

Isaac Newton (1642-1727): Natural Philosopher, Biblical Scholar and Civil Servant

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Newton was born on Christmas Day 1642 into a world of ascendent Puritanism. An explosion of sectarianism, prophetic fervor and Calvinist moral austerity sent shock waves through England during the earliest years of his life, as did the concomitant upheaval of the Civil Wars. The young lad also saw his domestic world turned upside down. His father Isaac, an illiterate yeoman, was laid in a humble grave three months before Newton's birth at Woolsthorpe manor in Lincolnshire. Three years later Newton suffered a second loss when his mother married an elderly clergyman and moved to his parish, leaving Isaac behind. Widowed again in 1653, she returned to Woolsthorpe. In 1655 Isaac was enrolled in the King's School, a grammar school in Grantham seven miles to the north. There Newton was fed a diet of Latin heaped on Latin, a helping of Greek and a pinch of Hebrew, but virtually no mathematics. At the core of his education was a solid grounding in the Word of God and the Protestant faith. Eventually he rose to the top of his class and was encouraged by the schoolmaster to prepare for university. In 1661 he arrived among the spires and courts of Cambridge—his home for the next thirty-five years. Unsubstantiated evidence has Newton engaged to his Grantham landlord's daughter. If so, this was soon forgotten as he embarked on the life of a solitary scholar.

Although his mother was better off than many gentlemen, Newton was enrolled as a lowly sizar, which entailed the performance of menial duties for the Fellows and more genteel members of Trinity College, where he matriculated. Here his formal education diverged little from the Medieval curriculum and concentrated on Aristotle, Plato, logic, rhetoric, religion and chronology. But Newton soon began to imbibe in the new mechanical philosophy, turning to the works of Copernicus, Galileo, Kepler, Descartes, Hobbes, Boyle, and Cambridge's own Henry More. Following their example he took up experiments and began to carry out observations of the heavenly bodies. Rumor has it that he placed second in the B.A. examinations of 1665; the evidence of his extra-curricular readings shows that he had already outstripped most of the tutors in modern learning.

In 1665 the plague descended on Cambridge and the University was closed. Newton returned to Woolsthorpe where his voyage of discovery continued. It was here, Newton said, that he saw the apple fall and received his first insight into universal gravitation, thus laying the foundation for his work in physics. Here he also completed his work on the calculus, allowing him to solve problems involving curves and rates of change of points moving along them, thereby solving elegantly a problem that had long plagued mathematicians. And here he also performed revolutionary optical experiments with refraction that demonstrated the heterogenous nature of light. Excepting a brief return to Cambridge in 1666, he spent the better part of two years at home, a period rightly described as his *anni mirabiles* and one he himself called "the prime of my age for invention".

Back at Cambridge in the spring of 1667, Newton competed successfully for a fellowship at Trinity. His position at Cambridge was now secure. He took his M.A. in 1668 and in 1669 was appointed Lucasian Professor of Mathematics. Although this new academic chair had acquired none of the prestige it enjoys today, it was a step up in rank. He delivered his first lectures on optics.

By 1671 Newton had developed the first working reflecting telescope, which was shown to the Royal Society late that year and afterwards to the King himself. In 1672 Newton sent the Society his revolutionary discoveries on optics, which were promptly published in the *Philosophical Transactions*, the Society's journal. These included his prism experiments and his *experimentum crucis*, which demonstrated that light refracted into the various homogenous colors of the spectrum does not further divide. Newton was rewarded with both fame and controversy. Robert Hooke, the Society's Curator of Experiments, expressed doubts. Philosophers on the continent who were unable to replicate the experiments attacked him. Impatient and hostile in his responses, he charged his critics with placing too much weight on philosophizing and not enough on experiment. Nor was it lost on him that his chief European opponents were Jesuits, a society the anti-Catholic Newton believed was given to cavil and dispute.

Newton had by now been attracted to the crucible of alchemy. He had taken notes on works by such "chymists" as Boyle in the mid-1660s; in 1669 he bought two furnaces, some chemicals and the six-volume alchemical compendium *Theatrum chemicum*, and began to experiment himself. Soon he became involved in secretive alchemical networks and copied out unpublished treatises passed around in these circles. The precise nature of his alchemical studies is debated but he apparently saw in alchemy evidence of divine activity in matter that could serve as an antidote to the extreme mechanization evident in such philosophies as Cartesianism. He drank deeply of alchemy's religious symbolism and agreed with its teachings about a general *renovatio* in both matter and humanity. Some scholars now believe that Newton's concept of attraction owed much to alchemical thought.

Newton's fellowship required him to seek ordination within eight years. As the deadline neared he began to study theology, prophecy and church history in earnest. Newton scoured the Fathers of the early church, analyzed the creeds and combed the annals of ecclesiastical history. The result was the discovery that the doctrine of the Trinity was a pagan corruption imposed on primitive Christianity in the fourth century by Athanasius. Newton faced a dilemma: a man of conscience, he could not now take holy orders, but to express the reason why would have led to his immediate and ignominious expulsion from the University. Newton had been prepared to resign when a special dispensation came from Charles II exempting Lucasian Professors from ordination. Newton was safe. Nevertheless, until his dying day he lived the life of a secret heretic, outwardly conforming to Anglicanism while inwardly denying many of its articles.

Newton looked forward to a thorough reformation that would restore primitive Christianity—a stance that signals his distance from his Protestant contemporaries. For more than half a century he studied history and theology to purge Christianity of its corruptions. This research exhibited his commitment to the Renaissance commonplace that the ancients had once possessed true knowledge about God and the world. Retrieving this *prisca sapientia* was his great life's work. A massive manuscript ecclesiastical history was one but product of this effort. He also sifted through biblical and Talmudic sources to reconstruct the plan of the Jerusalem Temple because he believed that it and its rituals provided a backdrop to the visions of the Book of Revelation but also because it and other ancient temples modeled a heliocentric solar system—knowledge lost in antiquity.

Newton discovered in the Scriptures that the Father alone is God. Jesus Christ, pre-existent and miraculously born, was God's Son but not ontologically God in any Trinitarian sense. Although Newton's Christ is not to be worshiped or invoked in prayer, he occupies an elevated position through the atonement wrought by his blood and because of his apocalyptic role at the end of time. Newton had nothing but disdain for the monks and Trinitarians whom he thought had corrupted the

pure teaching of God with metaphysics and doctrinally novel terms. These same agents of false doctrine introduced the unbiblical notion of the immortality of the soul to underpin Catholic saint worship. For Newton, eternal life is granted to the faithful only after resurrection. Nor did the orthodox demonology stand before Newton's reformation. Evil spirits came to represent distempers of the mind, the Devil, human lust. Far from pointing to some incipient rationalism, his rejection of demons likely derives from the logic of his radically monotheistic belief in a God whose absolute dominion does not brook lesser rivals. In religious outlook, Newton's thought resembles contemporary Non-Conformity and shows strong doctrinal analogies with Judaism, pre-Nicene Christianity and contemporary biblicist anti-Trinitarian Socinianism.

Newton was not only interested in the past but in the future foretold in the Christian prophecies. In the 1670s he wrote the first of several large prophetic treatises in which he sought to uncover the symbolism of the Books of Daniel and Revelation, along with their fulfillments in history past and future. Newton was no deist but one who found in the exact and literal fulfillment of prophecies a powerful argument for the existence of the God of the Bible. Strongly premillenarian in eschatology, he believed in the return of Christ, the restoration of the Jews to Israel, the rebuilding of the Temple and the coming of the Kingdom of God on earth—for which he thought believers should daily pray.

All of this research was carried out in private. Not only was denial of the Trinity a punishable offense, but Newton believed that the higher truths of religion were not fit for the masses. He did, however, reveal his heresies to similarly-minded friends such as John Locke, who described him as a “very valuable man not onely for his wonderful skill in Mathematicks but in divinity too and his great knowledg in the Scriptures where in I know few his equals”. The two men also discussed biblical prophecy. In the early 1690s, Newton came close to publishing anonymously and on the continent an anti-Trinitarian treatise through Locke. This was suppressed at the last moment and, aside from some rumors that circulated late in his life, few contemporaries knew that the great Isaac Newton was a heretic.

In August 1684, Edmond Halley laid before Newton a problem which he had discussed with Hooke and Sir Christopher Wren. Could Newton demonstrate why a planet should move in an elliptical orbit when acted upon by a force of attraction from the sun that decreases in an inverse proportion to the square of the distance between the two bodies? Newton said he had solved the problem but he could not find his calculations. In November, Halley received from Newton a nine-page manuscript set of calculations entitled “De motu corporum in gyrum” (“Concerning the movement of revolving bodies”). Halley immediately recognized it as nothing less than the beginnings of a new physics. It built upon his study of the comets of 1680 and 1682, which had convinced him that heavenly bodies meet no resistance from an aether and that comets, like planets, travel about the sun in closed elliptical paths. “De motu” shows that Newton had finally dropped the Cartesian doctrine of fluid vortices. But “De motu” also spurred Newton into giving a more complete answer to Halley's question. After a fury of activity which lasted almost two years he finished his *Philosophiae naturalis principia mathematica* (*Mathematical principles of natural philosophy*, 1687, 1713, 1726).

Book I lays out the foundations of Newton's system of mechanics, treating of the movement of bodies without resistance and identifying gravity as the force operating on moving bodies in space. Book II tackles the problem of the motion of fluids and the movement of solid bodies through fluids. Book III demonstrates how the law of gravitation operates consistently on moving bodies throughout the universe. Included in this great book is his inverse-square law of gravitation and his now famous

three laws of motion. Newton had produced a new general theory of dynamics set out in mathematical language. It was the most revolutionary book in the history of science.

What most readers did not know was that Newton saw his *magnum opus* less as a book of discovery than the recovery of ancient wisdom long since lost. What is more, Newton believed his universe could only be sustained through the providence of God and that his physics confirmed the argument from design. In a 1692 letter to Richard Bentley he acknowledged: “When I wrote my treatise about our System I had an eye upon such Principles as might work with considering men for the believe of a Deity & nothing can rejoyce me more than to find it usefull for that purpose”. His theology was present in other ways as well. The four rules of reasoning he developed through the three editions of the work, rules often seen as emblematic of scientific induction, were modeled upon sixteen rules of prophetic interpretation he had drafted in the previous decade. He relied on induction because he believed God guaranteed simplicity in nature. This was all of a piece for a man who believed that an integral constituent of the original religion was the study of nature. For Newton there was no cognitive barrier between the study of God and the study of His creation.

For some readers the *Principia* itself seemed divine. Even the less than pious Halley declared in his introductory Ode: “Nearer to the gods no mortal may approach”. For most, the work seemed almost impossibly difficult. Impenetrability is a feature of many revolutionary works, but the difficulty with the *Principia* was intentional. He later confessed that he had “designedly made his *Principia* abstruse” so as to sideline “little Smatterers in Mathematicks” even while he reached the “able Mathematicians”. As with his heretical theology, Newton revealed his analysis only to the adepts.

The publication of the *Principia* coincided with a more assertive and public phase of Newton’s career. In 1687 as King James II moved to introduce Catholics into the English universities, Newton defended the right of his University not to grant an M.A degree to a Benedictine monk. In 1689, after the Glorious Revolution, he was elected MP for Cambridge University. He thus sat in the Convocation Parliament and voted with the majority to declare the throne vacant, a necessary step to the accession of William and Mary. During this period Newton had his first sustained contact with the upper echelons of London society. Soon the grand metropolis would become his home. Newton arrived in London in 1696 to become Warden of the Royal Mint. In 1699 he became Master, a position he held until his death. In both posts he revealed a gift for administration. He spent long hours at the Mint, dramatically increasing production and directing it through a major recoinage. Counterfeiters were prosecuted with the same zeal with which he wrote against doctrinal forgery; several “coiners” were sent to the gallows under his regime. In 1703, with his old foe Hooke dead, Newton was elected President of the Royal Society. Newton set out at once to restore its intellectual vitality and redirect its focus back to experiment and natural philosophy. In 1705 he was knighted to help him oust a Tory incumbent MP at Cambridge in the general election of that year. This he failed to do, but the title and honor remained.

In 1704 Newton published his *Opticks*. Based on his Lucasian optical lectures, a 1675 paper and some new material, Newton had waited to release this book until the death of Hooke, who had criticized his earlier efforts in optics. Written in English and more experimental than theoretical, this book reached a great international audience and became the methodological guide of enlightened empirical scientists.

Assertiveness showed in other ways. He ruled the Royal Society like an autocrat, treating it as his institution. In 1713 he appended to the second edition of the *Principia* the General Scholium, which affirmed God’s continual intervening providence in nature as well as an encoded critique of

Trinitarian hermeneutics. The Scholium also attacked Descartes' theory of vortices and Leibnitz' cosmos, which did not require particular providence for its operation. A philosophical debate between Leibnitz and the Newtonian Samuel Clarke ensued. Newton also challenged Leibnitz' claim to priority in the discovery of calculus. Petty disputes continued with John Flamsteed, the Astronomer Royal, until he, like Hooke and Leibniz, succumbed to mortality.

For Newton the end came on 20 March 1727. Anticipating his death, he evidently began to think of his image in posterity. Before his final illness he burned a number of his manuscripts. His last days he spent preparing for publication his *Chronology of the ancient kingdoms amended* (1728), a work which excised four centuries from received chronologies of ancient Greece. As an incredulous Voltaire reported, Newton confessed on his deathbed that he had "never had intimacies with a woman". He also refused the sacrament. No act of irreligion, this was likely a rejection of the idolatrous, Trinitarian Church of England in whose communion he had so long uneasily remained. But these were private matters. Newton's funeral was a very public affair conducted with pomp and ostentation. Interred at Westminster Abbey, six noblemen served as his pall bearers. Voltaire, in attendance, marveled that he had been "buried like a king who had benefited his subjects". The monument erected over his tomb shows Newton reclining on four books representing the range of his thought: the *Opticks*, the *Principia*, theology and chronology. The inscription below concludes with the doxology: "Let Mortals rejoice That there has existed such and so great an Ornament to the Human Race."

The Enlightenment conception of heavenly bodies in the Newtonian planetary system travelling unhindered through empty space guided by nothing but well-ordered laws is still dominant today. Newton seemed the perfect icon for a rational, secular age. But this image is a mirage. The materialistic version of the universe constructed by the *philosophes* is one from which the great man himself would have shrunk back in horror. Isaac Newton was not an Enlightenment man. Newton's firm conviction in the argument from design, fierce opposition to scepticism and atheism, along with his fervent belief that he had recovered the lost wisdom of the ancients are not of the Enlightenment cast. Above all, his profound piety, biblicism and prophetic faith reveal his great distance from the classical Enlightenment. The British Enlightenment, which unlike its French counterpart included a religious orientation, is a somewhat different matter. But even in Augustan Britain, many aspects of his thought, including his heresy and commitment to the *prisca* tradition, remained largely hidden. Newton was known in Britain primarily through popular broadsheets, simplified textbooks and coffeehouse demonstrations of his optics and physics; these accounts rarely focused on the faith of the man. And the great outpouring of verse commemorating his life in the early years following his death is more deistic than Christian in tone. The Newton venerated in eighteenth-century Britain differed only by degrees from the Newton apotheosized in France. For most, Newton was a celebrated natural philosopher, a man of affairs, but not a religious thinker. Ironically, by keeping his most of his theology private, Newton himself bears part of the blame for his posthumous secular legacy.

When Voltaire in his *English Letters* (1733, later published as *Lettres philosophiques*, 1734) mentioned Newton's denial of the Trinity, he believed he was demonstrating the great man's rationalism even though the same year appeared Newton's *Observations on the prophecies of Daniel, and the Apocalypse of St. John*, a text that played a minor role in the rise of Protestant fundamentalism. It was easy to ignore this work or to suggest as did the abbé Conti that Newton was brilliant only as a natural philosopher and not as a historian and chronologist; there his failing were all too apparent. Others explained the theology away. Pierre-Simon de la Place and Jean-Baptiste

Biot publicized a story that Newton had suffered an intellectual derangement after his 1693 breakdown, after which he turned to the study of theology. The Enlightenment desacralized the Newtonian universe. This process culminated in the work of Laplace who, hailed as the “Newton of France”, famously told Napoleon that in his own physics he had no need of the hypothesis of God. Only now are scholars beginning to study Newton’s manuscript corpus of one million words on alchemy and four million on theology to reconstruct a holistic view of the man in which his theology and natural philosophy are seen as equally important elements of the same grand unified project, the restoration of man’s original pristine knowledge of God and the world.

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Published in *Encyclopedia of the Enlightenment*, ed. Alan Charles Kors.
Oxford University Press, 2003, vol. 3, pp. 172-7