Faraday Papers

# Religion and the Rise of Science

Peter Harrison

**Summary**
There is a common view that historical relations between science and religion have been hostile and that religion is essentially inhospitable to science. This paper contests that view, identifying ways in which religion played a positive role in the emergence of modern science. It shows how religious considerations not only motivated key scientific figures, but also provided the core philosophical presuppositions of science, informed its methods and content, and was the source of values that lent it social legitimacy.

There is a common view that the historical relations between science and religion have been frosty at best. According to some popular accounts, tensions between Galileo and the Catholic Church, and more recent religiously motivated rejections of evolutionary theory, are typical of a recurring pattern of conflict. For several decades now, however, historians of science have been painstakingly chipping away at the conflict thesis (as it is known in the trade), and the result of their labours is a far more complex and nuanced picture of science-religion relations.[1] An important part of this story is the positive role played by religion in the rise of science. In various ways, religious considerations provided the motivation to pursue science, provided its core philosophical presuppositions, informed its methods and content, and lent it social legitimacy.

Before examining these positive contributions in more detail it is worth saying a little more about 'the rise of science'. Usually, this phrase refers to 'the scientific revolution', an event that took place in Europe over the course of the sixteenth and seventeenth centuries. This is generally taken as the period during which modern science first developed and became a major enterprise. It is convenient to date the beginning of this protracted revolution to 1543, when two revolutionary scientific works were published: *De Humani Corporis Fabrica* by the anatomist Andreas Vesalius, and *De Revolutionibus* by the astronomer Nicolaus Copernicus. The conventional end-point is 1687, the year in which Newton published his *Principia Mathematica*.[2] However, it must also be acknowledged that there was science (or something like it) well before this, and in places other than Europe. The ancient Greeks, the Chinese, the Indians, medieval Muslims, Christians and Jews all engaged in quite sophisticated scientific endeavours. It can also be argued that there were various indigenous sciences and technologies. So it is important to establish at the outset what, if anything, was distinctive about the scientific culture that arose in early modern Europe.

An important part of this story is the positive role played by religion in the rise of science.

If we were to ask this question of those now regarded as pioneers of the new science they would point to ways in which what they were doing represented a break from traditional approaches to nature that were grounded in classical models, and in particular the approach of the Greek philosopher Aristotle (384-

1 From an extensive literature see John Hedley Brooke, *Science and Religion: Some Historical Perspectives* (Cambridge: Cambridge University Press, 1991, 2014); David C. Lindberg and Ronald L. Numbers (eds.), *When Science and Christianity Meet* (Chicago: University of Chicago Press, 2003); Bernard Lightman (ed.), *Rethinking History, Science and Religion* (Pisttsburgh: University of Pittsburgh Press, 2019).

2 Peter Harrison, 'Was there a Scientific Revolution?', *European Review* 15 (2007), 445-457. For two contrasting views of the scientific revolution see Steven Shapin, *The Scientific Revolution* (Chicago: University of Chicago Press, 1996) and David Wooton, *The Invention of Science: A New History of the Scientific Revolution* (New York: HarperCollins, 2015).

322 BC). From the thirteen century onwards an Aristotelian approach to science had been central to the university curriculum. Importantly, this approach had been given the imprimatur of ecclesiastical authorities and to some extent had been incorporated into the teachings of the Church. Scientific innovators in the early modern period self-consciously repudiated this Aristotelian approach. Indeed, some saw themselves as reformers of science who were following the precedent set by the Protestant reformers. As to what was different, the new sciences were experimental and practical in orientation. They aimed at improving the human lot, rather than being exercises in philosophical contemplation. At a theoretical level, instead of seeking out the essences of things, they focused on mathematical laws. In terms of their organisation, they relied upon the collective endeavours of many individuals, and stressed the importance of accumulating knowledge over time. Virtually all of this was new.

Just as important as these new methods and approaches was the status of the natural sciences. In Europe, from the seventeenth century onwards, we witness a unique pattern of development in which science is propelled into the centre of society and comes to assume a position of cultural dominance. Science becomes the model for knowledge acquisition. Again, this is quite new. What we tend to see in other times and places is that science is simply one cultural enterprise among others and often far from the most important. While there may have been periods of scientific efflorescence, these tended to have a limited life span. Previous scientific cultures thus exhibit what might be called a 'boom-bust' pattern, with scientific activity waxing and waning. That pattern is broken for the first time with the rise of science in the early modern West. This second feature of modern Western science—its consolidation into a central and permanent feature of the culture—is particularly important for understanding the role of religion, because what has to be explained is not only how modern science came to take on its characteristic methods and approaches, but also how it gained social legitimacy: how, in other words, it came to be thought of as an activity worth pursuing in the first place. As we will see, religious factors played an important role not only in the birth of modern science, but also in its consolidation and growth.[3]

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What follows is necessarily a rather truncated account, but I will briefly consider ways in which three features of modern science—laws of nature, mathematical and mechanical models, and experimental method—are indebted to religious considerations. I will then turn to questions of the consolidation of science, and show how religion provided both the motivation to pursue science and also some of the core values that helped secure it a central place in modern societies.

## 1. Laws of Nature

The prevailing view in Europe, up until the seventeenth century, was that nature was ordered according to the intrinsic properties of natural things. Objects in the natural world have essences and inherent goal-directed tendencies that governed their behaviours. In the seventeenth century, this view was gradually displaced by the idea that nature was governed by laws that were imposed upon it by God. French philosopher René Descartes (1596-1650) pioneered the idea of physical laws of nature, arguing that God had set the world in motion at the moment of creation and that he continued to move things in accordance with laws that he had freely chosen. For Descartes, the motions of natural objects were not to be explained in terms of any intrinsic qualities, but rather by the force of God's will continually exerting itself according to fixed laws. These laws, Descartes contended, were everlasting and unchanging because God himself was eternal and immutable.[4]

Descartes' idea of laws of nature quickly caught on, and leading scientific figures of the seventeenth century understood their mission as discovering the laws that God had chosen to impose on nature.[5] Robert Boyle, one of the leading experimental philosophers of the period, wrote that the laws of motion 'did *not* necessarily spring from the nature of matter, but depended on the will of the divine author of things.'[6] The preface to the second edition of Isaac Newton's masterwork, the *Principia* (1687, 1713), expressed a similar sentiment. The business of true philosophy (i.e. science), it announced, is to discover the laws that 'the Great Creator' chose to impose upon his creation.[7]

The specific theological impulse for this shift was a renewed emphasis, most conspicuous in the theology of

3 On the issue of legitimacy of modern science, and contrasting 'boom-bust' patterns, see Stephen Gaukroger, *The Emergence of a Scientific Culture: Science and the Shaping of Modernity* (Oxford: Oxford University Press, 2005), esp. ch. 1.

4 Descartes, *Principles of Philosophy*, §61, in The Philosophical writings of Descartes [CSM] tr. John Cottingham, Robert Stoothoff, Dugald Murdoch, and Anthony Kenny, 3 vols., (Cambridge: Cambridge University Press, 1984-91), vol. 1, p. 240.

5 John Henry, 'Metaphysics and the Origins of Modern Science: Descartes and the Importance of Laws of Nature', *Early Science and Medicine* 9 (2004), 73-114; Peter Harrison, 'Laws of Nature in Seventeenth-Century England: From Cambridge Platonism to Newtonianism', in Eric Watkins (ed.), *The Divine Order, the Human Order, and the Order of Nature: Historical Perspectives* (New York: Oxford University Press, 2013), pp. 127-48.

6 Robert Boyle, *The Christian Virtuoso, in Works of the Honourable Robert Boyle,* 6 vols. edited Thomas Birch (Hildesheim: Georg Olms, 1966), vol. 5, p. 521.

7 *Isaac Newton's Mathematical Principles of Natural Philosophy and his System of the World*, tr. Andrew Motte, ed. Florian Cajori (Berkeley: University of California Press, 1960), p. xxvii.

the Protestant reformers, on the sovereignty of God and the primacy of the divine will. When applied to the natural world, this principle led to an erosion of the intrinsic efficacy of natural objects, and a corresponding increase in the role played by God in directly bringing about events in the natural world. While these tendencies were by no means restricted to Protestant thinkers, they bear an interesting analogy to the doctrines of justification articulated by the reformers, who stressed the primacy of divine grace and drastically diminished the significance of human virtues and inner qualities. In both spheres, that of nature and of grace, it was now God's eternal decrees, rather than the interior qualities of the creatures, that determined the relevant outcomes.

It is worth noting at this juncture that while the specific concept of laws of nature is essentially a seventeenth-century idea, the reformers' emphasis on the omnipotence of God had been long in the making. In 1277, the Bishop of Paris had issued a Condemnation of some 217 philosophical and theological theses taught, or at least discussed, in the Faculty of Arts at the University of Paris. Many of these related Aristotelian doctrines, and some have constructed this episode as yet another instance of 'science-religion' conflict. But a fundamental premise of the document was that God's power was not to be limited by the strictures of Aristotelian science. It was argued, for example, that God could, if he so chose, create a vacuum—something that Aristotle had mistakenly insisted was impossible. It turns out that the ultimate consequence of these condemnations was to liberate thirteenth-century natural philosophers from a slavish adherence to scientific teachings of Aristotle, and think of nature's operations in terms of the actions of an omnipotent Deity. Some historians have gone so far as to suggest that the Condemnation of 1277 inspired the birth of modern science.[8] Less controversially, we might say that the history of science is complicated, and that conflicts sometimes have surprising and unintended consequences.

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## 2. Mathematics, Mechanics, and Atoms

Directly related to the early modern idea of laws of nature was the increasingly prominent role played by mathematics and mechanics in scientific explanation. Medieval thinkers had certainly relied upon mathematics in areas such as optics, astronomy, and kinematics. However, these disciplines were typically regarded as something less than genuine science (or 'natural philosophy' as it was then known), since they did not provide causal explanations of the relevant phenomena. While it was acknowledged that mathematic models could provide a good basis for predictions—for example, of the positions of heavenly bodies—it was not thought to follow from this that they were necessarily true. Mathematical models were often regarded as useful fictions that 'saved the appearances'.

This issue was one of the factors contributing to Galileo's notorious collision with the Inquisition in the early seventeenth century. Catholic authorities took the line that while astronomical models, such as the Coperncian model, might have the virtue of offering accurate predictions, it did not necessarily follow that the model directly matched reality. The Copernican model was, in any case, very difficult to square with the prevailing physics and observational data seemed to count against the motion of the earth. If the earth was revolving around the sun, it should have been possible to detect slight changes in the relative positions of the stars. However, for various complicated reasons, stellar parallax was not observed until 1838. Similarly, if the earth was rotating on its axis, this should have been evident in the motion of projectiles fired perpendicular to the equator. Again, though, the 'Coriolis Effect' was not measured until the eighteenth century. Conclusive evidence supporting the earth's diurnal rotation had to await the legendary experiment of Jean Bernard Léon Foucault, who in 1851 suspended a 67m swinging pendulum from the dome of the Paris Pantheon. But in all of this, and in spite of both countervailing evidence and the existence of a number of competing, observationally equivalent theories, Galileo insisted that the sun-centred model was more than a mere device for calculation, and that it represented the actual physical arrangement of the heavens.

The official Catholic position had its own theological justification: God could have brought about the appearances that we see in the heavens by any number of physical arrangements, and it would be presumptuous for human minds to claim to know with certainty how it was done.[9] Again, then, the idea of divine omnipotence played a key role in scientific controversy, in this instance being wielded against a dogmatic insistence on the truth of one specific hypothesis (albeit one that turned out to be on the right track). Advocates of the new mathematical astronomy countered with a theological argument of their own. They argued that God had stamped mathematical relations onto the natural order and that these mathematical relations were not simply human constructions. This was the point of Galileo's famous insistence that 'the book of nature' had been written by God 'in the language of mathematics'.[10] Other pioneers of the new astronomy agreed. Johannes

8 French historian and philosopher Pierre Duhem championed this view. See Edward Grant, 'The Condemnation of 1277, God's Absolute Power, and Physical Thought in the Late Middle Ages', *Viator*, 10 (1979), 211–44.

9 Galileo, *Dialogue concerning the Two Chief World Systems*, tr. Stillman Drake, 2nd edn. (Berkeley: University of California Press, 1967), p. 464.

10 Galileo, *The Assayer in Discoveries and Opinions*, tr. Stillman Drake (New York: Doubleday, 1957), pp. 237-238.

Kepler (1571-1630), who made the crucial discovery of three laws of planetary motion, maintained that God had used eternal mathematical archetypes when he created the world. It was on this basis that Kepler rejected the traditional Aristotelian prejudice against the mathematisation of nature: 'the reason why the mathematicals are the cause of natural things (a theory which Aristotle carped at in so many places) is that God the Creator had Mathematicals with him as archetypes from eternity in their simplest divine state of abstraction.' [11] Newton, who incorporated Kepler's laws into his theory of universal gravitation, wrote that the universe was inhabited by an 'infinite and omnipresent spirit' in which matter was moved by 'mathematical laws.'[12] Claims such as these were often supported by the biblical reference—one of Augustine's favourites—that God had 'ordered all things in measure and number and weight' (Wisdom of Solomon 11.20).[13]

At the same time, nature was increasingly thought of as analogous to a machine, rather than a self-organised and goal-directed living thing. Aristotle had taught that there was a clear distinction between the natural and artificial. Artificial things such as machines, on this principle, could not serve as models for nature. However, a direct implication of the Christian doctrine of creation was that the world, in an important sense, was an artificial creation. (Aristotle although a theist of a kind, believed in the eternity of the world, and hence did not have a doctrine of creation.) Those arguing for a mechanical world view thus had an important theological justification for their position. God made the world, and therefore it was analogous to an artifact. This also led to an important shift in how 'final causes' were understood. Whereas once they had been understood as the inherent tendencies of natural objects to behave in goal-directed ways, now final causes were reinterpreted as God's designs. The idea that nature showed evidence of divine wisdom and power thus became more prominent as a justification for studying the natural world.

It was common to encounter the criticism that experimental sciences were useless, and, further, that the practical goals at which they aimed were undignified and unworthy.

Finally, linked to each of these developments was the revival of the ancient, Epicurean theory of matter, according to which natural things can ultimately be reduced to uniform, microscopic particles. Given a Christian gloss this view, which stressed the inertness of the fundamental particles of matter, allowed a much greater role for divine activity, since nothing in nature could happen without some external motivating force. That force, in the newly baptised Epicureanism, was God. As Descartes summed it up: 'God alone is the author of all the motions in the world'.[14] Again, then, this new matter theory was consistent with a God who directly exercised sovereignty in the natural world.

## 3. Reformed Anthropology and Experimental Method

Yet another aspect of Aristotelian thought that had insinuated itself into medieval thinking about knowledge of nature was the Greek philosopher's sanguine view of the capacities of human reason and of the reliability of the senses. As is well known, for Aristotle human beings were 'rational animals' and he placed considerable store in human rationality. He also held that our senses provide us with more or less reliable information about the world. For its part, nature is comprehensible to human minds. What follows from these assumptions is that science can be grounded in commonsense generalisations made on the basis of direct observations—without, crucially, the need for experiments and instruments. According to Aristotelian science, then, a heavy object (the stone) will always fall more quickly than the light one (the feather); terrestrial objects move in straight lines and will eventually come to rest; celestial objects move perpetually in circular paths; and so on. This is what our unaided senses seem to tell us.

Protestant reformers Martin Luther and John Calvin were far less optimistic about the prospects of an easy knowledge of nature, both on account of the fallen condition of human minds and senses, and because the world itself had deteriorated since its original creation. Luther thus remarked that 'it is impossible that nature could be understood by human reason after the fall of Adam.' For Luther, Aristotle's science was built upon the false foundation that 'natural light or intellect and heathen philosophy are safe means of discovering truth.'[15] John Calvin also proposed that human beings were totally depraved, by which he meant that depravation extended to all human faculties, including the means by which we acquire knowledge.[16] Both reformers thought that their medieval predecessors had too easily accommodated themselves to the position of Aristotle, and that accordingly they had underestimated the epistemic consequences of human sin.

While Luther and Calvin were not particularly interested in applying these ideas to the sciences, others were. What followed was the development of the far more critical approach to the study of nature known as experimental natural philosophy. One of the basic assumptions of the

11 Johannes Kepler, *Mysterium Cosmographicum*, tr. A. M. Duncan (Norwalk, CT.: Abaris, 1999), p. 125, n. 2.

12 Isaac Newton, Draft corollary to Proposition 6 of the *Principia*, qu. in John Brooke, 'The God of Isaac Newton', in John Fauvel, et al. (eds.), *Let Newton Be*, (Oxford: Oxford University Press, 1990), p. 172.

13 See, e.g., Descartes to Mersenne, CSM, vol. 3, pp. 23, 358f., *The World*, § 47, CSM vol. 1, p. 97.

14 René Descartes, *The World*, CSM vol. 1, p. 96.

15 Martin Luther, *Sermons of Martin Luther*, 7 vols., ed. and tr. John N. Lenker et. al. (Grand Rapids: Baker Books, 2000), vol. 1, pp. 329, 344.

16 John Calvin, *Commentary on Genesis*, 3.6, *Calvin's Commentaries*, 22 vols., (Grand Rapids: Baker Books, 1984). Vol. 1, p. 154; *Institutes of the Christian Religion,* II.ii.12, 2 vols., ed. John McNeill, tr. F. Battles (Philadelphia: Westminster, 1960), vol. 1, p. 271.

new experimentalism was that gaining knowledge of the natural world would be a significant challenge, given the sinful condition of human beings and the fact that a fallen nature was resistant to investigation. What was now called for were repeated sets of painstaking observations, conducted under experimental conditions. As for fallen human senses, these now had to be augmented through the use of artificial instruments such as the telescope and microscope. Whereas in the past scientific knowledge could be attained by the wise few, now it was understood to call for the labours of many individuals carried out over long periods of time. Science would necessarily be corporate and cumulative.[17]

In his influential plan for a new kind of science, Francis Bacon (1561-1626) could thus propose as one of his chief aims the restoration of the connection between the human mind and the natural world 'to its perfect and original condition.'[18] Realising that there was a problem to begin with was a key starting assumption for the new science. This is what Aristotle, who knew nothing of the Fall, was unable to have taken into consideration. As for the specifics of how that partial restoration might be accomplished, this is where the merits of the experimental approach came to the fore. Summing up his justifications for the new experimental method, Robert Hooke (1635-1703), the first curator of experiments at the Royal Society, observed that 'every man, both from a derived corruption, innate and born with him, and from his breeding and converse with men, is very subject to slip into all sorts of errors.' Hooke went on to point out the implications: 'These being the dangers in the process of humane reason, the remedies of them all can only proceed from the real, the mechanical, the experimental philosophy.'[19] Experimental science, in other words, came to be understood as a partial remedy for the baleful effects of original sin.

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## 4. Consolidating Science

In addition to its distinctive methods and metaphysical underpinnings, modern science enjoys a privileged social status and has become an enduring and central feature of Western cultures. That status also owes something to religious considerations. It is tempting to think that the high regard in which the natural sciences are typically held is owing to their obvious explanatory power and their utility. However, neither of these features was conspicuous in the seventeenth century when the successes of science were limited and when utility and practical usefulness were not as highly valued as they are now. It was common to encounter the criticism that experimental sciences were useless and, further, that the practical goals at which they aimed were undignified and unworthy.[20] Faced with these criticisms, advocates of the new scientific approaches appealed to religious considerations to establish the social legitimacy of science.

One way in which this was accomplished was to argue that studying nature was religiously edifying, and that the pursuit of science was a genuinely religious vocation. Johannes Kepler, for example, had wanted to become a theologian but eventually came to the realisation that 'God is also praised through my work in astronomy.'[21] For Kepler, the whole world was the 'the temple of God' and hence to study nature was 'to honour God, to venerate him, to wonder at him.'[22] Robert Boyle also contended that the world was the 'temple' of God and that those who studied it were 'priests of nature'.[23] Contemplating the natural world he described as 'the first act of religion' and 'philosophical worship of God'.[24]

In particular, a renewed emphasis on the detecting of divine design in the natural world lent both natural history and natural philosophy an additional theological respectability. Natural theology thus offered a safe theological context for the pursuit of science, as well as providing a medium for its broader communication.[25] It was also argued, on similar grounds, that the sciences contributed to moral and religious formation. These moral and religious justifications were to persist well into the nineteenth century. The

17 For an extended treatment of this argument see Peter Harrison, *The Fall of Man and the Foundations of Science* (Cambridge: Cambridge University Press, 2007).

18 Francis Bacon, *The Great Instauration*, in *The Works of Francis Bacon*, 14 vols., ed. James Spedding, Robert Ellis, and Douglas Heath (London: Longman, 1857–74), vol. 4, p. 7.

19 Robert Hooke, *Micrographia* (London, 1665), Preface.

20 For attacks on the new sciences see Barbara M. Benedict, *Curiosity: A Cultural History of Early Modern Inquiry* (Chicago: University of Chicago Press, 2001), pp. 46–51; Stephen Gaukroger, 'Science, Religion and Modernity', *Critical Quarterly* 47 (2005), 1–31; R. H. Syfret, 'Some Early Critics of the Royal Society', *Notes and Records of the Royal Society of London* 8 (1950), 20–64.

21 Johannes Kepler, *Gesammelte Werke* (Munich, 1937–45), vol. 13, p. 40. For Kepler's own account, see Kepler, *Selbstzeugnisse*, ed. Franz Hammer, trans. Esther Hammer (Stuttgart-Bad Constatt, 1971), pp. 61–65.

22 Johannes Kepler, *Mysterium Cosmographicum*, p. 53.

23 Robert Boyle, *Some Considerations Touching the Usefulness of Experimental Natural Philosophy*, in *The Works of the Honourable Robert Boyle*, 6 vols., ed. Thomas Birch (Hildesheim: Georg Olms, 1966) vol. 2, p. 31. For an account of Boyle's notion of the priest-scientist see H. Fisch, 'The Scientist as Priest: A Note on Robert Boyle's Natural Theology', *Isis* 44 (1953), 252–65; Peter Harrison, 'Sentiments of Devotion and Experimental Philosophy in Seventeenth-Century England', *Journal of Medieval and Early Modern Studies* 44 (2014), 113-133.

24 Boyle, *Usefulness of Natural Philosophy*, in Works, vol. 2, pp. 62f.

25 Robert M. Young, 'Natural Theology, Victorian Periodicals, and the Fragmentation of a Common Context', in *Darwin's Metaphor: Nature's Place in Victorian Culture* (Cambridge: Cambridge University Press, 1985), pp. 126–63.

astronomer John Herschel wrote in his influential *Preliminary Discourse to the Study of Natural Philosophy* (1830) that the natural philosopher 'is led to the conception of a Power and Intelligence superior to his own, and adequate to the production and maintenance of all that he sees in nature.' This was not a cold theoretical intellectual calculation, moreover. Herschel reckoned that the formal study of nature served 'to tranquilise and re-assure the mind, and render it less accessible to repining, selfish, and turbulent emotions.'[26] It was thus not uncommon to maintain that the ultimate end of scientific study was moral edification. As geologist George Fairholme wrote in 1833, the 'great end of the study of Geology ought to be, a *moral* rather than a *scientific* one.'[27]

Another powerful source of religious legitimation for the natural sciences came through Francis Bacon's insistence that science was the means by which the human race could recapture a God-given dominion over nature that had been lost at the Fall. Like many of his contemporaries, Bacon held that in the original state of creation Adam and Eve had enjoyed an encyclopaedic knowledge of nature. Both this knowledge, and the mastery of nature that it had enabled, had been lost as a consequence of the Fall. Bacon maintained that just as religion provided a means of ameliorating some of the moral losses occasioned by the Fall, so the new sciences would assist in a regaining of our lost dominion over nature. In the closing lines of his ambitious manifesto for a renewed science, *A New Organon* (1620), Bacon wrote: 'For man by the fall fell at the same time from this state of innocency and from his dominion over creation. Both of these losses however can even in this life be in some part repaired; the former by religion and faith, the latter by arts and sciences.'[28] Over the course of the seventeenth century the idea that science was a redemptive exercise that would help counter the losses occasioned by the Fall provided it with a powerful source of religious legitimacy.

## 5. Conclusion

In due course, the benefits that the sciences provide came to be understood as worthwhile in their own terms and without the original theological underpinnings. Scientific practices were also divorced from the moral and theological imperatives that had been important during their extended formative period. Much of this change took place over the course of the nineteenth century, when we also see laws of nature reinterpreted as brute features of the world that just happen to be there, awaiting discovery. The secularisation of the sciences has thus tended to colour our readings of the past, obscuring the theological and religious influences that shaped the methods of the sciences and lent them social legitimacy.

There were, of course, factors other than the religious ones considered here that played important roles in the origins of modern science. Explaining any major historical development requires multiple explanations including reference to material factors. In the case of the emergence of the modern sciences we can point to mechanical innovations, the voyages of discovery, the rise of print culture, new scientific societies and correspondence networks, and the elevation of craft traditions. These factors notwithstanding, what careful historical study has clearly shown is that there was nothing inevitable about the emergence of modern science and that among the contingent factors that made it possible, religious considerations were at the forefront. We can safely conclude that the common idea of a perennial and inevitable struggle between science and religion is patently false, and that perhaps even today, science tacitly relies upon unspoken religious presuppositions and trades on a legitimacy originally conferred upon it by theology.


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26 John Herschel, *Preliminary Discourse*, new edn. (London: Longman, Brown, Green & Longmans, 1851), pp. 5, 16.

27 George Fairholme, *A General View of the Geology of Scripture* (London: James Ridgway, 1833), p. 28.

28 Francis Bacon, *Novum Organum*, II.lii, Works, vol. 4, pp. 247f.


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