

**PETER HARRISON**

## **The Bible, Protestantism and the Rise of Natural Science: A Rejoinder**

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Let me begin by expressing my gratitude to Jitse van der Meer and Richard Oosterhoff for taking the time to write a considered critique of some of the ideas put forward in *The Bible, Protestantism and the Rise of Natural Science*. I am also grateful to the editor of *Science and Christian Belief* for affording me the opportunity to respond and to clarify some aspects of the argument of that book. First, I will provide my own summary of the book's thesis and offer some remarks about what a thesis on the origins of science should look like. This will be followed by a response to the major criticisms of van der Meer and Oosterhoff, which are levelled against that aspect of my thesis that deals with Protestant hermeneutics. I will then move on to an exploration of how well 'Protestantism' functions as an explanatory category and discuss whether it can work in the way I have suggested. Finally, I will address a few specific criticisms and offer some concluding remarks.

### **'Harrison's Hypothesis'**

On van der Meer and Oosterhoff's reading, my thesis is essentially that some unitary thing – 'Protestant hermeneutics' – was the necessary and sufficient cause of the emergence of modern science. At times, towards the end of the paper, my thesis appears in a slightly different formulation, namely that 'the Protestant reformation [was] responsible for the rise of modern science'. Either way, what I actually argue in the book is rather more nuanced than this. My own summary of the thesis reads:

The Bible – its contents, the controversies it generated, its varying fortunes as an authority, and most importantly the new way in which it was read by Protestants – played a central role in the emergence of natural science in the seventeenth century (pp. 4f.).<sup>1</sup>

Note first that I argue that the Bible 'played a central role' in the emergence of natural science, not that the Bible, or 'Protestant hermeneutics' or the Protestant reformation was the sole cause of the appearance of modern science. Moreover, of the various claims relating to the significance of the Bible in this respect (and each is significant), that which I identified as most important – 'the new way in which it was read by Protestants' – has three distinct elements, each of which is discussed in the book. One aspect of this 'new way of reading'

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<sup>1</sup> All page numbers in brackets are references to *The Bible, Protestantism and the Rise of Natural Science*, Cambridge: Cambridge University Press (1998).

is certainly what we might call 'Protestant hermeneutics', which is to say, a theory of how to interpret Scripture. But also included in this category, and fundamental to my argument, is the way in which particular passages of Scripture (such as the Genesis narratives of creation) were now read in a way that sanctioned and motivated scientific enquiry. The final chapter of the book is devoted solely to a discussion of this issue, and it is further developed in a number of articles and in my most recent book.<sup>2</sup> A third element of this 'new way of reading' concerns the fact that Protestants were enjoined to read Scripture for themselves and arrive at their own conclusions about its meaning without reference to received authorities. This last point is mostly independent of the issue of theories of interpretation, and points rather to the importance of new attitudes to authorities in the sphere of religion and, by implication, natural philosophy. Van der Meer and Oosterhoff say little or nothing about these second and third elements and focus almost solely on the first. In short, they tend to focus on one facet of my argument and place a burden upon it – that of bringing modern science into existence – beyond that which I expected it to bear.

Before turning to the specific role of Protestant hermeneutics, it is also worth considering further what a thesis such as mine might hope to establish. What does it mean to claim that factors relating to the Bible and its interpretation 'played a central role in the emergence of modern science'? My suggestion is not that somehow the Protestant Reformation is responsible for the host of contingent factors that were necessary conditions for the emergence of science. But I do think that Protestant reformation promoted values and attitudes towards the natural world that allowed these contingent factors to coalesce into something that begins to look like modern science. This is in keeping with my conviction that values and attitudes, in this case religious ones, provide a key to understanding the emergence of science in the West – and here I part company with those who argue for the priority of material factors. One way in which we can see the significance of this approach is to consider the fact that what we might crudely refer to as 'the preconditions for science' existed at various times in other cultures. The question then becomes: What is distinctive about this particular time and place where we witness the emergence of modern science as a permanent feature of Western society? I am not alone in suggesting that at this time in the West a unique set of values appears that underpins the scientific project and provides it with ongoing legitimacy.<sup>3</sup> Similar ideas have been expressed by Max Weber and Robert K. Merton, although admittedly their theses have been subjected to searching criticism. More recently, in *The Emergence of a Scientific Culture* (2006), Stephen Gaukroger has posed the same question and provided a response that also points to the

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2 Harrison, P. *The Fall of Man and the Foundations of Science*, Cambridge: Cambridge University Press (2007); 'Subduing the Earth: Genesis 1, Early Modern Science, and the Exploitation of Nature', *The Journal of Religion* (1999) 79, 86-109.

3 See Harrison, P. 'Was There a Scientific Revolution?', *European Review* (2007) 15, 445-457; 'Religion, the Royal Society, and the Rise of Science', *Theology and Science* (2008) 6, 255-271.

significance of religious factors in the emergence of modern science.<sup>4</sup> Readers who are interested in this approach to the question of how science takes hold in the West should read this remarkable book.

My thesis, then, is that the Protestant Reformation is responsible for the 'preconditions' of science in only a limited sense and that more important is the way in which it makes a vital contribution to the ideological foundations of an ongoing scientific project. Part of the contribution was negative – that of destroying an understanding of the theological significance of the natural world in which nature was passively read for its theological meanings. Features of the Protestant approach to interpretation are the relevant consideration here. This destruction of the emblematic world view of the Middle Ages makes space for an alternative way of understanding nature and its theological significance. Part of the contribution was positive. Here, a vital factor was the way in which biblical narratives in Genesis, now read solely for their historical or literal sense, promoted a new kind of engagement with nature – specifically, that of re-establishing a dominion over natural things that had been lost as a consequence of the Fall. At the same time we encounter a new conception of human vocation, developed by Luther and Calvin. On this new understanding, the human being is called to active labour in the world, as exemplified in Adam's original work in the Garden of Eden. Simplifying the matter somewhat, this entails a move from the contemplation of nature to an active engagement with it. The goal of this engagement with nature is to re-establish dominion over it and to restore it to its prelapsarian perfection. These factors invest emerging scientific practices with a religious legitimacy that will eventually see them occupy a central place in Western societies.

All that said, the specific argument which Van der Meer and Oosterhoff focus on – that which attributes to the Protestant reformers a specific role in the collapse of emblematic readings of nature – is important and if their criticisms turn out to be warranted it will certainly weaken my overall case.

### **The interpretation of Scripture**

Because I have discussed a number of these issues with the authors, I know that they have taken pains to represent my case accurately and fairly. Unfortunately their own rendition of this particular argument is unclear and at times misleading. Because the argument is reconstructed in their own words, exegesis is unhelpfully mixed with interpretation. Of particular concern is the fact that their restatement of my thesis contains a number of terms that are used by neither the historical actors, nor by me: 'nature symbolism', 'quadrigal literal sense', 'factual allegory', 'verbal allegory', 'logical causal mode of thought' and so on. These appear to be neologisms of the authors' own devising and they

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<sup>4</sup> Gaukroger, S. *The Emergence of a Scientific Culture: Science and the Shaping of Modernity, 1210-1685*, Oxford: Oxford University Press (2006), esp. ch.1.

mostly serve to confuse rather than clarify. As a general rule, I think it best to rely on terms that the historical actors used and provide explanations of these where necessary. At any rate, given the potential for misunderstanding, it might be best to restate this part of my argument.

The notion that God was the author of ‘two books’ – nature and Scripture – is at least as old as Augustine and was prevalent in the Middle Ages and the early modern period.<sup>5</sup> When we examine the way in which these metaphors have been used over time, it is clear that a significant change occurs in the sixteenth century. Before this, the ‘book of nature’ metaphor conveys the idea that God has invested the things of nature with a symbolic significance and that the contemplation of nature will reveal the theological meanings of the creatures. The Bible is important in this process because it provides the key to these theological meanings. Allegorical interpretation was understood to provide this link between Scripture and nature, on account of the fact that it invited the reader to move from the literal words of Scripture to contemplation of the objects of nature. On this view, the words of Scripture had literal meanings, but the objects of the world to which these words referred could have multiple meanings. Allegory, then, was not a way of reading multiple meanings into the Bible, but a sophisticated way of linking the meanings of the words of Scripture to the meanings of objects in the natural world.

All of this was to change in the sixteenth and seventeenth centuries when the ‘book of nature’ metaphor is radically reconfigured. Now the book of nature no longer yields theological meanings. Instead, the theological/symbolic order that it once possessed is replaced by a mathematical or taxonomic order. It is still God’s book, but now in a rather more restricted sense: we can *infer* God’s wisdom and power from the mathematical order of nature or from the wonderful contrivances (or designs) of creatures. This is rather different from *reading* the theological meanings that God has implanted in the creatures. To some extent, this development is constitutive of a move in the direction of a scientific conception of nature and it is perhaps no surprise that it is key figures in the new sciences who use the book of nature metaphor in this new way. My claim is that a significant factor in this development was the fact that the Protestant reformers were sharply critical of allegorical interpretation, understood in the sense outlined above, and that their criticisms of allegory (and of symbolic representation more generally) had major implications for the way in which nature was interpreted. There is more to it than this. But this outline should suffice for the present.

The way in which van der Meer and Oosterhoff render my argument is a little different from this and is complicated by the introduction of their own categories. One example is ‘nature symbolism’: ‘To explain Harrison’s argument we offer a brief description of *nature symbolism*.’ (my emphasis) To reiterate, I

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5 On ‘the book of nature’, see van Berkel, K. and Vanderjagt, A., (eds.) *The Book of Nature in Early Modern and Modern History*, Leuven: Peeters (2006).

do not use the term 'nature symbolism' anywhere in the book and its introduction into the argument serves to obfuscate rather than elucidate. Thus, 'nature symbolism' is said to entail the view that 'a word in Scripture had at least two meanings – a literal meaning as well as an allegorical or spiritual'. Subsequently, I am credited with the view that nature symbolism entails 'giving multiple meanings to the word and rendering its meaning indeterminate'. This is simply wrong, for in keeping with the medieval sources my consistent claim is that *allegory* – the term used by the historical actors – allows *things* to be bearers of multiple meanings, but not *words*. The authors even quote me to this effect in the next paragraph, but do not seem to notice that this directly contradicts their own account. The confusion continues with the claim that 'The four senses [literal, tropological, anagogical, allegorical] apply to both Scripture and nature'. They do not. Only the allegorical relates to nature. Grasping this is vital for an understanding of my argument, which is that the denial of allegory will have implications for how we understand nature.

This misreading of the argument has further implications for the next section of the paper, where van der Meer and Oosterhoff move on to a discussion of the late medieval transformation of the literal sense. This is perhaps the strongest element of their critique and I must concede at this point that medieval precedents for collapsing the spiritual senses of Scripture into the literal sense ought to have received much more attention than I gave them. Nicholas of Lyra, in particular, warrants more than a passing note (p. 123, n. 3). That said, the book does include some discussion of precedents for the Protestant positions on biblical interpretation (pp. 109ff.) and I shall say more below about the extent to which the ideas of the Protestant reformers had their roots in medieval Catholicism. However, part of the point that van der Meer and Oosterhoff wish to make here is that Lyra's identification of Solomon with Christ is the kind of thing that we find in the Protestant reformers and that, accordingly, they retained an element of allegorical interpretation. The difficulty with this claim is that the identification of Solomon with Christ is an example not of allegory, but of *typology*, which provided a way of linking characters in the Old Testament to those in the New (Solomon with Christ, for example). Typology (which refers to persons or events) is not to be confused with allegory (which refers to objects). As I took pains to point out in the book (pp. 129-131), typological reading of Scripture remains vital to Protestant exegesis, but its use is entirely consistent with the rejection of allegory. It follows that the 'literal sense' as understood in this era includes much that we might regard as non-literal, but this does not count against my argument which concerns the rejection of allegory (pp. 128-129). All of this, along with a discussion of the significance of Nicholas of Lyra, was subsequently set out in an article that appeared in this journal in 2006.<sup>6</sup>

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6 Harrison, P. 'The Bible and the Emergence of Modern Science', *Science and Christian Belief* (2006) 18, 115-132.

## Correlating science with Protestantism?

One weakness of my thesis, as originally set out, was that it relied on categories that were too general and too brittle. In certain respects the category 'Protestantism' is not really precise enough and the concept of a 'Protestant hermeneutics' fails to do justice to the diversity of hermeneutical positions and actual exegetical practices within the various Protestant confessions. (While I am in a confessional mode, let me add that the book often referred to 'science' when it might have been better to observe the distinction between natural history, natural philosophy, the mathematical sciences and so on, and to have specified how my thesis related to these different aspects of what we now call 'science'.) Related to the problematic identity of 'Protestantism' is the fact that certain tendencies and trends that I identified as characteristically Protestant were already present in the diverse culture of late medieval Catholicism and Renaissance humanism. (Van der Meer and Oosterhoff have pointed this out with respect to aspects of the Reformers' approach to the interpretation of Scripture.) But all that follows from this is that the Protestant Reformation had its roots in the reforming tendencies of late medieval Catholicism. It could hardly have been otherwise. What is significant about the Protestant Reformation is that it provided institutional contexts in which a number of these elements could be drawn together. Indeed, to some extent that is what the Protestant Reformation was: the coalescing of a number of these incipient reforming tendencies.

The Reformation thus made possible, in a quite unprecedented way, the appearance of sets of practices that reinforced negative attitudes towards symbolic representation and hence, indirectly, encouraged new attitudes to nature (pp. 115-120). These include Protestant iconoclasm, the condemnation of idolatry, a restriction of the number of sacraments and the shift of focus in worship from the celebration of the Mass to the preaching of the word. These latter factors are important because they provided means of widely disseminating a new set of attitudes towards symbols. In other words, there were concrete ways in which Protestant ideas were embodied in practices that could act as vectors for new attitudes to nature. Added to this is the distinctive emphasis on the importance of the earthly vocation that we encounter in both Luther and Calvin. Medieval allegory was closely tied to a conception of the philosophical life as one of contemplation as opposed to action. The early modern emphasis on the priority of the active life, and the emergence of new conceptions of what it was to be a philosopher (in particular a natural philosopher), would necessitate a renegotiation of the connections between biblical exegesis and natural philosophy.<sup>7</sup>

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7 See Harrison, P. 'Reinterpreting Nature in Early Modern Europe: Natural Philosophy, Biblical Exegesis, and the Contemplative Life', in Killeen, K. and Forshaw, P. (eds.) *The Word and The World: Biblical Exegesis and the Emergence of Modern Science*, London: PalgraveMacmillan (2007), pp. 25-44; 'The Natural Philosopher and the Virtues', in Condren, C., Hunter, I. and Gaukroger, S. (eds.) *The Philosopher in Early Modern Europe: The Nature of a Contested Identity*, Cambridge: Cambridge University Press (2006), pp. 202-228.

Another aspect relating to the identity of Protestantism concerns the power that religious institutions exerted over the practice of science. In their section on 'Ecclesiastical suppression and the rise of science', our authors write: 'The notion that the development of science was suppressed in Roman as opposed to Protestant territory has also been used to suggest that the Protestant Reformation was responsible for the rise of modern science.' Some may have argued this, but I am not among them. What I have suggested, and this is virtually a truism, is that where ecclesiastical authorities sought to have direct involvement in matters of natural philosophy and had the power to do so, there were inevitable consequences for the way in which the natural sciences developed in the relevant territories. Generally speaking, the Catholic Church was better at this than anyone else. The activities of the Holy Office are a case in point, although it is true that the various prohibitions issued by the Inquisition were better implemented in some places than in others.

Jesuit science is mentioned in this context as an apparent counter-instance to my thesis, but in fact the activities of the Society of Jesus provide a good example of the way in which centralised authority exerted its influence in Catholic educational contexts throughout Europe. It is now fashionable to praise Jesuit science, and this trend represents an important corrective to long-standing prejudices against Jesuit contributions. That said, virtually all scholars of Jesuit science acknowledge the powerful impact of insitutional constraints on the activities of members of the Society. As agents of the Catholic Reformation, Jesuits were enjoined to defend Aristotle in philosophy and Thomas in theology. Loyalty to Aristotle is not generally regarded as the hallmark of forward thinking for seventeenth-century natural philosophers. The condemnation of heliocentrism in 1616 can hardly have made life easy for Jesuit astronomers, and the 1651 proscription of another thirty propositions in natural theology would not have helped either. Much recent work on Jesuit science amounts to the claim that the contributions of the Jesuits were rather good, *considering the restrictions they worked under*. Mordechai Feingold, who has recently edited two excellent collections on the subject, thus observes that 'the constraints imposed on Jesuit writers from above affected, often profoundly, their teachings and publications'.<sup>8</sup> Obviously it does not follow from this that 'the Protestant Reformation was responsible for the rise of modern science'. What does follow is that confessional divides had an impact on the development and dissemination of science.

## Conclusion

Before offering some concluding remarks, here are very brief responses to three further criticisms. First, on 'fifteenth-century globalisation and its conse-

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8 Feingold, M. 'The Grounds for Conflict: Griebberger, Grassi, Galileo and Posterity', in Feingold, M. (ed.) *The New Science and Jesuit Science: Seventeenth Century Perspectives*, Dordrecht: Kluwer (2002), pp. 121-158 (p. 123).

quences', although I hesitate to use the term 'globalisation' in this context, there is no doubt that the voyages of discovery placed great strain on the more traditional symbolic networks and hence played an important role in the process that saw the collapse of the emblematic world-view. A complete section of the third chapter of the book is devoted to precisely this theme (pp. 82-91). Secondly, did biblical literalism sometimes impede the development of natural philosophy? Of course it did. But the issue is whether, as an indirect consequence of developments in the sphere of biblical hermeneutics (and specifically the gradual abandonment of the medieval *quadriga*), there were developments in natural philosophy that promoted what we would call modern science. Thirdly, yes, there were survivals of the allegorical world-view beyond the end of the sixteenth century (Jonathan Edwards is an intriguing example). But the question is whether these examples are in any way representative. Specific counter-instances do not, of themselves, falsify a clear general trend.

To conclude, few writers, I imagine, look back on works written over ten years in the past without a recognition of at least some of their deficiencies. Van der Meer and Oosterhoff have quite rightly drawn our attention to continuities between some medieval exegetical practices and those of the Protestant reformers that were neglected in the original articulation of my thesis. It follows that the idea of a discrete 'Protestant hermeneutics' needs to be treated with some care. There are other failings that I could mention. However, I do not believe that these difficulties seriously challenge the more general thesis, and a number of their objections have already been addressed in articles that have appeared since the publication of the book. More importantly, perhaps, the ideas first articulated over ten years ago have been developed further in a number of these articles (some of which have been referred to in my notes). There is also a recent book which, as already mentioned, looks more closely at the way in which particular passages of Scripture, read in their literal sense, motivated scientific enquiry and offered a necessary religious legitimation for new scientific practices. These ongoing refinements, not mentioned in the article, further strengthen the case first made in *The Bible, Protestantism and the Rise of Natural Science*.

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