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ARISE SIR ISAAC! NEWTON'S LONDON CAREER

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The Indian Emperor. Or the Conquest of Mexico. As performed in the year 1731 in Mr Conduitt's, Master of the Mint, before the Duke of Cumberland &c. Act 4, Scene 4 by William Hogarth (1731-2)

Isaac Newton is celebrated throughout the world as a great scientific genius who conceived the theory of gravity and revolutionized optical science. But in his early fifties, he abandoned his life as a reclusive scholar at Cambridge to spend three decades in London, a long period of metropolitan activity that is often overlooked. Enmeshed in Enlightenment politics and social affairs, Newton engaged in the linked spheres of early science and imperialist capitalism. Instead of the quiet cloisters and dark libraries of Cambridge's all-male world, he now moved in fashionable London society, which was characterised by patronage relationships, sexual intrigues and ruthless ambition. An eminent Enlightenment figure who had twice served as an MP, Newton liaised with international visitors and mingled among elite circles of the Hanoverian aristocracy.

Knighthood by Queen Anne, and a close ally of the influential Earl of Halifax, Newton occupied a powerful position as President of London's Royal Society. He also became Master of the Mint, responsible for the nation's money at a time of financial crisis and himself making and losing small fortunes on the stock market. A major investor in the East India Company, Newton benefited from the global trading networks that relied on selling African captives to wealthy plantation owners in the Americas and was responsible for monitoring the import of African gold to be melted down for English guineas.

Newton has a reputation for frugality, but during his London career he became extremely wealthy and lived comfortably. Judging from the number of portraits he commissioned, he was a vain man who could afford expensive artists such as Godfrey Kneller and David Le Marchand. His estate at death was worth £32,000 (many millions in modern money), and the inventory of his possessions extended over seventeen feet of vellum. The catering equipment included three spits, well over a hundred drinking glasses and ninety china plates; his silver collection comprised not only cutlery, candlesnuffers and his sword, but also the special luxury of two silver chamber pots.

Newton lived in London during a period of rampant consumerism and economic growth. His office at the Mint was based in the Tower, from where he could see boats on the Thames importing African gold for British coins



as well as Asian goods for the expanding luxury market. The essayist Joseph Addison rejoiced that London had become ‘an emporium for the whole Earth...the single dress of a woman of quality is often a product of a hundred climates...the scarf is sent from the torrid zone...the brocade petticoat rises out of the mines of Peru and the diamond necklace out of the bowels of Indostan.’

Such cosmopolitan extravagance was made visible in many pictures, including a conversation piece by William Hogarth: *The Indian Emperor. Or the Conquest of Mexico. As performed in the year 1731 in Mr Conduitt’s, Master of the Mint, before the Duke of Cumberland &c. Act 4, Scene 4* (reproduced above). Gazing down from the mantelpiece, a bust of Newton looms over an aristocratic audience watching their children perform a play about Spanish exploitation in the Americas. Newton had died four years earlier, but this painting forms the structure of my lecture: packed with Newtonian imagery, it depicts the privileged life in which he participated.

The Room

The picture’s elegant London home belonged to John Conduitt, who succeeded Newton as Master of the Mint and had married Catherine Barton, Newton’s niece. His only other surviving likeness is on a commemorative medal struck in 1737, which features Conduitt as a well-fed Roman emperor. On the reverse, he is being ceremonially presented to two residents of the Elysian Fields – Isaac Newton and John Hampden, the Civil War hero who symbolised the rights of parliament. Newton is being commemorated for his affiliation to the Whig party and the Glorious Revolution of 1688: politics and patronage were crucial to his career.

Conduitt greatly admired Newton and strongly influenced how he has been remembered. He already owned the bust on the mantelpiece, while the plaque below was copied from Newton’s monument in Westminster Abbey, which had been commissioned by Conduitt. Placed at the head of the nave, it celebrated Newton’s Whig affiliation at a time when the country’s oldest religious centre was being converted into a national shrine for Enlightenment genius. Previously, the Abbey had been reserved for monarchs and saints, whose Gothic stone tombs lay behind the altar. Newton was one of the earliest members of a new pantheon of intellectual and military men whose classical marble monuments collectively endorsed the maxims of the Whig party – constitutional monarchy, anti-Catholicism, individual freedom.

During the last decade of his life, when Conduitt knew him intimately, Newton devoted himself less to science than to historical and biblical studies that have since been largely forgotten. His marble elbow rests on four books – not only the familiar *Gravity* and *Optics*, but also *Theology* and *Chronology*, which represent two posthumous publications organised by Conduitt. For Newton and many other scholars, correcting the timelines of ancient history and interpreting the Bible formed key components of intellectual endeavour. Edward Gibbon, famous chronicler of the Roman Empire, declared that ‘The name of Newton raises the image of a profound Genius, luminous and original. His *System of Chronology* would alone be sufficient to assure him immortality.’ On Newton’s 83rd birthday, a visitor interrupted him revising once again his model of King Solomon’s Temple, which he regarded as the physical manifestation on earth of a divine abode: ‘Temples were,’ Newton wrote, ‘anciently contrived to represent the frame of the Universe as the true Temple of the great God.’

In Hogarth’s painting, Barton is hanging beneath her husband as if an inferior possession. When she arrived in London, she was probably about seventeen, and seems to have acted as Newton’s housekeeper while he supported her financially. She and Conduitt were both by Newton’s bedside when he died, but only one letter between them survives: when she stayed in the countryside to recuperate from a bout of small pox, Newton wrote solicitously, ‘Pray let me know by your next how your f[ace is] & if your fevour be going. Perhaps warm milk from ye Cow may [help] to abate it. I am Your very loving Unkle, Is. Newton.’

It became common knowledge that Barton was having an affair with Charles Montagu, the Earl of Halifax, who was Chancellor of the Exchequer and played a key role in founding the Bank of England. Since he was Newton’s major patron, scurrilous rumours circulated, although it is now impossible to know in detail about this three-cornered relationship. What is certain is that before leaving Cambridge, Newton had been seeking a new position for some time, and in March 1696 Halifax wrote jubilantly to announce that ‘the King has promised Me to make Mr. Newton Warden of the Mint, the office is the most proper for you ’tis the Chief Officer in the Mint, ’tis worth



five or six hundred p An. ...Let me see you as soon as you come to Town, that I may carry you to kiss the King's hand.' Ten years later, Halifax changed his will by bequeathing £3000 and all his jewels to Barton – and six years after that, he substantially increased the legacy in recognition of 'the great Esteem he had for her Wit and most exquisite Understanding.'

Halifax also ensured that Newton was knighted by Queen Anne in 1705. This was manifestly a political event: Newton earned his accolade not because he was a famous mathematician, but as a reward for being persuaded to stand as a Whig candidate in a parliamentary election. He had already served twice as MP for Cambridge University, but this time was unsuccessful. This supposedly other-worldly man was so gratified by his knighthood that he immediately began researching into his family history and procuring a suitable coat-of-arms.

The Audience

The lecture focuses on two particular spectators in Hogarth's painting: the young prince in a red jacket standing to the left beneath Newton's bust, and the prompter towards the left of the stage with his back turned to everyone.

Prince William – the younger son of George II and Queen Caroline – was very interested in science and owned a small laboratory as well as a printing press in the palace basement. Newton arranged that his friend Edmond Halley, now most famous for the comet named after him, should be his tutor, and William had insisted on going to Newton's funeral in 1727, even though he was only six.

Among the royal family, Newton had most interaction with Prince William's mother, Caroline of Ansbach, who had come over with the Hanoverian Court of George I in 1715. More intelligent and well-educated than her husband, she immediately began implementing continental customs of intellectual patronage and support for the arts and was very eager to recruit Newton for her court. Aware that the Hanoverian monarchy was unpopular, she successfully embedded herself within the nation's affections. By advertising herself as an ideal mother, she eliminated earlier fears about the lack of a successor, and she strategically cultivated leading figures such as Newton. Newton encouraged her royal patronage, which helped him to promote the interests of the Royal Society and also lent him status among his colleagues.

On display in the Science Museum's *Science City* exhibition is an exceptionally large orrery, a Newtonian demonstration instrument that Caroline bought for her Gallery in Kensington Palace. She also engaged with Newton in debates on theological topics that had first captured her interest in Hanover, where she was close to the Elector's Librarian, the philosopher Gottfried Leibniz. Newton and Leibniz are renowned for their vicious priority contest over the invention of calculus, but they also quarrelled about the role of God. Whereas Newton maintained that God was constantly present throughout the universe and could intervene in its operation, Leibniz favoured an absent Divine Clockmaker who had no need to interfere in the world that He had created.

Providing an excellent example of the important roles played by concealed women, Caroline enlisted one of Britain's leading theologians, Dr Samuel Clarke, who soon became a regular visitor to her court. Corresponding with Leibniz while talking to Newton and Clarke, she acted as an intermediary between the three men, but also herself contributed to the debate. Some of the Leibniz-Clarke correspondence was published, and Newton's followers deployed it as effective propaganda for boosting his reputation. Many people assumed that Newton was the sole author of Clarke's replies, whereas this was a joint production in which Caroline had played a crucial role.

Another influential go-between in Hogarth's audience is the prompter dressed in black, John Theophilus Desaguliers, a Huguenot refugee who was Newton's experimental assistant at the Royal Society and also worked for Princess Caroline. Although not particularly famous now, Desaguliers was crucially important for the international dissemination of Newtonian science and for several major engineering projects, including Westminster Bridge. Desaguliers was paid by the Royal Society for his weekly demonstrations, and he also converted his home into a Newtonian school that attracted students from all over Europe. By building working models of engines, he proved that Newtonian ideas could be financially beneficial as well as theoretically enlightening.



Money was a perpetual problem for Desaguliers. His first successful bid for royal patronage entailed lecturing at Hampton Court, where he entertained the family with spectacular experiments designed to impress as much as to educate. These presentations were evidently appreciated, because he persuaded Caroline and her husband to join George I in subscribing to his influential book on Newtonian physics. Resistance to Newtonian gravitation and optics persisted for decades after the *Principia* was published in 1687, especially in France. A frequent visitor to Paris, Desaguliers was far more effective in spreading the new English ideas than Newton himself.

Science City describes how scientific activities were not restricted to universities or laboratories but distributed throughout a variety of London locations. As a leading Freemason, Desaguliers undertook working trips that combined business for the Royal Society, meetings with Masons, and his own private pursuit of money through engineering and educational projects. Hogarth was a Freemason, as were several of the distinguished men in this conversation piece, and at one time around a quarter of the Fellows of the Royal Society (but not Newton). Although that does not necessarily indicate any strong ideological alignment between the two groups, many relevant conversations must have taken place in masonic lodges.

The Stage

The small actors are performing a play from the mid-seventeenth century, John Dryden's *The Indian Emperour*, whose convoluted plot features love, honour and the Spanish conquest of the Aztec empire. Although a revival, the play still seemed relevant because several of the crucial speeches concern Liberty, a key buzz word for the Whig party that Newton supported. English audiences favoured *The Indian Emperour* because Dryden portrayed the Spanish conquerors as cruel and corrupt: Londoners could come away confident of their own moral superiority.

In the very first scene, the Spaniards marvel at the natural riches of South America:

‘Methinks, we walk in dreams on fairy Land,
Where golden Ore lies mixt with common sand...’

Only a decade earlier, British speculators had poured money into the South Sea Company, which predicted great dividends from exploiting the southern Americas. Newton was just one of many investors who lost a small fortune during the unexpected rise and sudden collapse in share price known as the South Sea Bubble. Initially, he made a substantial profit by buying and selling at appropriate times along the steep upward curve. But then he made what is now seen as the classic mistake of buying in again at a higher price and then waiting too long before selling: in today's money, he lost in the region of £3 million.

British attention focused strongly on western Africa, which similarly promised ‘golden Ore’ to be retrieved from ‘common sand’. Contemporary European maps showed the region divided not according to the local peoples, but to the type of natural product that could be plundered and exported: three adjacent areas were named the Grain Coast, the Gold Coast and the Slave Coast. In the second half of the seventeenth century, a new English coin was produced, which became called a guinea after the large area in Africa that furnished the gold. This region formed one apex of the lucrative triangular trade, in which gold and slaves, tobacco and sugar, cotton and guns, circulated round the globe in a system that endured so long because it supported the western economy.

There is no evidence that Newton was personally involved in slave trading, but he did benefit indirectly through his investments, and was also concerned with Gold Coast matters through his position at the Mint. Being Master of the Mint was rather like being the Governor of the Bank of England today. His predecessor had treated the position as a sinecure, but Newton took day-to-day operations extremely seriously, and was fully involved in many different aspects of the British economy; he was also in charge of several subsidiary Mints spread throughout the country. The London Mint was based in the Tower, where its dilapidated buildings were spread along a small lane running between the inner and outer fortifications. Newton found life there very difficult: he frequently competed for space with the Ordnance Office and was disturbed by the constant noise of the Mint's machinery and drilling soldiers.



A meticulous manager, Newton greatly boosted productivity at the Mint, but made himself unpopular by carrying out time and motion studies to improve efficiency. Forced to work for long hours at top speed, coiners were operating as human machines in a hot, dangerous environment. Newton was paid a fee for every coin that was minted, an important source of his wealth. His first main responsibility was to implement the Great Recoinage of 1696, although he had argued against its introduction. The economy was under threat because criminals clipped off the edges of silver coins, thus reducing their precious metal content and making them worth substantially less than their face value. The plan was to recall all the old coins, melt them down and then produce new tamper-proof ones with milled edges. However, the scheme was only partially successful, mainly because the timetable for completion was too short: many people were so suspicious that they failed to hand in their old currency and at the end of the process were left with coins of relatively little value.

Newton proved ruthless in his attempts to stamp out crime and improve efficiency. He set up a network of informers and paid his officers to wear disguises for penetrating criminal rings. Remorselessly pursuing forgers, he ensured that many of them were imprisoned and several of them hanged. Unsurprisingly, he created many enemies, including a Newgate prisoner who expressed this threat: ‘a Rogue and if ever King James came again he would shoot him and the s^d Ball made answer God dam my blood so will I and tho I don’t know him yet Ile find him out.’

Every year, independent tests were carried out publicly during a traditional ceremony called the ‘Trial of the Pyx’. A sample of coins produced at the Mint was stored for assessment in special Pyx Chests, which were transported by boat from the Tower to Palace Yard at Westminster, where a fifteen-man jury compared some randomly picked coins against a trial plate to ensure that, on average, they contained a sufficiently high amount of gold to meet the agreed standard. Newton’s experimental expertise sometimes came in useful. In 1707, the goldsmiths claimed that the Mint’s coins failed to match the assay plate, and a violent argument broke out. After carrying out his own tests, Newton arrogantly told them the source of their error: ‘If this aqua fortis be poured off & fresh aqua fortis be poured on... And a third water will leave it still finer, & a fourth still finer. But Assaymasters & Refiners proceed no further than to two waters.’ However, recent analyses have shown that Newton was probably in the wrong.

As well as profiting personally from his investments in global trading companies, Newton also benefitted scientifically. When he was revising his *Principia* for the second edition, he needed to collect observations of tides from around the world, and the best people for providing those measurements were officials and merchants based in foreign ports. He collated information from about 30 locations scattered around the globe along trade routes converging on Britain from China and India, from West Africa and the West Indies. The final version of what is now revered as the world’s greatest book on physics incorporated information that had been gleaned from British colonizers who were both exploring and exploiting the globe.

Conclusion

This lecture has presented some unfamiliar aspects of Isaac Newton, and he would probably have preferred to be remembered rather differently. During the last few years of his life, he started telling friends about having been inspired by the fall of an apple, the mythological story that may or may not be based on an actual incident. He also commissioned some late portraits, choosing one of them for the engraved frontispiece in the third and most widespread edition of the *Principia*.

Like any picture, this was not necessarily a faithful representation. A visiting American reported in a letter back home that ‘by all those who have seen him of late, as I did, bending so much under the Load of Years as that with some difficulty he mounted the Stairs of the [Royal] Society’s room. That Youthful Representation will I fear be considered rather as an object of Ridicule than Respect, & much sooner raise Pity than Esteem.’

By painting a verbal portrait, this lecture has offered yet another view of Isaac Newton, but there can never be a single definitive version of this man who died almost three hundred years ago.



Further Reading

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The Indian Emperor - William Hogarth (1731-2) -

https://commons.wikimedia.org/wiki/File:William_Hogarth_theater.jpg

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