⁴⁴ Midhat, op. cit. (40), p. 2.

⁴⁵ Midhat, op. cit. (42), p. 2.

(the term used in the original) movements in their own country, Midhat proclaimed, hence, once again, demonstrating his awareness of the political and cultural significance of the religion-and-science debate, even though his familiarity with what Renan had actually said was very limited.⁴⁶

Midhat thus presented what Ottoman Muslims needed to do in the form of a cycle: a better understanding of the Qur'an would once again enable Muslims to comprehend the divine obligation to pursue science, and advancing in the sciences would enable them to interpret the Qur'an more accurately. Expressing for this reason his complete approval of Mismar's remark that a more religious Muslim should also be more pro-science, while the opposite held true for Christians, Midhat directed his readers to pay attention to the Qur'anic verse 'And no grain is there within the darknesses of the earth and no moist or dry [thing] but that it is [written] in a clear record' (6:59). Of the various interpretations of the term 'clear record' (*kitâbın mübîn*) in exegetical traditions, Midhat chose the one that interprets it as the Qur'an, thus presenting Islam as the principles and truths put forth in the Holy Book, whether or not understood or practised adequately by Muslims.

It is important to note that while Midhat himself would repeatedly assert during his career that this did not mean that the Qur'an should be seen as a compendium of scientific facts, this identity set between Islam and the text of the Qur'an, and the burden on the text to be 'pro-science', promptly gave rise to what is known as the 'scientific exegesis' approach in Qur'anic studies.⁴⁷ The relegation of an expertise derived from *medrese* education in favor of a scientific or practical expertise generated myriad efforts to find in the Qur'an references to matters that only those educated in the sciences could identify.

One final example may suffice to clarify how the two late nineteenth-century trends identified in this article – the perceived need to respond to European commentators and the 'rescue' of Islam from living Muslims, including members of the *ulema*, via its reduction to a text – converged. An essay by Said Bey that appeared in *Zevra*, a newspaper published in Baghdad by the Ottoman state, noted that the debate about Islam and science was of vast political significance. Asserting that 'public opinion' mattered tremendously in the contemporary world, Said argued that European politicians made arguments about science and religion when they wanted to cause harm to other nations. 'If all Europeans are convinced that Muslims reject the sciences, and the contemporary civilization which is a product of the sciences, due to religion, then they will not only fail to trust and respect us, but will look at us with disdain', which would in effect mean a wholesale ostracization of Muslims.⁴⁸ However, Muslims could not put the blame entirely on the agendas of European politicians, as such perceptions were also facilitated by the 'ubiquity of the uneducated among us, which is in contradiction to our religion'. After observing 'people stuck in superstitious beliefs all across our country' during their travels to the Ottoman Empire, European merchants and travellers disseminated views that 'corroborate[d] the publications of the ill-intentioned'. That there were Muslims who opposed all ideas that came from Christian lands was undeniable, but Islam could not be at fault for such misguidedness, as the instructions of the prophet and the Qur'an only encouraged Muslims to acquire knowledge, regardless of its source. Hence European critics, including those like Renan, could easily be refuted, but Muslims also needed to eradicate

⁴⁶ Renan was neither a proponent of radical scientism nor, as Ahmed Midhat thought, a Christian zealot. See Robert D. Priest, *The Gospel According to Renan: Reading, Writing, and Religion in Nineteenth-Century France*, New York: Oxford University Press, 2015. To Renan, the Gospel of Jesus was not dogmatic in any respect, as opposed to the religion constructed by Mohammed.

⁴⁷ Zafar Ishaq Ansari, 'Scientific exegesis of the Qur'an', *Journal of Qur'anic Studies* (2001) 3, pp. 91–104; Stolz, op. cit. (6), pp. 200–4.

⁴⁸ Said, 'İslamiyet ve Fünûn', reproduced in *Tercüman-ı Hakikat*, 6 Şevval 1300 (10 August 1883), p. 2.

the mistaken beliefs existing among them. In other words, Islam as the correct interpretation of the Qur'an needed to replace Islam as the lived reality and tacit knowledge of Muslims.

Conclusion

In their analyses of how culture operates, sociologists draw attention to the difference between 'settled' and 'unsettled' times. During settled times, established habits and practical routines remain authoritative, and culture functions essentially as the taken-for-granted background of action. In unsettled times where rapid social change takes place, these patterns are found wanting, and 'cultural entrepreneurs' build new meaning systems in a conscious and explicit manner.⁴⁹ The ways in which late nineteenth-century texts portray 'Islam' indicate a similar transformation, whereby young Muslim intellectuals constructed the notion of Islam as a basic system of principles that could be found in the text of the Qur'an. This transformation was, among other factors, an outcome of a strategy deployed within intra-elite competition for intellectual status, and a by-product of the intensely felt need to defend Islam, and the Ottoman Empire, during a period in which 'European public opinion' mattered greatly.

To repeat, the latter was not simply an adoption of the terms of the adversary; the non-Muslim allies that Muslim authors found in their quest to defend (and define) Islam used a similar approach in their works. Among the many responses to Renan, for instance, was an essay on the intellectual and scientific achievements of Arabs published in the newspaper *Saadet* which used as evidence Gustave Le Bon's *La civilization des arabes*.⁵⁰ In this work, Le Bon defined Islam as the first religion to have introduced monotheism in the world. Uniting its clear and simple doctrine with an emphasis on charity and justice, Islam had been uniquely successful at converting and civilizing people. Most importantly, in addition to its remarkable ability to enhance morality, Islam was, among the religions of the world, 'one of the most compatible with scientific discoveries'. In its original form, Buddhism had been superior to all Semitic religions in this respect, but its current versions were certainly inferior to Islam.⁵¹

Separating Islam as doctrine from the beliefs and practices of Muslims, the new intellectuals thus not only appeared to comment on religion on an equal footing with members of the *ulema*, the formally recognized representatives of Islamic authority, but also offered a response to Europeans using their own perspective, illustrating the making of the local within an unequal global context.⁵² Also worth underlining, however, is the emphasis of the new intellectuals on Islam as a religion that not only praised scientific inquiry, but encouraged practical action – action which the new sciences themselves would enable. Hence this was an Islam designed for the age of global industrial capitalism. It is no surprise that authors like Ahmed Midhat and Namık Kemal (the author of another well-known response to Renan), who spilled much ink to demonstrate the harmony between Islam and science, also wrote profusely on the importance of hard work, material

⁴⁹ Ann Swidler, 'Culture in action: Symbols and strategies', *American Sociological Review* (1986) 51, pp. 273–86; Bart Bonikowski, 'Nationalism in settled times', *Annual Review of Sociology* (2016) 42, pp. 427–49.

⁵⁰ Anonymous, 'Arablar', *Saadet*, 12 Rebiulevvel 1302 (30 December 1884), pp. 2–3.

⁵¹ Gustave Le Bon, *La Civilization des Arabes*, vols. 1 and 2, Paris: Firmin-Didot, 1884, p. 104. Also see Yalçınkaya, op. cit. (10), on Ahmed Midhat's transformation of John William Draper into an ally.

⁵² Note again that many among the new intellectuals had received some religious education in public institutions or from tutors. They could also be conversant with Sufi ideas and practices. It would be more accurate to see them as new claimants to authority in matters pertaining to religion than as adversaries of the *medrese*, or men alienated from religion.

growth and the nature of modern economies.⁵³ Stating that Islam was not just a religion about the supernatural, or a collection of basic moral tenets, was particularly important to intellectuals who became the voices of the socio-economic transformation that the empire was going through.

The link between science and industry (and industriousness) is also significant due to the question concerning the other term in 'Islam and science'. The fluidity of the way 'science' was defined in late nineteenth-century Ottoman texts is a topic discussed by several works, but it is worth stressing for the purposes of this article that texts on 'Islam and science' used a variety of characterizations, none of which excluded the 'new' sciences associated with Europe such as geology or biology. While one may find texts that referred only to the natural sciences, or texts (such as Midhat's) that counted both morality and the animal world as objects of science, or those that also referred to 'religious sciences', those texts that depicted Islam (i.e. the Qur'an 'correctly' interpreted) as in harmony with science consistently included the 'new sciences of Europe'.⁵⁴ Furthermore, even though the types of scholarship associated with the *medrese*, such as *hadith* (sayings of the prophet), *fiqh* (Islamic jurisprudence) or *tafsir* (Qur'anic commentary), could be praised in a text, the emphasis on productivity and the transformation of scientific knowledge into material progress commonly served as a reference to the modern sciences.⁵⁵ This line of reasoning introduced an additional layer to the narrative on the harmony between Islam and science, by characterizing the Qur'an as a text on the importance of hard work. Ultimately, arguments about the harmony between Islam and science were constructions of 'Islam' and 'science' for not just domestic, but also global, consumption. Beneath each construction was a depiction of the present, and the potential future, of the Ottoman Empire in a changing world.

These depictions remained alive and well throughout the twentieth century, even though the early Republican era (1923–1938) is usually associated with the dominance of a scientific attitude and with antagonism toward the public role of Islam. Atatürk's famous sayings representing science as the only true guide in life, or asserting that the Turkish nation would abandon the 'lax mentalities of the past' and march 'with the torch of positive science in hand', are significant in this context.⁵⁶ As Şükrü Hanioglu

⁵³ See, for instance, Namık Kemal, 'Terakki', *İbret*, 14 Tesrinievvel 1288 (26 October 1872), pp. 1–2; Kemal, 'İbret', *İbret*, 5 Haziran 1288 (17 June 1872), pp. 1–2; Kemal, 'Sinaat ve ticaretimiz', *İbret*, 8 Teşrinisani 1288 (20 November 1872), pp. 1–2; Kemal, 'Sa'y', *Cüzdân*, Zilhicce 1289 (February 1873), pp. 2–5; Ahmed Midhat, *İktisat Metinleri* (ed. Erdogan Erbay), Konya: Cizgi, 2005. For a detailed analysis of late nineteenth-century Ottoman debates about how to generate a 'capitalist spirit' among Muslims see Deniz Kilincoglu, *Economics and Capitalism in the Ottoman Empire*, New York: Routledge, 2015.

⁵⁴ On the issue of terminology see Samer Akkash (ed.), *İlm: Science, Religion, and Art in Islam*, Adelaide: Adelaide University Press, 2019; M. Alper Yalçinkaya, *Learned Patriots: Debating Science, State, and Society in the Nineteenth-Century Ottoman Empire*, Chicago: The University of Chicago Press, 2015; Kenan Tekin, 'Reforming categories of science and religion in the late Ottoman Empire', unpublished PhD dissertation, Columbia University, 2016. An important study of the blurry boundaries among these terms in late Ottoman texts, with numerous examples of how Ottoman authors themselves were aware of the inconsistent uses of the terms, is İsmail Kara, 'Modernleşme dönemi Türkiye'sinde "ulüm," "fünûn" ve "sanat" kavramlarının algılanışı üzerine birkaç not', in Kara, *Din ve Modernleşme Arasında: Çağdaş Türk Düşüncesinin Meseleleri*, İstanbul: Dergah, 2003, pp. 75–109.

⁵⁵ Note that these texts referred primarily to the situation in nineteenth-century İstanbul and to what the authors saw as the center of the Ottoman realms. Courses on astronomy, medicine and mathematics had commonly been part of *medrese* curricula primarily before the eighteenth century, and the association between the *medrese* and strictly traditional Islamic scholarship was a relatively novel phenomenon. On this as well as the dynamic ways in which branches of knowledge had been defined in Muslim societies see Jane Murphy, 'Islamic knowledge systems: circulation, rationality, and politics', in Armando Salvatore (ed.), *The Wiley Blackwell History of Islam*, Hoboken, NJ: Wiley Blackwell, 2018, pp. 479–98.

⁵⁶ See www.ktb.gov.tr/TR-96294/10-yil-nutku.html (accessed 19 January 2022), my translation.

notes, in Atatürk's vision, 'nationalism sanctified by science ... would reign supreme as the new religion'.⁵⁷ Textbooks published in this period also exhibit this approach.⁵⁸ Nevertheless, not only did references to the 'essential rationality' of Islam and the need to separate 'true Islam' from superstition remain common in this period, but they also continued to be brought up regularly by Kemalists decades after the early years of the Republic.⁵⁹ Particularly during the early Cold War era, Turkish conservatives further developed the idea of Islam as a religion in harmony with science, this time underlining that the materialistic currents of the past were no longer dominant, and asserted that Islam offered the perfect combination of moral values and the endorsement of scientific research, with references to Ahmed Midhat's writings as well.⁶⁰ The representation of Islam as a religion that promoted scientific research *and* hard work would also become the norm in school textbooks in later decades, particularly after the coup of 1980.⁶¹ While the arguments of Ahmed Midhat and others were products of a particular social and economic context, the construction and instrumentalization of Islam as a religion for the modern, technocratic, capitalist world remained appealing among Turks for whom 'Muslim' was (and continues to be) an important marker of identity and cultural praxis.

Acknowledgements. I am very grateful to Sahar Bazzaz and Jane Murphy for initiating this project and for their valuable feedback and support throughout the process. I have also benefited much from the incisive comments of the anonymous referees of the *BJHS*, as well as the recommendations of Kenan Tekin.

⁵⁷ M. Şükrü Hanioğlu, *Atatürk: An Intellectual Biography*, Princeton, NJ: Princeton University Press, 2017, p. 230.

⁵⁸ Sam Kaplan, "'Religious nationalism": a textbook case from Turkey', *Comparative Studies of South Asia, Africa and the Middle East* (2005) 25, pp. 665–76.

⁵⁹ Umut Azak, *Islam and Secularism in Turkey: Kemalism, Religion and the Nation State*, London: I.B. Tauris, pp. 14, 80–7.

⁶⁰ Alper Yalçinkaya, 'The "harmony thesis" in the Turkish media, 1950–1970', in Bernard Lightman (ed.), *Rethinking History, Science, and Religion: An Exploration of Conflict and the Complexity Principle*, Pittsburgh: University of Pittsburgh Press, 2019, pp. 129–44.

⁶¹ Kaplan op. cit. (58).

Cite this article: Yalçinkaya MA (2022). Globalizing 'science and religion': examples from the late Ottoman Empire. *The British Journal for the History of Science* 1–14. <https://doi.org/10.1017/S0007087422000292>