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Newtonian Science, Miracles, and the Laws of Nature

Peter Harrison

Introduction

“Newton,” writes Richard Westfall, “both believed in and did not believe in miracles.” It can only be concluded, Westfall continues, that the great scientist, unwilling to relinquish his belief in a providential and interposing Deity, “abandoned himself to ambiguities and inconsistencies, which gave the appearance of divine participation in nature, but not the substance.”¹ Newton’s apparent ambivalence towards miracles highlights what to many commentators is one of the most curious features of seventeenth-century natural philosophy. Leading scientists of this era, almost without exception, had a dual commitment on the one hand to a science premised upon a mechanical universe governed by immutable laws of nature and on the other to a omnipotent God who intervened in the natural order from time to time, breaching these “laws” of nature.² This puzzle is heightened by the fact that (in England at least) those figures who were at the forefront of an advancing mechanical science were also the most staunch defenders of miracles.³ The Christian virtuosi of the Royal Society—Robert Boyle, Thomas Sprat, and John Wilkins, to take the most prominent examples—insisted not only that miracles could take place but that they played a vital role in establishing the truth of Christian religion.⁴

¹ Richard Westfall, *Science and Religion in Seventeenth Century England* (New Haven, 1970), 204.

² See, e.g., *ibid.*, 5, 89; James Force, “The Breakdown of the the Newtonian Synthesis of Science and Religion,” in Force and Richard Popkin (eds.), *Essays on the Context, Nature, and Influence of Isaac Newton’s Theology* (Dordrecht, 1990).

³ R. M. Burns, *The Great Debate on Miracles from Joseph Glanvill to David Hume* (London, 1981), 12.

⁴ Boyle, *The Christian Virtuoso in The Works*, ed. Thomas Birch (6 vols.; Hildesheim, 1966), V, 531; Thomas Sprat, *The History of the Royal Society* (London, 1667), 352; John Wilkins, *Of the Principles and Duties of Natural Religion* (London, 1675), 402.

It is now often assumed that such devout seventeenth-century scientists led strange dichotomous mental lives or, more charitably, that their felicitous reconciliation of scientific and religious pursuits was built upon a set of assumptions which only later, in light of arguments proposed by Hume and his successors, proved to be mutually conflicting. In this paper I hope to shed light upon one aspect of this puzzle by showing that Newton, along with his most prominent disciples, William Whiston and Samuel Clarke, came to understand miracles in a way quite different from their seventeenth-century predecessors, and that in developing this new conception of the miraculous they managed to avoid those conceptual confusions which are thought to afflict the cognitive worlds of their earlier contemporaries. The central feature of the Newtonians' position on this question concerns the definition of "miracle." As we shall see, the Newtonians rejected that standard definition of miracle, according to which a miracle must involve a violation of laws of nature. Their alternative conception, significantly, could still serve the interests of Christian apologetics but without undermining the foundation upon which the scientific enterprise was constructed and without committing its adherents to the ambiguities and inconsistencies of which they are so often accused.

Defining "Miracle"

Modern discussions of miracles generally begin by defining a "miracle" as "a violation of the laws of nature." To this basic definition may be added the condition that the breach of the laws of nature occur as a result of the activity of God or some other supernatural agent; occasionally it is specified as a further requirement that the breach occur in order to confirm some religious doctrine or to establish the authority of some person.⁵ It has frequently been pointed out that, given such a definition, the very concept of "miracle" suffers from an inherent logical instability. Miracles, it seems, are parasitic upon the idea that there are laws of nature: without laws of nature, there can be no miracles; however, if there are miracles, this tends to destroy the very concept of a law of nature.⁶ For present purposes, the more interesting question to arise from this definition has to do with the conception of miracle which existed before the advent of modern science with its clearly formulated laws of nature. Miracles, in other words, have always had some apologetic function in Christian theology, a function which they exercised

⁵ The classic statement of this definition appears in David Hume's "Of Miracles," *An Enquiry concerning Human Understanding*, ed. L. A. Selby Bigge (Oxford, 1975³), XI.90 (114f.) For a more recent discussion of this definition see Richard Swinburne, *The Concept of Miracle* (London, 1970), ch. 3.

⁶ See, e.g., Antony Flew, *God and Philosophy* (London, 1966), 148f. For a response to objections of this kind, see *Miracles*, ed. R. Swinburne (London, 1989), 9f, and Paul Dietl, "On Miracles," in *Contemporary Philosophy of Religion*, ed. Steven Cahn and David Schatz (Oxford, 1982), 146-53.

quite satisfactorily without recourse to a science committed to explanation in terms of laws of nature. Augustine, and after him Aquinas, helped shape a premodern conception of miracles, a conception which did not and indeed could not involve reference to laws of nature but which came to be directly relevant to the Newtonian redefinition of “miracle.”

Augustine was actually the first to attempt a formal definition of “miracle.”⁷ A miracle, he wrote in a letter to his Manichaean friend Honoratus, is “anything which appears arduous or unusual, beyond the expectation or ability of the one who marvels at it.”⁸ Such marvellous events, he was to say elsewhere, are not “contrary to nature” but rather “contrary to *our knowledge of nature*.”⁹ Ignorance of the causes of an event, however, was a necessary but insufficient mark of the miraculous. For Augustine all the phenomena of nature—“the changes of day and night, the very constant order of heavenly bodies, the fourfold change of the seasons”—were in a sense miraculous. But they were not regarded as such because they are part of our constant experience.¹⁰ In Augustine’s rather subjective view of miracles, then, a miracle had to have an unknown cause and it had to be unusual. Yet there was no intrinsic difference between the miraculous and the mundane—miracles were distinguished only by their effect on observers.

Aquinas was concerned to arrive at a more precise definition, one which located the essence of miracle in the event and not in the observer. He did this by yoking the religious sense of miracle to the Aristotelian doctrine of the intrinsic “qualities” or “powers” of substances. While agreeing with Augustine that a miracle is not contrary to nature, Aquinas argued that a miracle was nonetheless “apart from the order implanted in things.”¹¹ It follows that miracles invoke wonder (Augustine’s definition) because their cause defies explanation in terms of the natural properties of the objects involved: an event is a miracle if “we observe the effect but do not know its cause.”¹² Aquinas further clarified his position by specifying three classes of event which seem to fit this description and yet are not genuine miracles. First are events the causes of which are known to some but not others. An eclipse of the sun, for example, is not miraculous because although most men are ignorant of its cause, the astronomer is not. A miracle can only be something that has “a completely hidden cause in an unqualified way ... not simply in

⁷ For a brief history of conceptions of the miraculous see John A. Hardon, “The Concept of Miracle from St. Augustine to Modern Apologetics,” *Theological Studies*, 15 (1954), 229-57. Specifically on Augustine, see R. M. Grant, *Miracle and Natural Law in Graeco-Roman and Early Christian Thought* (Amsterdam, 1952), 215-20.

⁸ *De utilitate credendi*, 16.34, in *The Fathers of the Church*, IV (New York, 1947), 437.

⁹ Augustine, *De civitate dei*, XXI.8; *Contra Faustum*, XXVI.3 (my emphasis).

¹⁰ *De civitate dei*, XVI.34; cf. Cicero, *De divinatione*, ii, 49.

¹¹ Aquinas, *Summa contra gentiles*, tr. Vernon Bourke (New York, 1955-57), III, 100.1.

¹² *Ibid.*, III, 101.1.

relation to one person or another: it must have a cause hidden from every man."¹³ A second class of non-miraculous event which seems to fit the description concerns the operation of occult qualities. Aquinas gave two stock examples here—the magnet which attracts iron and the small fish (the *Echeneis*) which was thought to be able to impede the passage of large ships. Although the causes of these observed phenomena are unknown, Aquinas states that the effect of such objects are “limited to some definite effect.”¹⁴ In other words the effects are repeatable and to some extent predictable. Therefore, while the cause is hidden, or occult, the effect is not miraculous. Finally, certain remarkable events have causes unknown to us because they are performed by superior beings—angels or demons. These are not true miracles because it is within the created power of these free agents to perform these acts. Just as it is within the power of a human agent to throw a stone up into the air, causing it to act “unnaturally,” so invisible agents can bring about unusual effects even though they do not act above their created natures. Of these events Aquinas says:

now since the entire power of created nature is unknown to us, when anything occurs outside the usual run of things through some power unknown to us, we assume that it is miraculous [*est miraculum quod nos*]. So when the demons do something by their own natural power, we say that this is a miracle not in the strict sense, but *relatively to us*.¹⁵

Aquinas thus provides a clear account of what a genuine miracle is but at the same time concedes that an observer, relying on unaided reason, may not be able to distinguish the genuine from the “relative” miracle. In other words Aquinas’s definition enables us to specify the formal conditions for a true miracle even though in practice we might not be in a position to know whether any given event meets those conditions: it is always possible that an unusual event has causes which are natural (i.e., not beyond the created powers of things) and yet unknown.

With the onset of the scientific revolution, the standard Thomist account of miracles became inadequate for two reasons. First, the Aristotelian doctrine that individual substances had inherent powers was abandoned. In the new philosophy, natural objects were stripped of those natural qualities which had hitherto provided the basis of causal explanations of their activities. Scientific accounts of events were no longer couched in terms of the formal and material causes or the created powers of the objects involved. Now explanations relied upon externally-acting efficient causes. The regular

¹³ *Ibid.*

¹⁴ *Ibid.*, III.102.3.

¹⁵ *Summa theologiae* (London, 1964-76), 1a.110, 4. (XV, 17) (my emphasis). Cf. *Summa contra gentiles*, III, 102.

operations of these secondary causes were described in laws of nature. In the new mechanical world order miracles came to be understood as violations or suspensions of these laws. Robert Boyle, for example, wrote that while God established laws of nature, “yet he has not bound up his own hands by them, but can invigorate, suspend, overrule, and reverse any of them as he thinks fit.”¹⁶ John Wilkins, one of the founders of the Royal Society, agreed that a miracle was a “violation” or “disordering” of “the universal Laws of Nature.”¹⁷ Thomas Sprat, first historian of the Royal Society, spoke similarly of God’s prerogative to “change the wonted Laws of the *Creation*.”¹⁸ This understanding of miracle enjoyed wide acceptance in both scientific and theological circles.¹⁹ From this modern conception it followed that, barring God’s intervention or “interposition,” everything which took place in the world could be accounted for in terms of regular secondary causes. Thus, while God was the ultimate cause of all things, he was the immediate cause only of the miraculous. All his other works were brought about through the operation of secondary causes.²⁰

It was not only the scientific revolution which highlighted the inadequacy of the Thomist account of miracles. Changes in the very conception of “religion” meant that now miracles were to play a vital role in the confirmation of those doctrines presumed to constitute the essence of Christianity. The two centuries following the Protestant Reformation witnessed a remarkable shift in emphasis from faith to knowledge. Increasingly Christianity was thought to be about assenting to certain revealed propositions which together constituted “saving knowledge.” Miracles, along with fulfilled prophecies, came to be the most important criterion by which the authenticity of putative revelations could be assessed. It is for this reason that apologetic arguments based on miracles became prominent during the early modern period.²¹ Again, Robert Boyle is typical. The evidence of miracles, he argued, “is little less than absolutely necessary to evince ... that the

¹⁶ Boyle Manuscripts, Royal Society, London, VII, fols. 113-14, cited by Burns, *The Great Debate*, 54. Cf. Boyle, *A Disquisition about the Final Causes of Natural Things* (London, 1688), 96.

¹⁷ Wilkins, *Principles and Duties of Natural Religion*, 402.

¹⁸ Sprat, *History of the Royal Society*, 357.

¹⁹ For theological uses of this definition see, e.g., Robert Jenkin, *The Reasonableness and Certainty of the Christian Religion* (London, 1698), 34; Thomas Browne, *Miracles Work’s Above and Contrary to Nature* (London, 1683); Edward Stillingfleet, *Origines Sacrae* (Cambridge, 1702⁷), 170.

²⁰ Boyle, *A Free Inquiry into the Vulgarly received Notion of Nature*, *Works*, V, 252f.; *The Christian Virtuoso*, *Works*, V, 532.

²¹ Admittedly, miracles and prophecy had in the past been exploited as arguments in favor of the Christian revelation. See Aquinas, *Summa theologica*, 1a2ae.111, 4. However, in no previous period of history had they achieved the prominence which they were to enjoy in the late seventeenth and early eighteenth centuries. See Burns, *The Great Debate*, 12. The use of miracles as evidences, moreover, is typically Protestant. Catholic discussions of miracles are as much about criteria for canonization.

Christian [religion] does really proceed from God.”²² But if miracles were to perform this apologetic function, there had to be clear criteria which distinguished them from the merely remarkable—from Aquinas’s “relative miracles”—as well as from the spurious miracles of Catholics and enthusiasts.²³ On the understanding that miracles were violations of the laws of nature, it followed that those most familiar with these laws would be best placed to judge whether any given event warranted the label “miracle.” Aquinas, while subscribing to a different conception of scientific explanation, had already argued for the special expertise of the scientist in the discernment of true miracles.

This view was to be vigorously restated in seventeenth-century England by the virtuosi of the Royal Society. Robert Boyle was thus to argue that the practitioner of the new philosophy “will examine with more strictness and skill, than ordinary men are able, miracles, prophecies, or other proofs, said to be supernatural, that are alleged to evince a real religion” and so discern “the certain and genuine characters of truth.”²⁴ Sprat endorsed Boyle’s view, arguing for the unique competence of the experimental philosopher:

He cannot suddenly conclude all extraordinary events to be the immediat Finger of *God*, because he familiarly beholds the inward working of things, and thence perceives that many effects, which use to affright the *Ignorant*, are brought forth by the common *Instruments of Nature*.²⁵

So it was that the leading advocates of the mechanical philosophy in England specified clear formal conditions for the occurrence of miracles and, equally importantly, made the unprecedented claim that they could ascertain when these conditions had been satisfied. Both religious and scientific thinkers in mid-seventeenth-century England seemed to be adequately served by this conception of miracle, remaining blissfully unaware of what to later commentators was a glaring inconsistency in their approach. Boyle and those of his fellow scientists who vociferously advocated the apologetic use of miracles saw only the positive features of their approach—that once the

²² Boyle, *The Christian Virtuoso, Works*, V, 531. Cf. Sprat, *History of the Royal Society*, 352; John Wilkins, *Principles and Duties of Natural Religion*, 402.

²³ This remained a problem for moderate proponents of the argument from miracles. Stillingfleet, for example, while favouring the argument from miracles, despaired that “there be no certain κριτήρια or notes of difference, whereby to know Divine Miracles from Delusions ...” (*Origines Sacrae*, 225).

²⁴ Boyle, *The Christian Virtuoso, Works*, V, 538, 531.

²⁵ Sprat, *History of the Royal Society*, 358f. Cf. Anon, *A Short Discourse concerning Miracles* (London, 1702), 26f; Robert Filmer, *An Advertisement to the Jurymen of England touching Witches* (London, 1688), 8; John Gaule, *Select Cases of Conscience touching Witches* (London, 1646), 98; Francis Bacon, *The Advancement of Learning and New Atlantis*, ed. Arthur Johnston, (Oxford, 1974), 222.

immutable laws of nature had been uncovered there would be no doubt what sorts of events would be miraculous. Their blindness to the apparent logical instability of the concept is what has led contemporary commentators to speak of the “absolute contradiction” in their thought.²⁶ The Newtonians who followed them, particularly Richard Bentley, Whiston, Clarke, and even Newton himself, were far more aware of the difficulties in reconciling a mechanistic world with an interposing God. Yet they too were to find a place in their scientific world for miracles.

The Newtonian Conception of “Miracle”

In the inaugural series of Boyle Lectures held in the years 1691-92 Richard Bentley had proposed a new argument for the existence of a providential God. Here he announced that “all the powers of mechanism are dependent on the Deity,” for “gravity, the great basis of all mechanism, is not itself mechanical, but the immediate *fiat* and finger of God, and the execution of divine law.”²⁷ William Whiston took up Bentley’s cue and argued similarly that gravity depended upon “the constant and efficacious, and, if you will, the supernatural and miraculous Influence of Almighty God.”²⁸ Samuel Clarke likewise insisted that “all those things which we commonly say are the Effects of the *Natural Powers of Matter*, and *Laws of Motion*; of *Gravitation*, *Attraction*, or the like; are indeed ... the Effects of *God’s* acting upon Matter continually and every moment.”²⁹ Even Newton was reported as having observed “that a continual miracle is needed to prevent the Sun and the fixed stars from rushing together through gravity.”³⁰ For the Newtonians, then, it followed that a conception of miracle which relied upon God’s interposition or the operation of his immediate power was unavailable, for the mundane operation of gravity fell under that description. If the operation of gravity was, as Whiston indicated, a supernatural and miraculous occurrence in terms of the prevailing definition, then a new understanding of miracle was required, for without such a definition, gravitation, and the whole mechanical system it supported, would be deemed miraculous. To Samuel Clarke, that redoubtable apologist for Newtonian

²⁶ Westfall, *Science and Religion*, 89.

²⁷ Richard Bentley, Boyle Lectures, Sermon IV, in *The Works of Richard Bentley*, D.D., ed. Alexander Dyce (London, 1838⁶), III, 74, 75. Cf. Sermon VI, *Works*, III, 163f. God’s active presence was required in the mutual attraction of bodies in order to shield Newton from the charge of reviving either occult qualities (of which Leibniz accused him) or atheistic Epicureanism. See Newton’s correspondence with Bentley, in *Works of Richard Bentley*, III, 211f.; cf. *The Leibniz-Clarke Correspondence*, ed. H. G. Alexander, (Manchester, 1976), 92.

²⁸ William Whiston, *A New Theory of the Earth* (London, 1696), 218.

²⁹ Samuel Clarke, *The Evidences of Natural and Revealed Religion*, in *The Works of Samuel Clarke*, D.D. (2 vols.; London, 1738), II, 697, cf. 601.

³⁰ Memoranda by David Gregory (1694), *The Correspondence of Isaac Newton*, ed. H. W. Turnbull et al. (7 vols.; Cambridge, 1959-77), III, 336.

science, fell the task of redefining “miracle” in such a way as to exclude such mundane operations of God’s immediate power as gravity, and yet to maintain some continuity with the traditional sense of miracle and its apologetic role.

To retain the historical sense of “miracle,” Clarke revived the Augustinian notion that the key feature of a miracle is its unusualness. This understanding of miracles was developed in both the Boyle Lectures of 1704-5 and in the celebrated correspondence with Leibniz. In the former he argues that

absolutely speaking, in *This strict and Philosophical Sense*; either nothing is miraculous, namely, if we have respect to the Power of God; or, if we regard our own Power and Understanding, then almost *every thing*, as well what we call natural, as what we call supernatural, *is in this Sense* really miraculous; and ’tis only *usualness* or *Unusualness* that makes the distinction.

There is, Clarke asserts, “no such thing, as what Men commonly call the *course of Nature*, or the *Power of Nature*....” He concludes: “’Tis not therefore a right Distinction; to define a *Miracle* to be That which is against the *Course of Nature*.”³¹

It is worth mentioning at this stage that in addition to this “philosophical” definition, Clarke also offered a “theological definition” in which he appears to return to the traditional conception of the interposition of God.³² Commentators have usually taken this to mean that in the final analysis, Clarke takes a traditional view of miracles. What seems more likely is that Clarke holds that the same event may admit both philosophical and theological explanations—the former dealing with causes, the latter with purposes. How these two definitions of miracle might consistently be held is an issue to which we shall return. For the moment let us note that in the protracted controversy with Leibniz, in which a significant proportion of the discussion was given over to the notion of miracle, Clarke’s whole case is based upon the philosophical understanding of miracle. “Natural” and “supernatural,” he again insists, are “distinctions merely in our conceptions of things.”³³ A miracle, he later points out, “does not consist in any difficulty in the nature of the thing to be done, but merely in the unusualness of God’s doing it.”³⁴

³¹ Clarke, *Evidences of Natural and Revealed Religion, Works*, II, 697f. Cf. *Leibniz-Clarke Correspondence*, 114; and Sermon CLVIII, “Of the Duty of Prayer,” *Works*, II, 281.

³² “[T]he true Definition of a Miracle, in the Theological Sense of the Word, is this; that it is work effected in a manner Unusual, or different from the common and regular Method of Providence, by the interposition either of God himself, or of some Intelligent Agent superiour to Man, for the Proof or Evidence of some particular Doctrine, or in attestation to the Authority of some particular person” (*Evidences of Natural and Revealed Religion, Works*, II, 701).

³³ *Leibniz-Clarke Correspondence*, 24, 29, 35, 42.

³⁴ *Ibid.*, 114.

Leibniz was to respond that Clarke's definition of miracle differed from the "received notion" and would prove unacceptable to both divines and philosophers. If miraculous events were distinguished from the mundane merely by the subjective criteria proposed by Clarke, then, concluded Leibniz, "there will be no internal real difference, between a miracle and what is natural, and at the bottom, every thing will be either equally natural, or equally miraculous."³⁵ As it turned out, this implication had already been anticipated by Clarke, Whiston, and Newton as well.

Whiston agreed with Clarke that what constitutes a miracle is a function of our knowledge of causes, and the same event may thus be both miraculous and natural depending upon the state of knowledge of the observer. "Almighty God," he says, "has so constituted the World that no Body can tell wherein it differs from one, where all were solely brought to pass by a miraculous Power."³⁶ This also seems to have been the view of Newton. In a short unpublished note Newton wrote,

[M]iracles are so called not because they are the works of God but because they happen seldom and for that reason create wonder. If they should happen constantly according to certain laws impressed upon the nature of things, they would be no longer wonders of miracles but would be considered in philosophy as part of the phenomena of nature notwithstanding that the cause of their causes might be unknown to us.³⁷

Armed with this conception of miracles, the Newtonians and a number of their fellow travellers went on to show that many miracles, in particular those recorded in the Old Testament, were merely "relative." In one way or another the marvellous events set down by Moses in the Pentateuch could be demonstrated to fall within the mechanistic order of nature. Thomas Burnet, for example, set out a naturalistic account of the Old Testament Deluge in *Telluris Theoria Sacra* (1681).³⁸ In this work he set out a "first Rule con-

³⁵ *Ibid.*, 91.

³⁶ Whiston, *New Theory*, 219.

³⁷ Cited in Westfall, *Science and Religion*, 203f. Similar conceptions of miracle were espoused by Nehemiah Grew and John Locke. Grew thought that "Nature it self is a Standing Miracle, the Operations whereof, we should as much wonder at, as any Miracle, if we did not see them every day." *Cosmologia Sacra: or, a Discourse of the Universe as it is the Creature and Kingdom of God* (London, 1701), 195, 316. In his *Discourse of Miracles* (1706), Locke described miracles as events which were "above the comprehension of the spectator, and in his opinion contrary to the established course of nature" and which are, "taken by him to be divine" (*Works* [London, 1801¹⁰], IX, 256, my emphasis). For contemporary discussion of these definitions see William Fleetwood, *An Essay upon Miracles. In Two Discourses* (London, 1701), 2, 139; Anon., *A Short Discourse*, 3f. and passim; Samuel Chandler, *A Vindication of the Christian Religion* (London, 1725), 7-10.

³⁸ English tr., *The Theory of the Earth ... the First Two Books* (London, 1691²); cf. *Correspondence of Isaac Newton*, II, 319-34.

cerning miracles”—“That we must not flie to miracles, where Man and nature are sufficient.”³⁹ The Mosaic account, he insisted, “bears in it the evident marks of an accommodation to the vulgar notions concerning the form of the World.” Stripped of these marks of accommodation, the Genesis account of the world’s origins meshed quite neatly with his own scientific account of the Creation. William Whiston adopted the same principle in his *New Theory of the Earth* (1696). Numerous events recorded in sacred history, while presumed to result from miraculous interventions, were not in fact against the ordinary course of nature:

For those Events or Actions are in Holy Scripture attributed immediately to the Power of Providence of God, which yet were to all outward appearance according to the constant course of things, and would, abstracted from such Affirmation of the Holy Books, have been esteem’d no more miraculous than the other common Effects of Nature, or usual Accidents of Humane Affairs.⁴⁰

This, Whiston, later observes, is “the Secret of Divine Providence in the Government of the World, whereby the Rewards and Punishments of God’s mercy and Justice are distributed to his Rational Creatures without any disturbance of the settled Course of Nature, or a miraculous interposition on every occasion.”⁴¹ Whiston restated his view in *Astronomical Principles of Religion, Natural and Reveal’d* (1717), where he again asks whether “extraordinary and miraculous Cases” might not take place “without the direct Alteration of those fixed and Constant Laws of Nature.” Here he provides further examples of apparent miracles which admit of naturalistic explanations.⁴²

The *Cosmologia Sacra* (1701) of Nehemiah Grew (the stated purpose of which was, ironically, to refute the hermeneutical principles of Spinoza) proposed similar explanations of Old Testament miracles. The plagues of Egypt, to use but one of Grew’s examples, were all brought about by “sundry Natural Causes.” Moses’ turning of the river to blood was effected when the unfortunate aquatic inhabitants of the Nile simultaneously contracted a rather unpleasant gastric complaint: “all the Fish, small and great, with the *Hippopotamus*, *Crocodile*, and other Amphibious Creatures were seiz’d with a Dysenterick Murrain.”⁴³ It was the combined effluvia of this indisposed menagerie which changed the waters of the great river to blood.

³⁹ Thomas Burnet, *The Theory of the Earth ... the Last Two Books* (London, 1691), III, ch. viii.

⁴⁰ Whiston, *New Theory*, 218f.

⁴¹ *Ibid.*, 359. Cf. John Donne, *Essayes in Divinity* (Oxford, 1952), 81-84.

⁴² Whiston, *Astronomical Principles of Religion, Natural and Reveal’d* (London, 1717), 127f.

⁴³ Grew, *Cosmologia Sacra*, 196f.

Not surprisingly, critics of such accounts complained that the introduction of mechanical philosophy into hermeneutics not only did violence to the literal sense of Scripture, but did away with the traditional meanings of “ordinary” and “extraordinary providence,” and “miracle.”⁴⁴ This in turn threatened the whole apologetic enterprise which looked to miracles to validate the claims of the Christian revelation. If miracles were not different in a philosophical sense, from mundane events, and if the labels “natural” and “supernatural” amounted to the same thing, as Clarke adamantly insisted, then “miraculous” events could not be enlisted as support for the Christian revelation.⁴⁵

Miracles as Evidence

The standard use of miracles in the seventeenth-century apologetics was not quite as straightforward as critics have sometimes assumed.⁴⁶ Miracles were most usually used as proofs in conjunction with a number of other arguments. The basic tenets of natural religion—the existence of God, the immortality of the soul and so on—could be established by rational arguments (sometimes referred to as “internal evidences”). However, doctrines specific to Christianity, such as Incarnation and Trinity, were “beyond” or “above” reason, and their truth could not be directly proved. The truth of these doctrines then, became dependent upon the authority of those who promulgated them. The argument from miracles was essentially that the doctrines taught by Christ and his disciples were true because they were accompanied by the working of miracles. Since miracles were supernatural—beyond or against nature—they could only be direct activities of God, wrought in order to signify the divine origin of the message being preached. Traditionally, miracles were yoked to prophecies which also functioned as “external evidences,” the two lending mutual support to each other.⁴⁷ The

⁴⁴ See, e.g., John Keill, *An Examination of the Reflections on The Theory of the Earth together with a Defence of the Remarks on Mr. Whiston's New Theory* (Oxford, 1699), 11f. and *passim*; John Edwards, *Brief Remarks upon Mr. Whiston's New Theory of the Earth* (London, 1697), 27-30 and *passim*; John Beaumont, *Considerations of a Book, Entituled The Theory of the Earth* (London, 1693), 44; William Nicholls, *Conference with a Theist*, Part II (London, 1697), 193-209; Cf. Whiston, *A Vindication of the New Theory of the Earth* (London, 1698), 30. Keill, incidentally, was himself a Newtonian, albeit one who clearly subscribed to the traditional understanding of miracles.

⁴⁵ This dilemma has been succinctly expressed more recently by Alastair McKinnon, “‘Miracle’ and ‘Paradox,’” *American Philosophical Quarterly*, 4 (1967), 309. Here he argues that when the term “miracle” is used “expressively” (to express wonder) and not “descriptively” (to describe a violation), it is difficult to see how it retains any religious force. Cf. Flew, *God and Philosophy*, 148.

⁴⁶ For a guide to the standard arguments, see Burns, *The Great Debate*, chs. 3 and 5.

⁴⁷ The fulfillment of a prophecy demonstrated the divine origin of the prophetic message, since only God has certain knowledge of future contingents. For typical statements of the dual argument see Robert Jenkin, *Reasonableness and Certainty of the Christian Religion*, 29-42; Stillingfleet, *Origines Sacrae*, Bk. II, chs. viii, ix. Jenkin

context and tendency of miracles provided important indications of their authenticity. Miracles needed to be wrought in support of a message, and the message had to be consonant with natural knowledge of divine truths.⁴⁸ For miracles to function as proofs, the hearts of the observers had to be receptive—as Chancellor Bacon had put it, “There was never a miracle wrought by God to convert an atheist.”⁴⁹ The performance of miracles, moreover, had a cumulative effect: a number of miracles performed by the same person was a more convincing display of divine power than a single miracle.⁵⁰ Finally, miracles, despite the immoderate claims of their more vocal advocates, constituted only a “moral” proof—a proof which possessed less than mathematical certainty, but to which unprejudiced men of reason would assent.⁵¹

Despite these important qualifications and safeguards, however, the basic argument still required miracles to be violations of natural laws. On the face of it, miracles in the Newtonian sense could not be substituted into these traditional arguments (as critics of the mechanistic theories of the earth had already pointed out). It is surprising, then, that those within the Newtonian clique and Clarke in particular still seemed to want to retain some apologetic role for miracles. Clarke firmly insisted that the Christian revelation is “positively and directly proved to be actually and immediately sent to us from God” on account of miracles, fulfilled prophecies, and the testimony of Jesus’ disciples.⁵² Either Clarke was dissembling, or he was using the argument from miracles in quite a new way. In a sense he was actually doing both, as we shall see. For the moment, let us turn our attention to the way in which both Clarke and Whiston developed novel strategies which enabled them to retain an apologetic use for those events commonly thought to be miracles.

First, they were able to put forward an indirect proof of the Christian revelation as contained in scripture, by actually inverting the standard argument from miracles. Spinoza, along with a number of the English “deists,” had asserted that miracles are a priori impossible. It followed that miracle narratives in scripture were not to be read literally and, if taken seriously at all, were to be interpreted in a “figurative” sense.⁵³ The upshot was that

actually notes that miracles alone are not a sufficient testimony to a doctrine: “Though miracles are a most fit and proper Means to prove the Truth of Religion; yet they are not only to be consider’d alone, but in conjunction with other Proofs” (43).

⁴⁸ *Ibid.*, 42. Cf. Augustine, *De utilitate credendi*, 16.34.

⁴⁹ Francis Bacon, *Advancement of Learning*, II.vi.1 (86). Cf. Boyle, *The Religious Virtuoso*, Works, V, 514, 524. Bentley, Boyle Lectures, 6th ed., Sermon VI, in Works, III, 125; Aquinas, *Summa theologiae*, 2a2ae. 6, 1 (XXXI, 167).

⁵⁰ See Locke, *A Discourse of Miracles*, Works, IX, 259

⁵¹ On “moral certainty,” see Wilkins, *Principles and Duties of Natural Religion*, 7-10, 88-93, and Clarke, Works, II, 600.

⁵² Clarke, *Evidences of Natural and Revealed Religion*, Works, II, 697.

⁵³ Thus Charles Blount: “For in Scripture many things are related as real, and which were also believ’d to be real even by the Relators themselves; that notwithstanding were only Representations form’d in the Brain, and meerly imaginary” (*Miracles no Violations*

Scripture, as a supposed record of divine revelation, was unreliable. The Newtonians responded by arguing that many of the remarkable events recorded in the Old Testament were consonant with the new science, and indeed were the most likely scientific explanations of certain features of the world. As we have already seen, such events as the Creation, the Flood, and the plagues of Egypt were used by the Newtonians to show that the details of sacred history were compatible with the new philosophy. But more than this, the reliability of Scripture as a whole was vindicated by demonstrating that narratives which on the face of it were highly implausible, were actually confirmed by a mechanical science. As Whiston put it:

So certainly the Establishment of the Verity of the Scriptures in the most harsh and difficult Assertions touching the Natural World (the proper Case in which the improvement of Philosophy was likely to afford means for our Determination) ought to assure us of the like verity of the same Scripture in the other Points, more peculiarly the Subjects of Divine Revelation, less capable of affording any other means of Satisfaction.⁵⁴

Clarke articulated the same argument, declaring that in the Christian scriptures alone is found a scientifically reliable account of the world's origins. "AMONG the writings of all, even the most ancient and learned Nations," he wrote, "there are *None but* the books of the *Jews*, which [have] ... given any tolerable account in particular, of the *Formation of this our earth* into its present *habitable State*."⁵⁵ Thus, despite cutting the ground from beneath the traditional argument from miracles, scientific endorsement of miracle accounts functioned like the other external evidences by attesting to the general authority of the source of a putative revelation.

A second apologetic argument proposed by the Newtonians was that, despite the fact that the causes of some "miracles" might be known, the timing and combination of various natural causes revealed the hand of God: some events are miraculous because they involve remarkable coincidences which can be given plausible religious interpretations. Thus, even granting that "miracles" are no different from other events in terms of the causation, the synchronization of these unusual events with the course of human history testified to the prescience and providential plan of God. For example, even though the natural causes of the Deluge, the plagues of Egypt, and the parting

of the Laws of Nature [London, 1683], 23). Blount's work, as Thomas Browne tactlessly pointed out, was plagiarized from Spinoza and others. Browne, *Miracles Work's Above and Contrary to Nature*, 1-3. Cf. Spinoza, *Tractatus theologico-politicus*, in *Works* (2 vols.; London, 1889²), I, 84, 92-94; John Toland, *Tetradyms* (London, 1720). Also see the arguments of "Philologus" in Nicholls, *Conference with a Theist*, Part II.

⁵⁴ Whiston, *New Theory*, 381f. Cf. Burnet's preface to *The Theory of the Earth*, Books I and II (London, 1697³).

⁵⁵ Clarke, *Evidences of Natural and Revealed Religion*, *Works* II, 705.

of the Red Sea could be enumerated, it was the fact that they were unusual, *and* had occurred precisely when they did, which made them miraculous. Why did creatures of the Nile contract their distemper at such an opportune time? Why did the Flood coincide with the growth of human wickedness? Why did the Red Sea part for the Israelites and then inundate their Egyptian pursuers? The answers to these questions could not be found solely in the examination of nature but required reference to God's purposes, or to the "moral order of the world." In Whiston's words, "the *coincidence* of things from first to last, through so many stages and periods of Nature" is what is remarkable and "miraculous."⁵⁶ And in the timing of these coincidences is to be found the reason why such "miracles" might function as evidences. God, says Whiston, "so previously adjusted and contemper'd the Moral and Natural World to one another, that *the Marks and Tokens of his Providence should be in all Ages legible and conspicuous, whatsoever the visible secondary Causes or Occasions might be....*"⁵⁷ Thus the events of history, whether we wish to style certain of them "providential" or "miraculous," all tend to the same end.

Future divine "interventions" prophesied in scripture could sustain a similar analysis. Burnet's conjectures regarding the final conflagration of the world are a clear example. Burnet considered a range of possibilities as to how this conflagration might be brought about—the earth's orbit approaching too close to the sun or the eruption of the earth's central fire—before concluding that the conflagration would be caused by a combination of volcanoes, flammable materials in the earth's core, and fiery meteors.⁵⁸ Yet despite this scientific explanation, God's hand was visible in the timing of the event: "and tho' the Causes may be sufficient when all united, yet the union of them at such a time, and in such a manner, I look upon as the effect of a particular Providence."⁵⁹

It is hard to overemphasize the significance of this account of miraculous events. By deleting all reference to breaches of laws of nature and by locating the essence of the miraculous in the concatenation of natural causes, miracle accounts could become immune to the standard criticisms which have become familiar to us since Hume's "Of Miracles."⁶⁰ Moreover, such a conception allows for a far more durable synthesis of science and religion than had been possible with the conception of nature promoted by Boyle and others. "Coincidence miracles" enable both scientific and theological descriptions to apply to the same event without competing with each other. Miracles and laws of nature could now peacefully coexist.

⁵⁶ Whiston, *New Theory*, 103 (my emphasis). Cf. Grew, *Cosmologia Sacra*, 200.

⁵⁷ Whiston, *New Theory*, 219 (my emphasis).

⁵⁸ *The Theory of the Earth*, bk. III, chs. vi, vii.

⁵⁹ Burnet, *The Theory of the Earth ... the Last Two Books*, bk. III, ch. iv.

⁶⁰ The notion of a "coincidence" miracle has been rehabilitated in the twentieth century by R. F. Holland ("The Miraculous," *American Philosophical Quarterly*, 2 [1965], 43-51).

Relative Miracles, Accommodation, and Two-Fold Philosophy

The evidence which we examined to this point is intended to show that the Newtonians rejected outright the standard seventeenth-century assumption that violations of the laws of nature can take place. However, if we set aside for the moment Clarke's "philosophical" definition of "miracle" (which a priori seems to rule out violations of the laws of nature), it might be argued that all we have established so far is that the Newtonians were skeptical about *some* accounts of miracles and that they reinterpreted these events accordingly, even going so far as to find alternative apologetic functions for them. It remains a possibility that they retained something like the standard conception of miracle, reserving it for very special occurrences. Indeed, a fair case could be made that while the Newtonians regarded the vast bulk of putative miracles as having occurred within the normal course of nature, a few dramatic events—the Creation, the miracles and resurrection of Christ, and the approaching Eschaton—these things genuinely warranted the label "miracle" as used in the traditional sense. The Newtonians, according to this interpretation, were concerned to reduce dramatically the number of events which fell under the description "miracle" but were not committed to dispensing with the concept completely.⁶¹ This interpretation derives a measure of support from the fact that Newton, Clarke, and Whiston do appear at times to concede that, during pivotal periods of history, genuine miracles had actually occurred.

For example, Newton wrote to Burnet in 1680, speculating about the days of the Creation: "Where natural causes are at hand God uses them as instruments in his works, but I doe no think them alone sufficient for ye creation & therefore may be allowed to suppose that amongst other things God gave the earth it's motion by ... degrees."⁶² Whiston was similarly persuaded that God acted directly in the formation of the sublunary world, but thereafter rested: "The days of creation are signally distinguish'd from those following, in which God is said to have rested (when yet his ordinary Concurrence and the Course of nature was continued without Interruption) and must be reckon'd as such on which he truly exerted a Power different from the other."⁶³

A second period in which the Newtonians seem to allow genuine miracles was the apostolic age, when Jesus and his disciples wrought various wonders. Newton wrote to Locke in 1691-92 that "Miracles of good credit continued in the Church for about two or three hundred years."⁶⁴ The more

⁶¹ James Force, for example, writes that "Like Whiston,... Clarke ultimately commits himself, however reluctantly, to the possibility of miracles as transgressions of natural law by a specially provident God" ("The Breakdown of the Newtonian Synthesis," 149).

⁶² Newton to Burnet, January 1680/81, *Correspondence of Isaac Newton*, II, 334.

⁶³ Whiston, *New Theory*, 211.

⁶⁴ Newton to Locke, 16 February 1691/92 (*Correspondence of Isaac Newton*, III, 195).

outspoken Whiston wrote a complete work expressing the same point of view—that miracles began with Christ and ceased “just at, or after the second General Council, that of Constantinople.”⁶⁵ The waning of miracle-working had additional significance for the Newtonians. The denial of contemporary miracles was an important component of anti-Catholic polemic. With the cessation of wonders all Romish miracles, and indeed all purported miracles enlisted in support of other revelations, could be discounted as impostures.⁶⁶ Moreover, the withdrawal of the gift of miracle-working from the Church coincided with the ascendancy of Athanasian theology and its triumph over Arianism—the preferred trinitarian view of Newton, Whiston, and Clarke.⁶⁷ For the Newtonians the cessation of miracles was thus in part a token of divine disapproval of what became the orthodox theological position with respect to the Trinity.

Finally, the third “age of miracles,” in which laws of nature would undergo an apparent change, was the Eschaton. Whiston observed that “The state of Nature during the *Millenium* will be very different from that at present.”⁶⁸ Newton himself had suggested, notoriously, that the present solar system would eventually grind to a halt, requiring the direct intervention of God to reform it—a reformation which, incidentally, Newton most probably regarded as the destruction and renovation of the earth prophesied in Scripture.⁶⁹

All of this seems to favor the view that in the final analysis Newton, Whiston, and Clarke were still committed to the traditional view that miracles, *qua* violations of the laws of nature, could take place, albeit not with the frequency claimed by their more enthusiastic advocates. These passages, however, need not support the “ambiguity and inconsistency” hypothesis. The key to reconciling these admissions with what appears to be an outright rejection of miracles in other places is provided by an understanding of Clarke’s motivation in providing two apparently contradictory definitions of “miracle.” Clarke, we recall, stated that miracles in the “philosophical” sense, cannot be violations of the laws of nature (because there is no such thing as the course of nature), nor can they be singular interpositions of Divine power (because God’s immediate power is constantly operating in the universe). Once Clarke’s “philosophical” definition of miracle is accepted, no event, in principle, *can* be an objective miracle, including the signs and wonders recorded in the New Testament. At best there can be events which

⁶⁵ Whiston, *Mr. W.’s Account of the Exact Time when Miraculous Gifts Ceas’d in the Church* (London, 1749), 7. Cf. Whiston’s *A Collection of Authentic Records belonging to the Old and New Testament* (London, 1727-28), 939-48, and *An Account of the Daemoniacs* (London, 1737), 59-73.

⁶⁶ Whiston, *Ibid.*, 9-11.

⁶⁷ Whiston, *Ibid.* Also see Westfall, *Never at Rest* (Cambridge, 1980), 345.

⁶⁸ Whiston, *New Theory*, 214.

⁶⁹ Newton, *Optics* (New York, 1952⁴), 402; David Kubrin, “Newton and the Cyclical Cosmos,” *JHI*, 28 (1967) 325-46.

are miracles for us—*miraculum quod nos*, to use the phrase of Aquinas—in that we are, at some given point in time, unable to offer explanations of their causes. The reason Clarke also provides an apparently contradictory definition of miracles which alludes to the interposition of God is not on account of a failure of nerve on his part, but because of a commitment to notions of “accommodation” and the “two-fold philosophy.”

According to the principle of accommodation, God and his messengers had, throughout the course of history, “accommodated” divine revelations to the conceptions and mental capacities of the recipients of those revelations. Miracles, *qua* apparent interpositions into the natural order, are evidence of divine accommodation in that they have an immediate appeal to people of all capacities. Had Judeo-Christian religion been exclusively for those cognoscenti capable of grasping the truths of natural religion, along with a variety of intricate theological dogmas, miracles would have been unnecessary. However, for those of more modest intellect—the simple and the illiterate—miracles could provide a convincing demonstration of “supernatural” power.

The appeal of miracles to those lacking intellectual gifts had already been noted by a number of theologians. Augustine had disparagingly remarked that miracles were not for the wise but for fools who were more inclined to rely upon their senses than their intellects.⁷⁰ Twelve hundred years later Robert Boyle, while less dismissive of the miraculous, nevertheless pointed out that “Miracles are a proper way to appeal to men of all capacities; subtle arguments may convince philosophers, but Christianity is meant for all men.”⁷¹ Locke, too, had stressed that miracles must appeal to “all sorts and degrees of people,” not least “the simple and illiterate,” and that consequently it was their *apparent* contradiction of the normal course of nature which was crucial.⁷² Newton, Burnet, Whiston, and Clarke all assumed similarly that the vulgar throughout history either failed to comprehend the standing miracle evident in the natural course of things, or had simply lost their awe of the wonders of nature through familiarity. Miracles, in the sense of unusual events, were necessary for such people and indeed were a mark of God’s accommodation of his message to the capacities of its intended recipients.⁷³

⁷⁰ Augustine, *De utilitate credendi*, 16.34.

⁷¹ Boyle, unpublished MS, “Some considerations about Miracles as they are Pleasable for the Christian Religion,” quoted in R. M. Burns, *The Great Debate*, 53.

⁷² Locke, *Discourse of Miracles*, Works, IX, 264. Cf. Fleetwood, *Essay upon Miracles*, 78f.; Conyers Middleton, *A Free Inquiry into the Miraculous Powers which are supposed to have subsisted in the Christian Church* (London, 1749), xli.

⁷³ See, e.g., Newton to Burnet, January 1680/1 (*Correspondence of Isaac Newton*, II, 331); Burnet to Newton, 13 January 1680/1 (*Correspondence of Isaac Newton*, II, 323). Cf. William Nicholls, *A Conference with a Theist*, Part IV (London, 1699), 238f.; Abraham Lemoine, *A Treatise on Miracles* (London, 1747), 359.

A further consequence of the principle of accommodation was that if the capacities of the human race had changed over time, God's methods of self-communication would alter accordingly. In an age of advancing science the need for miracles was far less, and not only because scientific explanations could be offered for events previously thought to be miraculous. For Newton and his peers the ordering of nature itself was sufficient testimony to the sovereignty of God; for the scientifically immature, unusual events performed the same function. As John Cockburn expressed the matter:

Under the Patriarchal and Jewish Oeconomy, God did reveal himself more frequently than now: The Jews had a succession of Prophets.... This Privilege is withdrawn now, not because God careth less for the World, but because there is not such occasion for it now, as then: To omit other Reasons at this time, Men were then in a kind of Infant-state, they did not understand clearly either the Methods of Providence, or God's Will and Purpose towards Mankind....⁷⁴

Improvements in knowledge, the most important of which was arguably was Newton's discovery of the law of universal gravitation, had not only made many miracles scientifically explicable, but had uncovered the miraculous nature of the everyday workings of the universe, making "miracles" superfluous. The march of science had indeed nullified the concept, but fortuitously had at the same time provided a more sophisticated alternative.

It is important to note that while Clarke, Whiston, and Newton were all very conscious of the scientific progress made since the writing of the Pentateuch, they nonetheless realized that the seventeenth-century natural philosopher was only relatively better off than the rude Israelites to whom Moses had first expounded the history of the Creation. While the Newtonians insisted that in principle no event could be a true miracle, they could concede that certain remarkable events still evaded scientific explanation. It is for this reason that they use the familiar language of miracles for the Creation and the Eschaton. But as Clarke was at pains to point out to Leibniz, this usage requires careful analysis. The latter, as is well known, took exception to Newton's claim that the irregularities in the solar system, owing to the mutual attractions of the various bodies, "will be apt to increase, till this system wants a Reformation...."⁷⁵ Leibniz objected that this reflected rather badly on the Creator, who must have lacked foresight in framing the laws of the universe.⁷⁶ Clarke sprang to the defense of Newtonian science, explaining to Leibniz that "the word *correction*, or *amendment*, is to be understood, not with regard to God, but to us only." He continues:

⁷⁴ John Cockburn, *Enquiry into the Nature, Necessity and Evidence of Christian Faith* (London, 1699²), 187. Cf. John Donne, *Essayes in Divinity*, 84; Alexander Calcott, *A Treatise on the Deluge* (London, 1768²), 10; Conyers Middleton, *Free Enquiry*, cxii.

⁷⁵ Newton, *Optics*, 402.

⁷⁶ *Leibniz-Clarke Correspondence*, 11.

The present frame of the solar system (for instance,) according to the present laws of motion, will in time fall into confusion; and perhaps, after that, will be amended or put into a new form. But this amendment is only relative, with regard to our conception. In reality, and with regard to God; the present frame, and the consequent disorder, and the following renovation, are all equally parts of the design framed in God's original perfect idea.⁷⁷

God interferes or interposes to reform the solar system but only with respect to our limited scientific conceptions—our *present* laws of motion as Clarke tellingly describes them. There will be nothing of the genuine miracle in the dissolution of our solar system, merely the operation of “natural” forces as yet not fully understood. All events, without exception, are part of “God's original perfect idea,” and inasmuch as science, for the Newtonians at least, was directed at the discovery of these divine ideas, all events, without exception, fall under the purview of science. Whiston gave a similar account of the Eschaton: “this Catastrophe may naturally and regularly befall our Earth ... according to the true system of the World, and without a miracle.”⁷⁸ Even the “miraculous” resurrection of human bodies which was to coincide with the end of the world was, in Whiston's view, “very agreeable to some known Phenomena of Nature.”⁷⁹ By implication, the references of Whiston and Newton to “direct” divine activity in the original Creation are to be similarly understood as “interventions” from our limited perspective only. Miracles thus have epistemological, and not ontological status.

Clarke's dual definition is rendered even more explicable when we take into account the “two-fold philosophy,” itself a fundamental assumption of the principle of accommodation. Subscription to the two-fold philosophy was almost universal amongst the learned of the seventeenth century and involved the view that in science and religion, indeed in all spheres of learning, there are two forms of knowledge, one for the vulgar and one for the learned. It was more or less a synchronic version of the theory of accommodation, according to which there would be in every age, despite the advance of science, those who required a simple version of events. In the spirit of the two-fold philosophy Newton wrote of the philosophers of the past that they “loved so to mitigate their mystical discourses that in the presence of the vulgar they foolishly propounded vulgar matters for the sake of ridicule, and hid the truth behind discourses of this kind.”⁸⁰ As we have seen, Moses, too, practiced the two-fold philosophy, writing an “unfeigned” yet “unphilosophical” account of the Creation. Even the Fathers of the Church had succumbed to this tendency, propounding two versions of Christianity. “The

⁷⁷ *Ibid.*, 22f.

⁷⁸ Whiston, *Astronomical Principles of Religion*, 153.

⁷⁹ *Ibid.*, 152.

⁸⁰ Newton, Gregory MS. 247, fols. 11f. Also see Frank E. Manuel, *The Religion of Isaac Newton* (Oxford, 1974), 39, 46.

multitude,” averred Origen, “cannot comprehend the complex theology of the wisdom of God” and must settle for “the *ipse dixit* of Jesus.”⁸¹ Thus it was not without precedent that the learned of the seventeenth century withheld their speculations on sensitive doctrinal matters from *hoi polloi*.⁸² Thomas Burnet, for instance, felt at liberty to express his doubts about the eternity of hell in a Latin work but cautioned his reader that “whatever you decide in your own Breast of these Eternal Punishments, the people, too easily prone to Vice and easily terrified from Evil must have the commonly received Doctrine.”⁸³ Whiston characteristically admitted to a similarly liberal view of the torments of hell and even confided to his readers that both Clarke and Newton (neither of whom had seen fit to make public their opinions on this issue) shared his views.⁸⁴ Newton, as is well known, also kept his Arian views private and even went so far as to prevent the admission of his friend Whiston into the Royal Society on account of Whiston’s ingenuous admission of a commitment to that trinitarian heresy. Whiston’s offence was clearly not his Arianism per se but the politically-fraught public profession of a heterodox creed.

It is hardly surprising, given an intellectual culture of this kind, that Clarke would deem it necessary to at least give a nod in the direction of the “commonly received doctrine” concerning miracles, secure in the knowledge that it was a harmless way of looking at events which did have, subjectively at any rate, religious significance. To waver on this issue, in any case, would have been to play into the hands of the deistic proponents of natural religion, whose desire it was to do away with revelation altogether. The religious establishment would certainly have taken a dim view of any attempt to undermine its chief bulwark against deism—the argument from miracles. Thus, whereas in one sense the age of miracles was over, in another it was necessary for religious and political reasons to perpetuate the concept. For much the reason as Moses had propounded a non-philosophical account of the Creation, so the Newtonians reluctantly promoted a “theological” conception of the miraculous. The true position of Clarke, Whiston, and Newton is most expressly stated in the controversy with Leibniz (the arguments of which Newton personally supervised).⁸⁵ In the more public Boyle

⁸¹ Origen, *Contra celsum*, IV.9, I.7; cf. *De principiis*, IV.ii.6-8; Basil, *On the Spirit*, XXVII.66.

⁸² “Even still,” wrote Whiston, “those who believe in the true System of the World, are forc’d among the Vulgar, and in common Conversation to speak as they do, and accommodate their expressions to the Notions and Apprehensions of the the generality of Mankind” (*New Theory*, 20).

⁸³ Burnet, *Of the State of the Dead and Those that are to Rise*, tr. M. Earberry (2 vols; London, 1728²), II, 97. Burnet also indicated in the Latin original that he would take a dim view of any attempt to translate his work into the vernacular...a caution which Earberry blithely ignored.

⁸⁴ Whiston, *The Eternity of Hell Torments Considered* (London, 1740), 1f.

⁸⁵ See Cambridge University Library, Add MS. 3965, fol. 289r, draft D, for evidence of Newton’s editorial input into the publication of the Clarke-Leibniz correspondence.

lectures Clarke had to tread more warily—hence his inclusion of a “theological” definition of miracles which was somewhat at odds with the philosophical account he had already outlined.

None of this is to say, however, that Newton and his disciples embarked on a campaign of deliberate duplicity. Clarke, for instance, was privately aware that for even the most sophisticated philosophical thinker it was helpful at times to think of certain events *as if* they were interpositions on the part of the Deity. To call an event a “miracle” was to invest it with a special theological significance, and this was something which, for religious reasons, it was at times desirable to do. This view of the psychological necessity of retaining the more traditional use of “miracle” was shared by Whiston. In a vindication of his account of the causes of the Deluge. Whiston addressed those numerous critics who argued for the incompatibility of mechanistic and miraculous explanations: “’Tis *alleg’d against me, That my Mechanical Account of the Deluge implies it was no divine Judgement for the World’s Wickedness; but from the Necessary Motion of the Comet and Earth, must have happen’d whether men had repented or not.*”⁸⁶ Whiston responded that neither a scientific nor a moral account of the deluge are by themselves exhaustive explanations of the event. God in his prescience knew of the future sinful actions of men and so determined to punish them. The instruments of his judgment, however, were the natural causes which brought the deluge-inducing comet. It was true *both* that God punished a sinful human race by sending a flood *and* that the flood was inexorably brought on through the operation of secondary causes. In other words it was *as if* God had interposed.

In an illuminating passage, Whiston goes on to explain that a comparable situation exists with respect to petitionary prayer. When we pray to God to bring about a future state of affairs, says Whiston, we must act as if God will literally intervene in the natural course of events—“it is best to suppose ... in our Devotions” that our prayers depend upon a “*particular Interposition of Providence.*” In offering petitionary prayers we act as if our prayers will function in some way as causes of future contingent events. From a philosophical (as opposed to a devotional) perspective, however, we know that such a belief is highly problematic. The philosophical explanation of petitionary prayer is that God, knowing from the beginning of time what petitions will be offered, so arranges matters that those things we pray for occur in accordance with nature, and thus these events will inevitably take place, albeit in a rather special sense, “in response to” our prayers.⁸⁷ This notwith-

⁸⁶ Whiston, *A Vindication*, 30. The critic was William Nicholls (see his *Conference with a Theist*, Part II [London, 1697], 207).

⁸⁷ We find similar solutions in Augustine *De civitate dei*, V.9, 10, and Aquinas *Summa contra gentiles*, III, 95. Cf. William Wollaston, “And thus the prayers, which good men offer to the All-knowing God, and the neglects of others, may find fitting effects already forecrafted in the course of nature” (*The Religion of Nature Delineated* [London, 1724], 104).

standing, it is not unreasonable to maintain a distinction between a philosophical and a devotional perspective on petitionary prayer.

The same might be argued for miracles. Whiston concludes, although the argument is hard to disentangle from the prolix prose, that the two key notions of “the particular interposition of providence” and “miracle” amount to the same thing—as will become apparent, he assures us, when “the other parts of Nature yet to be discover’d, be found reducible to as fixt Laws as those we already know are.”⁸⁸ In other words we only speak of miracles and particular interpositions because we are ignorant of the fixed laws which account for such events, just as we remain ignorant of the laws governing the natural means by which prayer requests are granted. In short we are similarly placed to those who in previous ages, through a lack of knowledge of nature, attributed to divine interposition what we now know to have been natural. All miracles, then, are relative miracles.

Conclusion

The heroes of seventeenth-century science inhabited a thought-world very different from our own. However sophisticated their scientific visions of the universe, they often found themselves unable to jettison aspects of a past world, a world populated by occult forces, sympathies and antipathies, and the influences of supernatural beings. Men of the highest scientific reputation could still cling to the vestiges of medieval beliefs: witches, alchemy, astrology, and not least, miracles. From our contemporary perspective we are inclined to view many such beliefs, including the belief in miracles, as inimical to the scientific outlook. Accordingly, we tend to regard these men as having been faced with a stark choice: science or miracles but not both. It is because Newton and a number of his friends found themselves unable to make that choice that they stand charged with having embraced ambiguities and inconsistencies. I have argued that Newton, Whiston, and Clarke rejected this dichotomy and established a firm middle ground, allowing that those events traditionally labelled “miracles” had taken place, but denying that any philosophical sense could be made of the claim that they were breaches of natural law. This new conception of the miraculous was most successfully applied by Newton’s protégé Whiston to the Deluge and the final Conflagration.

In an unpublished manuscript on the apocalypse Newton, speaking of the final restoration of the world, declared that nothing is “beyond the possibility of nature, nothing too hard for the omnipotent power of God”: the possibilities of nature, for Newton, were nothing less than the possibilities of

⁸⁸ Whiston, *A Vindication*, 31. Compare Burnet’s response to the same criticism, *An Answer to the Late Exceptions made by Mr Erasmus Warren against the Theory of the Earth* (London, 1690), 17-19.

the omnipotent Deity.⁸⁹ With such a conception of the ordering of the cosmos there could be no divine “violation of laws of nature.” Newton did not, and could not, believe in miracles in this sense. Yet committed as he was to the omnipotence of God, Newton was open to the “strange and wonderful”—those prodigies which in past ages, and even in his own times, men had referred to as “miracles.”

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⁸⁹ Yahuda MS. 9. 2, fol. 140r. Quoted in Manuel, *Religion of Isaac Newton*, 101.