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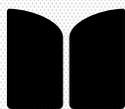
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# Contents

Looking for “the Longitude”, Katy Barrett

# Looking for “the Longitude”

Katy Barrett

## **Authors**

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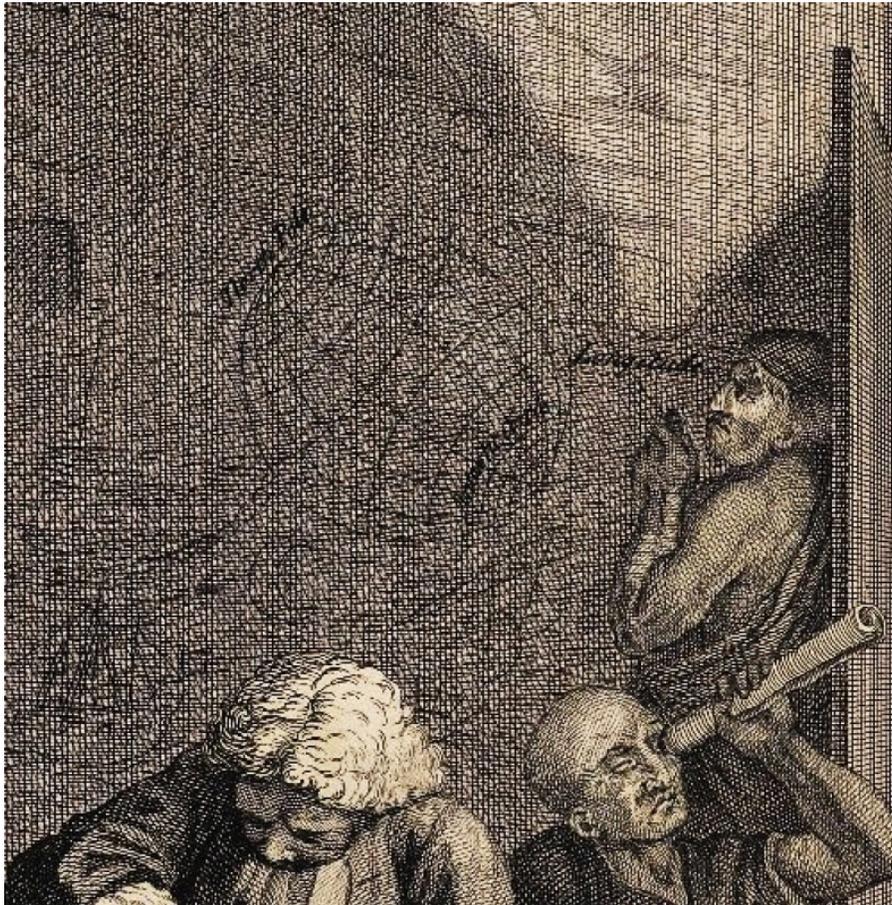
Katy Barrett, "Looking for “the Longitude”", *British Art Studies*, Issue 2,  
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**The “Look First” feature is pre-eminently visual, encouraging viewers to engage with art objects in new ways through BAS’s digital platform.**

**"Looking for the Longitude" will be published as a sequence over 12 days to coincide with the anniversary of the Hogarth Act, culminating on 25 June. Looking for “the Longitude” takes us on an interactive exploration of the ‘Longitude Problem’, drawing in contributions from experts in the field as it grows. Locating a detail from the final plate of Hogarth’s *A Rake’s Progress* as its starting point, the article will unfold over subsequent weeks to include a range of connected images and objects, including a Twitter tour of associated places and sites.**

Introduction by

**Katy Barrett**, Curator of Art pre-1800, Royal Museums Greenwich



**Figure 1.**

after William Hogarth, *The Rake's Progress*, 'The Madhouse' (detail), engraving

This “Look First” feature begins with one small detail from a print made in 1735: the depiction of an inmate of Bedlam, found in the final plate of William Hogarth’s famous satirical series *A Rake’s Progress*. In the shadows at the back of the notorious madhouse, a man looks intently at a drawing on the wall—a drawing that alludes to a particular scientific question. What he is considering is how to find a means of accurately measuring longitude at sea: a problem of central importance for Hogarth’s contemporaries, but one that has rarely troubled historians of his work. <sup>1</sup>

From this detail, we will pan out to twelve associated images, in order to look at how the “longitude problem”, as both an intellectual and a scientific endeavour, came to be embedded within Georgian visual culture and the law concerning copyright. Here, “Look First” looks over the shoulder of Hogarth’s

figure, and uses this particular detail from the artist's work to think anew about the act of detailed looking itself, and about how we might learn to see an image within its social and historical context. For this inmate's concern was not only that of how to solve the "longitude problem", but also of how to communicate the details of his solution such that others might see it as he did.

The "so much wanted and desired" measurement of longitude at sea had been of increasing interest to sailors and natural philosophers throughout the seventeenth century.<sup>2</sup> While latitude could be established relatively easily from the height of the sun, longitude required extremely accurate technology, together with complicated observations and calculations of the moon and stars. Yet, these two lines—latitude and longitude—were needed to fix your point on the Earth, and more particularly to establish one's location on a featureless sea. It was in the eighteenth century that the problem of establishing longitude became particularly acute, as both British trade and naval power expanded. In 1714 the British government passed an Act to encourage proposals to find longitude accurately at sea.<sup>3</sup> At the time, a number of potential solutions to the problem were thought to be "true in the Theory, but difficult to execute", as Sir Isaac Newton reported to Parliament.<sup>4</sup> The "Longitude Act" therefore sought to encourage new proposals, and established a board of commissioners to judge these, rewarding graded amounts of money proportionate to a submission's success.

The ten, fifteen, or twenty thousand pounds on offer was a remarkable amount of money. It was equivalent to the top prizes in the popular lotteries of the period. Winning would make someone's fortune. "The longitude", as it simply became known, instantly attracted hundreds of proposals from genuine, deluded, and disingenuous inventors alike. Poor John Flamsteed, the first Astronomer Royal and therefore an *ex officio* Commissioner of Longitude, complained of the "Swarme of hopefull Authors" who tried to contact him.<sup>5</sup> Both manuscript and published proposals were sent to the Commissioners and advertised to the public in broadsheets and newspapers alongside offers of public demonstrations. Longitude became part of the burgeoning public culture of science, discussed and demonstrated in coffeehouses, inns, and drawing rooms.

Simultaneously, the project to discover longitude became emblematic of the spectre of "projecting" that threatened entrepreneurial society. Though it is particularly associated with the notorious financial project of 1720-21 known as the South Sea Bubble, "projecting" was an idea applied to every walk of life, from politics and religion to natural philosophy. A "project" was a naive, foolish, or even malicious scheme that preyed on public gullibility and that generated financial investments that never brought a return. With its

encouragement of proposals that sought financial backing, longitude became the ultimate example of such a project. It was compared by satirical and serious commentators alike to everything from the Hanoverian succession to the philosopher's stone. "Projectors", as one satirical poet observed,

thus lay mighty Schemes,  
And Chymists live in golden Dreams;  
Beggar'd by Hope, in Folly old;  
They starve 'midst fancy'd Pow'r and Gold. <sup>6</sup>

The public attitudes that Hogarth makes visible on the wall of Bedlam are twofold and cyclical: not only that only the mad would seek to solve longitude, but also that the attempt to find a solution would eventually drive any sane person mad. Over twenty years after the passing of the Longitude Act, Hogarth encapsulates "the longitude" that circulated and "bubbled" in print, from scientific pamphlets to engraved images, from poems to religious tracts, and from plays to bawdy jokes. The "great variety of papers and pamphlets" of which Flamsteed complained had, by 1735, made longitude into much more than a niche problem within the science of navigation. <sup>7</sup> It had become a cultural symbol of social concerns around the instability of knowledge and the dangers of speculation in society, and a symbol that any viewer would recognize. Appearing around the time that the Commissioners of Longitude eventually deemed it necessary to meet for the first time, Hogarth's image encapsulated the wider public discourse that framed the Commissioners' dealings with their most famous applicant, the clockmaker John Harrison. <sup>8</sup>

A shadowy group of Hogarth's fellow engravers followed his lead in making this discourse visible. For it was this clutch of hack artists who recognized, picked up, and adapted his longitude reference when they were sent by rival printsellers to view and memorize his *Rake's Progress* paintings surreptitiously at his studio in Leicester Square. Their job was to produce cheap versions of the *Progress* for hack publishers before Hogarth's own, original version became protected by a new copyright act, known colloquially as "Hogarth's Act". <sup>9</sup> These men operated within the graphic culture which generated the myriad visual and textual representations to which Hogarth responded. Their pirate versions show us how these engravers read, understood, and remembered Hogarth's original picture, complete with its longitude "lunatic". They clearly comprehended his reference within the wider symbolism of the longitude debate, but also added, perhaps inadvertently, signs that compounded or expanded Hogarth's original. By looking at the original and hack engravings side by side, combined with the print and manuscript materials that had been circulating in London, we can

see how an engraver producing Hogarth's painting from memory might build up a subtly different version of the original out of a shared network of references. We can develop a "period eye" nuanced by the social, scientific, and cultural world of eighteenth-century London. We can begin, perhaps, to see how others saw Hogarth's image.

The "Hogarth Act" passed into law on 25 June 1734. It was in this precious window between the reading of the Act in Parliament on 4 March and its enactment nearly four months later that pirate engravers had their chance to memorize and interpret Hogarth's detailed scenes. This "Look First" is published to coincide with this period of frantic activity on the part of those long-forgotten pirate engravers. From a first look at Hogarth's painting, the extra images that we will publish will build up day by day, allowing the final pirate version to appear, in the nick of time, on 25 June this year.

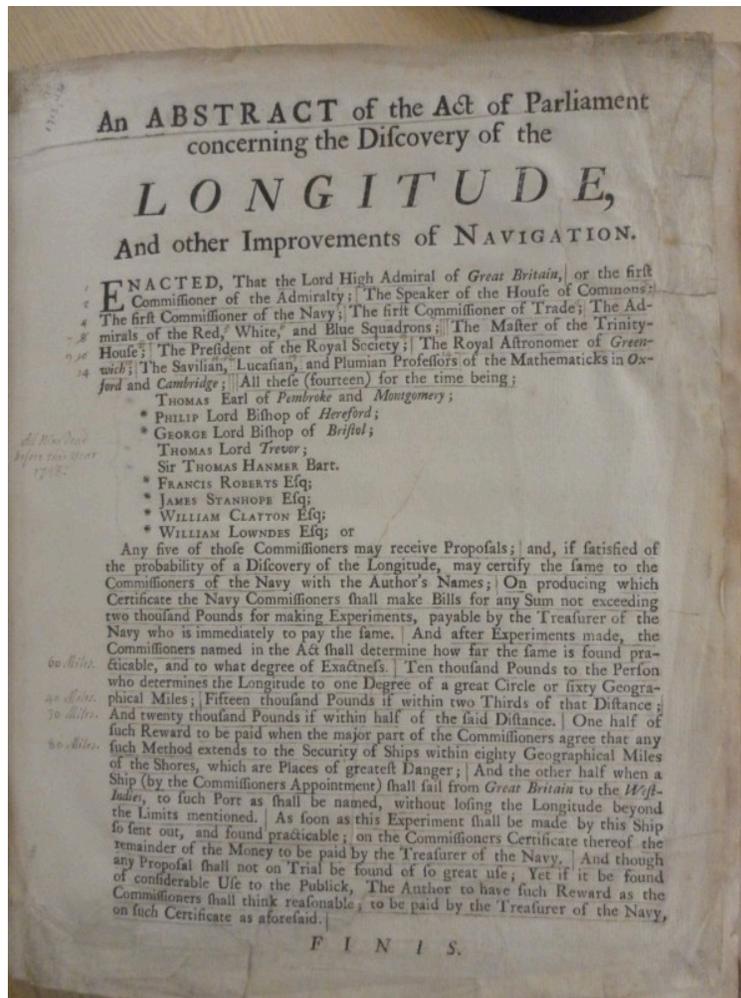
It also seems fitting that these images are appearing digitally, in the context of *British Art Studies's* commitment to the judicious use of Fair Dealing Law as it applies to the reproduction of images, and as online access to collections and databases makes the graphic milieu of Hogarth's work all the more accessible. The images and texts that might have informed Hogarth's copyists were tied to specific urban locations. It was not just what you saw or read but where you saw and read it that mattered. An associated map and Twitter tour will therefore further elucidate the metropolitan landscape which, nearly three hundred years ago, shaped the visual and cultural understanding of those rogue artists.



**Figure 2.**

William Hogarth, The Rake's Progress, 'The Madhouse', 1733-34, oil on canvas , 62.2 x 74.9 cm Digital image courtesy of Sir John Soane's Museum





**Figure 4.** Unknown, An Abstract of the Act of Parliament concerning the Discovery of the Longitude, *and other improvements in Navigation*, 1714, engraving, 23.8 × 18 cm Digital image courtesy of Bodleian Library, University of Oxford

11 June 1714 — 13<sup>th</sup> of L. Anne

Sir Isaac Newton attending the Committee, said  
 that for determining the Longitude at Sea, there have  
 been several projects, true in the Theory, but difficult  
 to execute.

One is by a Watch, to keep time exactly, but  
 by reason of the motion of a Ship, the variation of  
 heat & cold, wet and dry, and the difference of gravity  
 in different Latitudes, such a Watch hath not yet  
 been made.

Another is by the Eclipses of Jupiter's  
 Satellites: but <sup>by reason of the length of the scopes</sup>  
 requires to observe them, and the motion of a Ship  
 at sea, these Eclipses cannot yet be there observed.

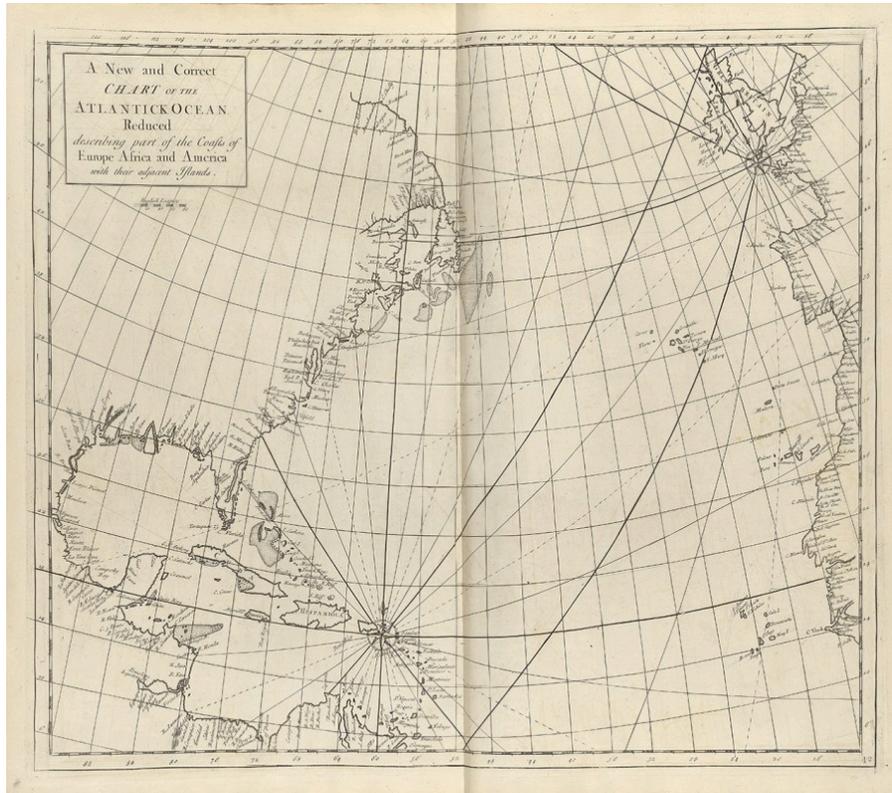
A third is by the place of the Moon;  
 but her Theory is not yet exact enough for this  
 purpose: it is exact enough to determine her  
 Longitude, within two or three degrees, but not  
 within a degree.

16<sup>th</sup> January 1714/2

If Clocks or Watches could be made to keep time  
 exactly on Ship board, 'tis allowed on by all hands,  
 they would be the best means for determining the  
 Longitude at Sea.

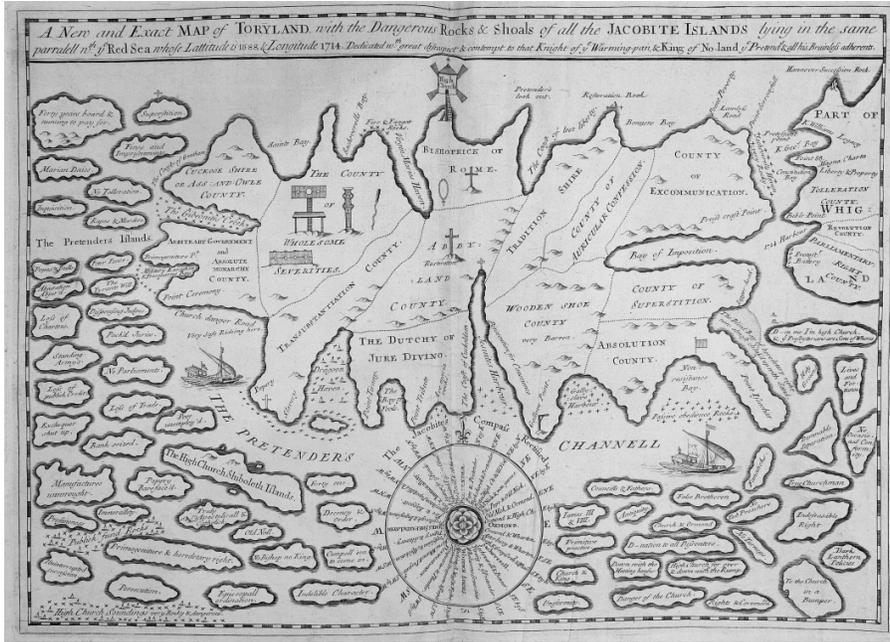
M. Fother, P.R.S. Robert Smith, M.A. & P. Comd. James Bradley, M.A. & P. Comd. J. Gordon, P. Comd. George Spateman Edmund Halley, M.A. & P. Comd.	Wm. Jones Marcibignoli James Swinn Chas. Savinich A. De Moivre John Hadley.
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**Figure 5.**  
 William Wildman Barrington, Sir Isaac Newton's  
 Opinion given in 1714, Manuscript copy collated by  
 William Wildman Barrington, 1764, pen and ink, 32.0  
 x 20.3 cm Digital image courtesy of National  
 Maritime Museum, Royal Museums Greenwich

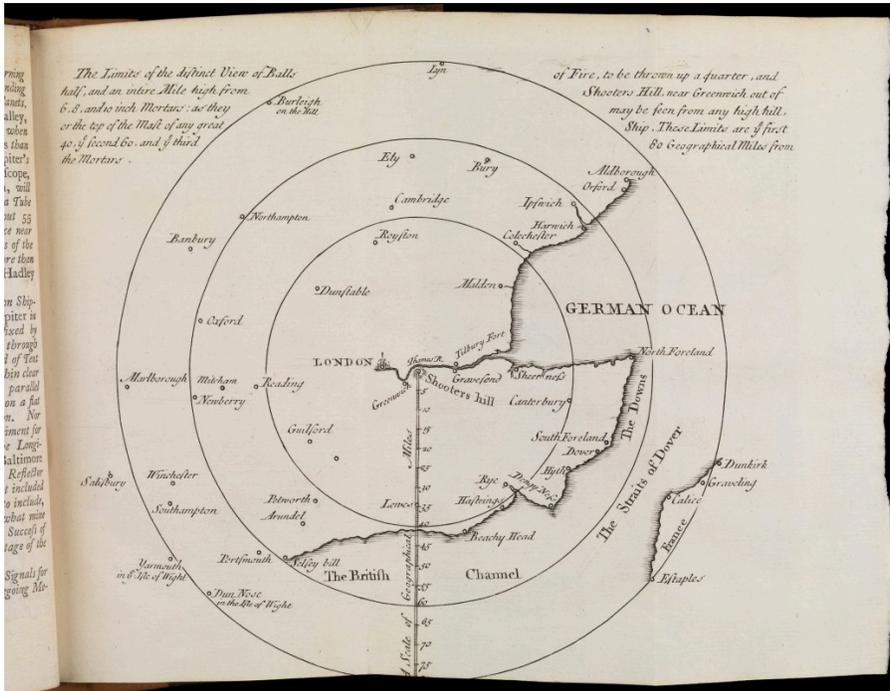


**Figure 6.**

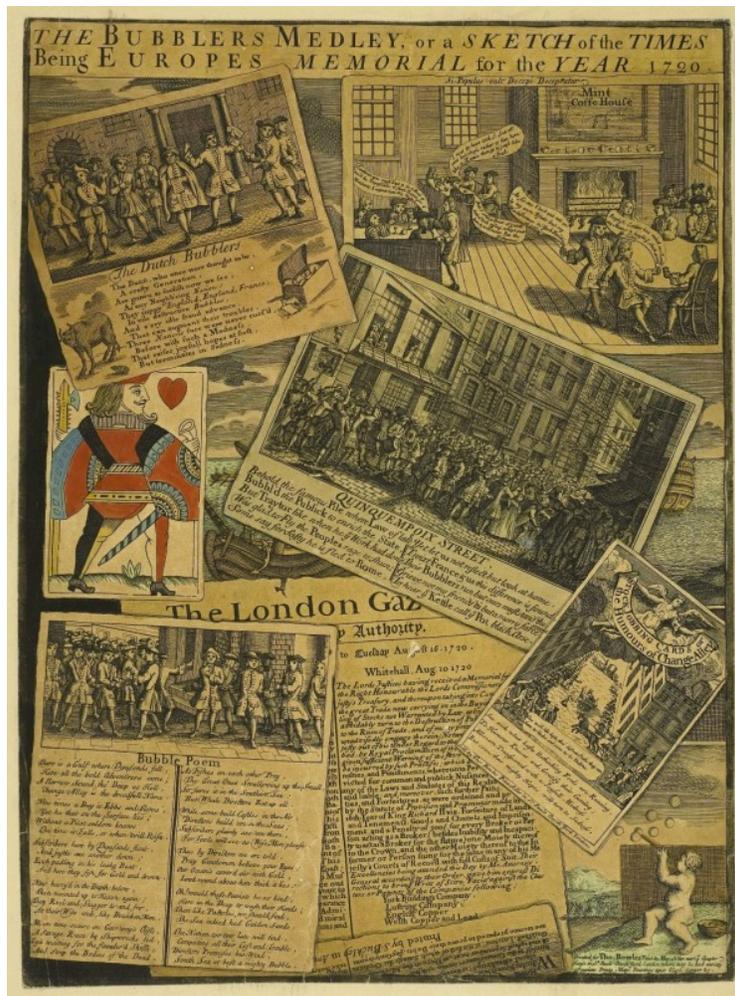
Unknown, 'A New and Correct Chart of the Atlantick Ocean, *reduced* describing part of the Coasts of Africa and America with their adjacent islands' from *Atlas Maritimus et Commercialis*, 1724, engraving, 51 x 59 cm Digital image courtesy of National Maritime Museum, Royal Museums Greenwich



**Figure 7.** Unknown, A New and Exact Map of Toryland, with the dangerous Rocks and Shoals of all the Jacobite Islands lying in the same Parallel nth ye Red Sea whose Latitude is 1688, and Longitude 1714, 1729, engraving, 56.5 x 57.6 cm Digital image courtesy of Bodleian Library, University of Oxford



**Figure 8.** Unknown, Plate from William Whiston, The longitude discovered, 1738, engraving, 19.4 x 25.5 cm Digital image courtesy of National Maritime Museum, Royal Museums Greenwich

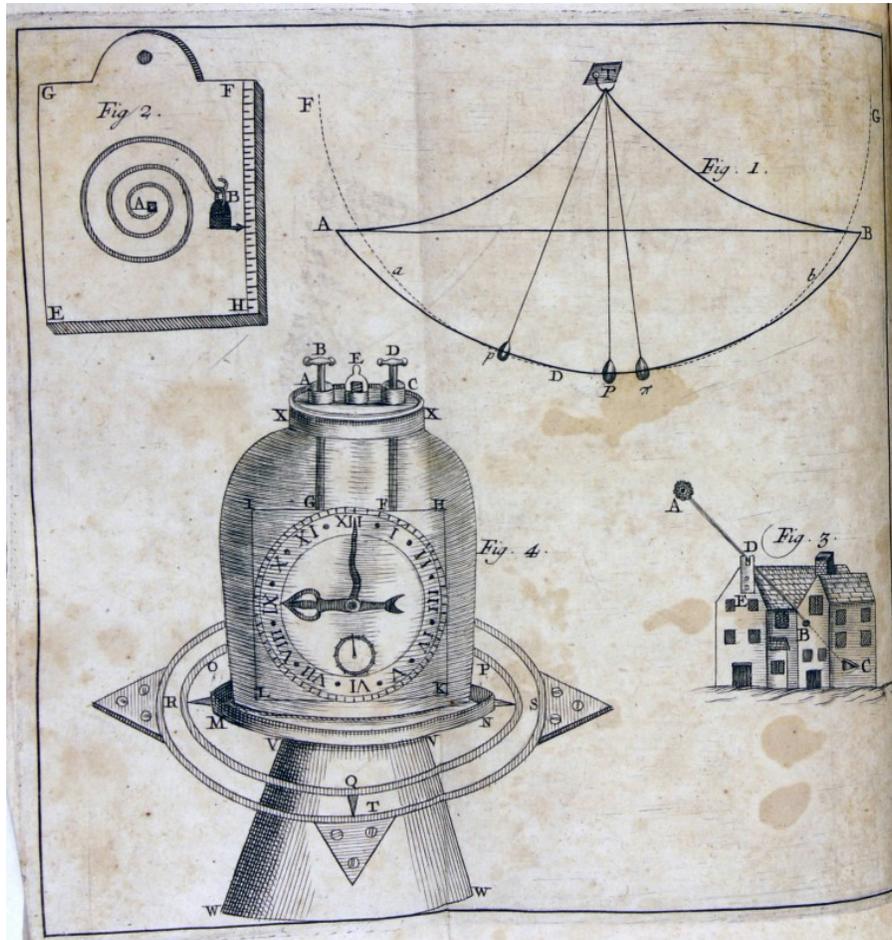


**Figure 9.** Unknown, The Bubbles Medley, 1721, hand coloured engraving, 34.2 x 25.1 cm Digital image courtesy of Trustees of the British Museum.



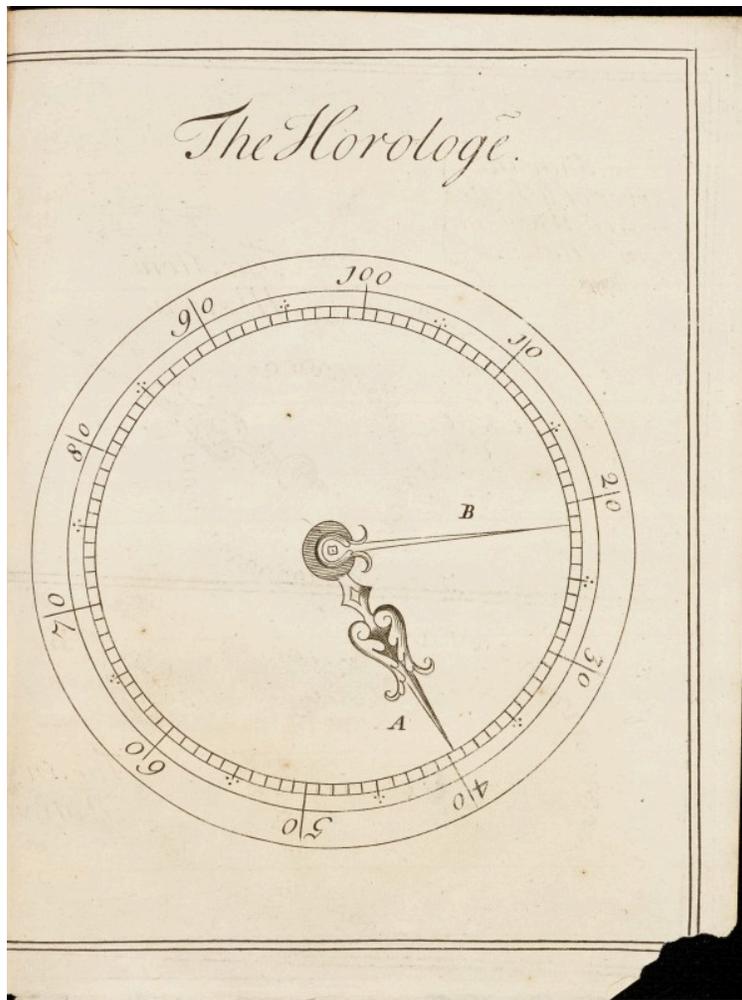
**Figure 10.**

Unknown, Frontispiece to William Hunt, *The projectors. A comedy. As it was intended to be acted at one of the theatres, 1737*, engraving, 19.3 × 11.8 cm Digital image courtesy of National Maritime Museum, Royal Museums Greenwich



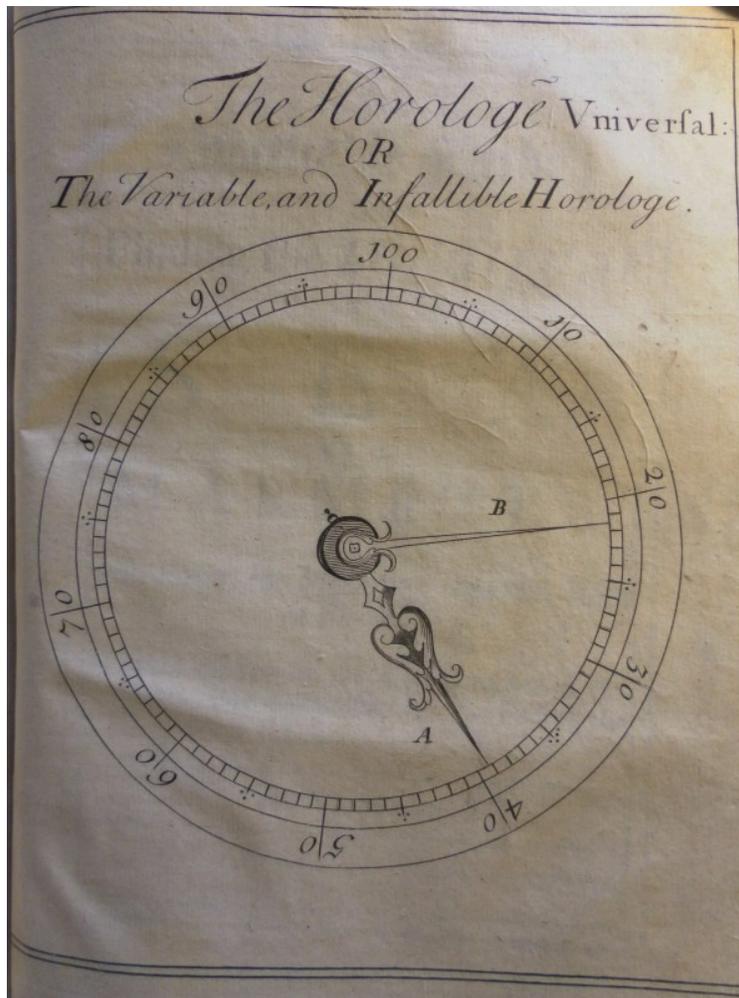
**Figure 11.**

Unknown, Plate from Jeremy Thacker, *The longitudes examin'd*, 1714, engraving, 19.3 x 16.4 cm Digital image courtesy of St John's College, University of Cambridge



**Figure 12.**

Unknown, Plate II 'The Horologe', from William Hobbs, *A new discovery for finding the longitude*, 1714, engraving, 21.5 x 16.1 cm Digital image courtesy of Cambridge University Library



**Figure 13.**

Unknown, Plate II 'The Horologe Universal', from William Hobbs, *A new discovery for finding the longitude*, 1716, engraving, 21.0 × 15.8 cm Digital image courtesy of Magdalen College, University of Oxford



**Figure 14.** Unknown, after William Hogarth, He is chained raving mad in Bedlam, 1735, engraving, 27 x 32.9 cm Digital image courtesy of Trustees of the British Museum.

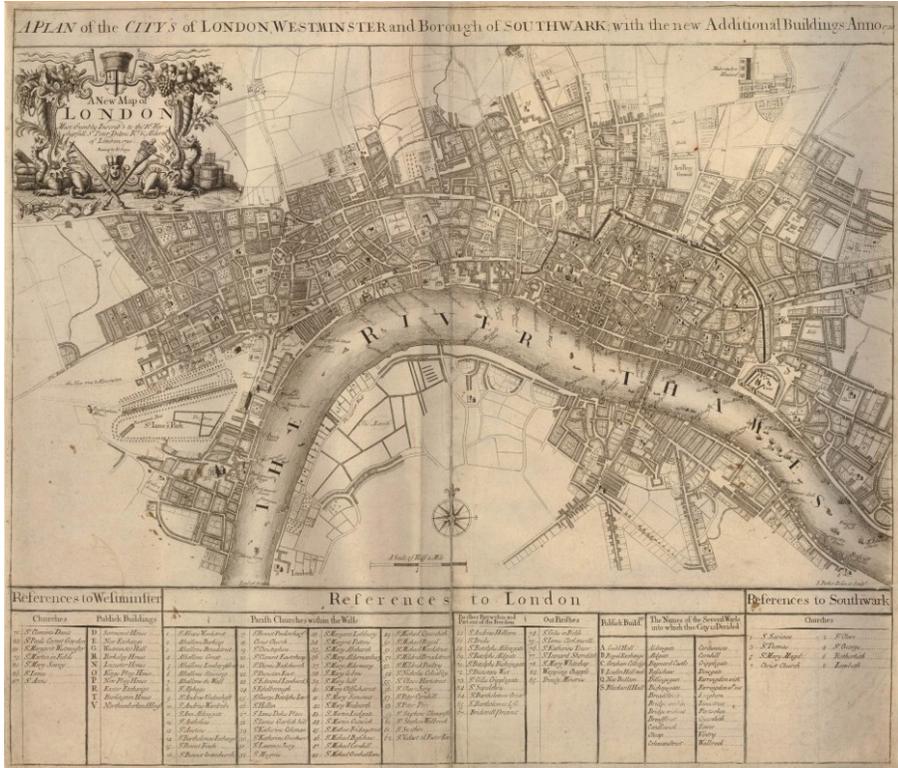
Response by

**Katy Barrett**, Curator of Art pre-1800, Royal Museums Greenwich

### **Day 1: Response to figures 2 and 3**

Hogarth's "modern moral" print series brim with references to specific London locations. He uses these urban spaces, rich in meaning to a contemporary audience, to place his protagonists not only spatially, but also socially, morally, economically, and politically, in terms of the cultural geography of the city. These were geographies that informed how Londoners lived their lives, and how they understood the print and manuscript materials that circulated in the city. They were crucial to how different protagonists engaged with the "longitude problem", whether as commissioners, natural philosophers, instrument makers, publishers, mapmakers, artists, satirists, or the frequenters of coffee houses

Over the next ten days, a group of experts will consider the significance of different locations in eighteenth-century London. Each is connected to a different image in the longitude story and each contributes to build a picture of how Hogarth's hack copyists would have understood his image. Follow our experts in a trail across London through a Twitter tour and interactive map.



**Figure 15.** S. Parker, *A Plan of the City's of London, Westminster and Borough of Southwark with the new additional buildings Anno 1720*, 1720, etching, 50.6 x 58.8 cm Digital image courtesy of Trustees of the British Museum



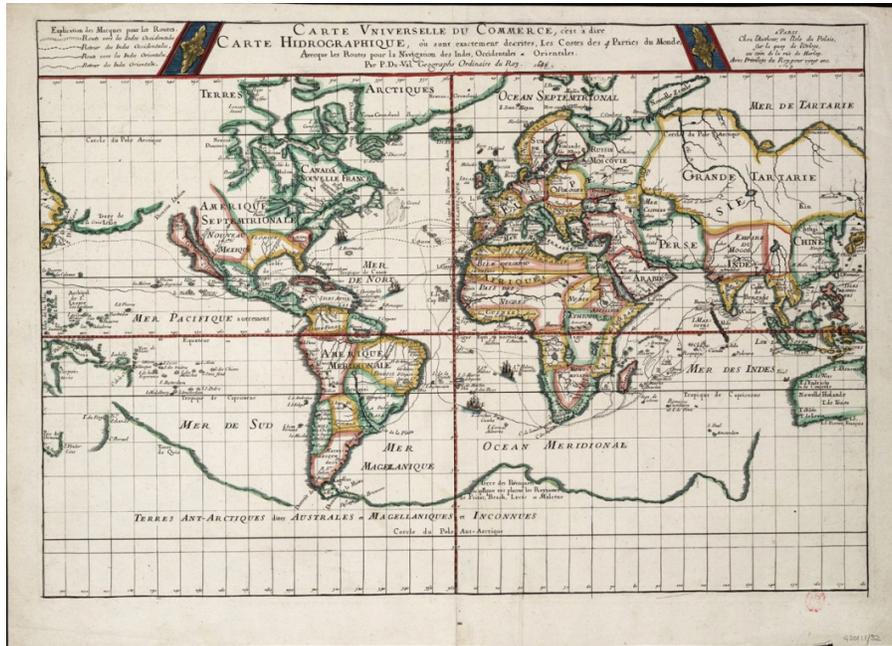
Response by

**Richard Dunn**, Senior Curator for the History of Science at Royal Museums Greenwich

## **Day 2: Response to figure 4**

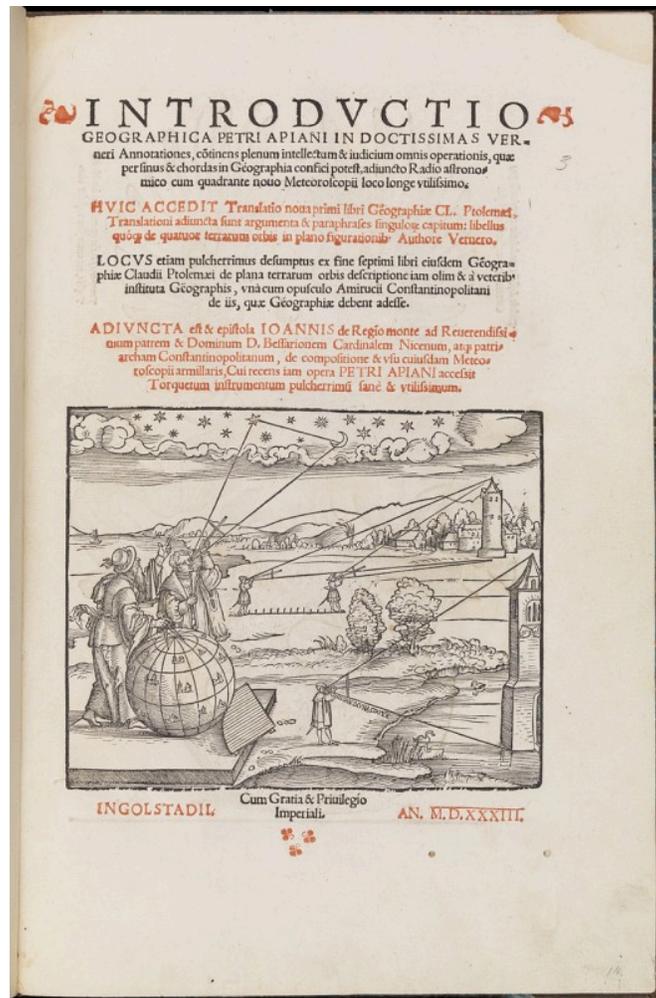
Queen Anne came to the House of Lords for the last time on 9 July 1714. On that day she gave her royal assent to twenty-nine Acts of Parliament, including at number six, “An Act for providing a Public Reward for such Person or Persons as shall discover the Longitude at Sea”. Though promulgated in Westminster, the Act had a wider geographical history and its supporters hoped it would have an impact across the globe.

The Act was meant to tackle a single, long-standing seafaring problem: how to measure a ship’s longitude (east-west position) when out of sight of land, in order to combine it with the more easily measurable latitude (north-south position) to pinpoint one’s position. The challenge, however, was not one of theory—mathematicians and philosophers had long understood the principles and perhaps felt they might soon sort the practicalities too. The German mathematician and printer Peter Apian, for instance, even illustrated one of the known longitude-finding methods on the title page of his *Introductio Geographica* (Ingolstadt, 1533), showing an observer measuring the distance between the moon and a fixed star.



**Figure 16.**

Pierre Du Val, Carte universelle du commerce, 1686, engraving coloured in outline, 42 × 58.5 cm Digital image courtesy of National Maritime Museum, Royal Museums Greenwich



**Figure 17.**  
 Peter Apian, title page *Introductio Geographica*  
 (Ingolstadt, 1533), 30.7 × 20.5 cm Digital image  
 courtesy of National Maritime Museum, Royal  
 Museums Greenwich

But theory ran into trouble at sea: ships made unsteady observing platforms; long voyages took in all sorts of climates; the weather might be hostile. That said, ships were successfully trading across the globe long before 1714: Pierre Du Val's 1686 world-map showing French and Spanish routes makes this abundantly clear. Nevertheless, the desire to find a way to fix longitude at sea endured, 'for the Safety and Quickness of Voyages, the Preservation of ships, and the Lives of Men', as the Act noted. Attempts to encourage workable solutions had a long history too: as different nations came to dominate the high seas, it seems, so thoughts turned to the longitude. Spain offered rewards in 1567 and again in 1598; the Dutch from 1600. England then France joined the party in the eighteenth century. But theory ran into trouble at sea: ships made unsteady observing platforms; long voyages took in all sorts of climates; the weather might be hostile. That said, ships were

successfully trading across the globe long before 1714: Pierre Du Val's 1686 world map showing French and Spanish routes makes this abundantly clear. Nevertheless, the desire to find a way to fix longitude at sea endured, "for the Safety and Quickness of Voyages, the Preservation of ships, and the Lives of Men", as the Act noted. Attempts to encourage workable solutions had a long history too: as different nations came to dominate the high seas, it seems, so thoughts turned to the longitude problem. Spain offered rewards in 1567 and again in 1598; the Dutch from 1600. England, then France, joined the party in the eighteenth century.

Once Britain made its play, hundreds of abstracts of the 1714 Act must have been printed to spread the news beyond Westminster. They set out the essentials of the Act: the Commissioners nominated to judge proposals; the sea-trials by which promising solutions would be assessed; the rewards of up to £20,000. Most of the flyers have disappeared. This copy, annotated by mathematician and inventor Nicolas Fatio de Duillier (a man with hopes of a reward) and pasted into his copy of Newton's *Principia*, is a rare survival of the attempt to spread the word from Parliament to the people.

Response by

**Rebekah Higgitt**, Lecturer in history of science, University of Kent

### **Day 3: Response to figure 5**

The Longitude Act of 1714 appointed Commissioners to decide whether proposed methods of finding longitude should be tried and rewarded. What it did not do was set up a standing body, or “Board” of Longitude, or any kind of procedure for submitting methods and machines. Those who wished to be considered under the terms of the Act were left to address the Commissioners or the Admiralty in published pamphlets, in newspapers, by letter, or in person. The Astronomer Royal, John Flamsteed, was one of the Commissioners, and as early as August 1714 was writing to his former assistant Abraham Sharp about the letters, pamphlets, and “pretenders” reaching him at the Royal Observatory in Greenwich. It “will make you laugh abundantly”, he told Sharp, to hear of the two men who travelled 150 miles (over 80 kilometres) to tell him about their vacuum-based timing device.

In the 1720s Newton continued to be consulted by the Lords of the Admiralty. He reiterated his general advice (he was right that astronomy was the only means by which longitude could be *found* if it had been lost: clocks would only *keep* longitude; [fig. 18](#)) and commented as required on specific proposals. These included Jacob Rowe’s hour glasses, made with tin “sand”, which he considered “a very good piece of art”.

To the R<sup>ts</sup> Hon<sup>ble</sup> the Lords Commissioners  
of his Maj<sup>ties</sup> Admiralty.

May it please your Lordships

The Longitude will scarce be found at sea without pursuing those  
methods by which it may be found at land. And these methods are hitherto only  
two: one by the motion of the Moon the other by that of the innermost Satellite  
of Jupiter. The first method hath been long practis'd by Geographers, & Geography  
hath been settled thereby: but the Motion of the Moon is not yet exact enough for  
the sea. It hath lately been made exact enough for finding the Longitude at sea  
without error above three Degrees, & if it were exact enough for finding it  
without error above one Degree it would be very useful, if without being above 60  
minutes it would be more usefull, & if without error above half a Degree it would  
scarce be improv'd any further, as I told the Committee of Parliament in writing  
when this matter was refer'd to them. And thereupon the Parliament pass'd the  
Act to reward him or them who should find it to 2 Degrees or to 40 Minutes or to half  
a Degree. But nothing hath been done since for making it more exact than it was at  
that time. Dr Halley hath been observing the Moon the three last years, & finds her  
Theory as exact as I affirm'd: but to make it exact enough for sea affairs is a  
work of time. His errors sometimes amount to six minutes. When it shall be made  
a little exacter so as never to err above three or four minutes, it may be time to  
begin to apply it to sea affairs.

The other method of finding the Longitude is by observing the eclipses of the  
innermost Satellite of Jupiter. This is the easiest & exactest method at land, & hath much  
corrected Geography. But Telescopes of a sufficient length for seeing those Eclipses  
are not manageable at sea. And what may be done by short reflecting Telescopes will  
take in much light & magnify but little, hath not yet been try'd.

A good sweet-water kept from the air in a proper case, & examin'd every four  
mornings & four evenings of the rising & setting Sun, & kept in an even heat, may be  
sufficient for knowing the time of an observation at sea till either method can be  
found out. Or else such a clock may be used as the Quaker-hood in going  
from hence to Portugal. Or such a clock as Mr Cass Billingsley propos'd to be  
try'd. But these clocks will be affected by the variation of gravity in varying the  
Latitude: & the quantity of that variation is not yet sufficiently known.

The four glasses of Mr Rowe made with sand of sea are a very good piece of  
art, the sands being globular & small & of an equal size. These glasses in very smooth  
sea sailing by the log may with advantage be used instead of the vulgar lead-glasses  
made with common sand, if these that are well made can be had at a moderate price. For  
the vulgar glasses are not exact enough for this purpose, for they have not yet been  
try'd. ~~They are also well contriv'd, & deserve to be try'd at sea for finding the Latitude. They may be~~

Also the new methods of Mr Rowe for finding the motion of the sea under the  
to the sea water at the depth of some fathoms below the surface of the sea, whether  
at the surface, may add to the improvement of sailing by the log, provided these new  
methods will not be too troublesome to be exactly used by the seamen. But this deserves  
to be further consider'd, for the motions of the sea arising from winds seem to depend  
on the surface, & reach not very far, but those of lasting currents seem to depend  
& so do those arising from the cause of tides. ~~They are also well contriv'd, & deserve to be try'd at sea for finding the Latitude. They may be~~

Mr Rowe's instruments for taking altitudes ~~are also well contriv'd, & deserve to be try'd at sea for finding the Latitude. They may be~~

**Figure 18.**  
Sir Isaac Newton, Draft of a letter to the Lords  
Commissioners of the Admiralty, *about potential  
methods of determining longitude at sea*, circa  
1697-circa 1725, pen and ink on paper Digital image  
courtesy of Cambridge University Library



**Figure 19.**

after Thomas Rowlandson and Augustus Charles Pugin, Board Room of the Admiralty, Plate 3 of *Ackermann's Microcosm of London*, 1808, coloured aquatint, 27.6 × 33 cm Digital image courtesy of National Maritime Museum, Royal Museums Greenwich

Careful lobbying and alliance building were used to gain the attention of Commissioners. Schemes were described or demonstrated at a range of sites, and testimonials could boost their plausibility. The Royal Society, the Admiralty, the workshops of established instrument makers, and London's coffee houses were all places in which longitude projects were discussed and might gain traction. These pathways were well trodden before the Commissioners of Longitude ever found reason to meet as a group and transact business. It required the interest and approval of experimental philosophers and instrument makers before John Harrison's sea timekeeper was first considered for reward in 1737. It was the on-going relationship with Harrison above all that caused the Commissioners to meet regularly over the next few decades, although there were other methods and pieces of work to consider, to commission, and to reward. By the 1760s, when formal trials took place of variations on three of the methods Newton had highlighted in 1714, the Commissioners had begun to refer to themselves as a Board. Meetings at the Admiralty were regular, there was business to attend to, a secretary to keep minutes, and still plenty of correspondence to tackle (fig. 19).

Response by

**Katherine Parker**, PhD Research Fellow, Hakluyt Society

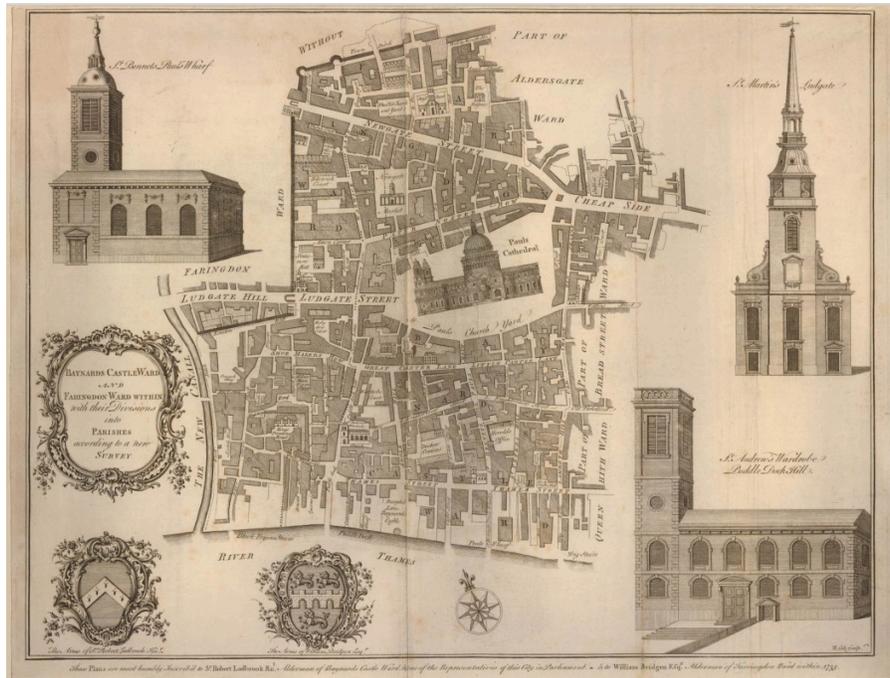
#### **Day 4: Response to figure 6**

In the eighteenth-century, as now, maps could be used for a variety of purposes and appealed to a broad audience. Schoolboys learned to read globes in school, merchants relied on maps to plan trade, sailors used charts to navigate, and women read gender-targeted ladies' geographies—cartography, like the longitude, was part of the literate, polite consumer society of eighteenth-century London. A prominent group interested in maps were the Fellows of the Royal Society, founded in 1660, which met at Crane Court from 1710 to 1780 ([fig. 20](#)). In an attempt to construct a comprehensive understanding of the world, the Royal Society served as a repository for maps, books, and artefacts brought to it from abroad. The Fellows did not, for the most part, make their own maps, however. To buy or commission a map, Fellows would have had to walk down Fleet Street to St Paul's Churchyard, the centre of the print industry in eighteenth-century London ([fig. 21](#)).



**Figure 20.**

Charles John Smith, House occupied by the Royal Society Crane Court Fleet Street, 1837-1840, etching, 17.4 × 11.4 cm Digital image courtesy of Trustees of the British Museum



**Figure 21.**

Benjamin Cole, Baynards Castle Ward and Faringdon Ward within with their Divisions into Parishes, *according to a new Survey*, 1756, engraving, 36.8 × 47.5 cm Digital image courtesy of Trustees of the British Museum

Britain did not have a notable domestic map-making industry until after the Restoration and the Great Fire of 1666, when French Huguenots and Dutch immigrants moved to London, particularly the Soho area, and installed themselves in the print industry. British map-makers tended to be engravers, while their Continental counterparts would create manuscript maps that would be sent to guild artisans for engraving. To make a new map, the geographer would consult sources old and new, develop a sketch map, and then engrave the draft on copper plate. However, since copper plates were expensive, map-makers often recycled or altered old plates to cut down on production costs. The use of old sources and the reuse of plates is how certain geographic features, like the great Southern Continent, were perpetuated, even if some scholars doubted their existence. Geographic chimeras were not so much fanciful creations of the likes of Lemuel Gulliver; rather they were, at least in part, the result of the industry practices of map-makers themselves.

Response by

**Sheila O'Connell**, Former Curator of British Prints, British Museum

### Day 5: Response to figure 7

*A New and Exact Map of Toryland* (fig. 7) was published in March 1729 as a warning against the combined threats of Jacobitism and Roman Catholicism. Although there was real concern at the time about the danger of a renewed European war, references are to recent domestic issues, notably the so-called Atterbury Plot of 1722 to restore the Stuart monarchy. The immediate motive of the designer of the *Map* may have been to boost support for Robert Walpole's Whig government, and to counter opposition within his own party by generating anxiety about sedition.



**Figure 22.**

William Hogarth, Simon Lord Lovat, 1746, etching on paper, 35.8 × 23.1 cm Digital image courtesy of Trustees of the British Museum

By the early eighteenth century, visual satire was well established in the propaganda arsenal, and blossomed at times of crisis. One of Hogarth's earliest forays into satire was a response to the South Sea Bubble financial scandal of 1720. In his print of 1721, priced at one shilling—twice the price of the *Map of Toryland*—Hogarth was already aiming at an audience that would appreciate the quality of his artistic talent as well as his skill as a story-teller. He tended to avoid overtly political subjects and his great “Progresses” were based on traditional themes—the girl who goes to the bad, the spendthrift youth, unequal marriage—treated with a new attention to the naturalistic depiction of urban life. He did, however, sometimes venture into politics, on one occasion with a Jacobite subject: his enormously successful print of Simon Fraser, Lord Lovat, the veteran supporter of the Young Pretender in the 1745 Rebellion. Hogarth's print of Lovat, “Drawn from the Life” ([fig. 22](#)), is a more sophisticated version of the cheap portraits of notorious criminals that found a wide market at the time.

Many of those who took part in the '45 were executed in London, but Lovat's case drew particular attention, and numerous prints were made of his trial in Westminster Hall and his beheading on Tower Hill, as well as a number of fictional incidents. One anonymous publisher cashed in by using an old woodblock of the execution of Charles I to illustrate a small broadside recounting Lovat's execution and the collapse of one of the stands erected for spectators, which resulted in the death of several of those watching the grisly event ([fig. 23](#)).

The whole Execution and Behaviour,  
Of Simon Lord Lovat,



Who was beheaded on Tower-Hill, on Thursday last for High Treason.

LONDON, April 9  
**T**HIS Morning between Seven and Eight o'Clock a Detachment of about Three hundred Horse, and about One Thousand Foot Soldiers, marched through the City from the Strand to Tower Hill, to attend the Execution of Lord Lovat: And the Sheriff of this City, with the Officers, and the Executioner, went from the Marsh Tavern in Finchurch-lane to the House lined by them on Tower Hill for the said Lord Lovat, being the same that was made Use of for the late Earl of Kilmarnock and Lord Falkland.

At Ten o'Clock the Block was fixed on the Stage, and covered with black Cloth, and Three Sacks of Saw Dust were brought up to strew on the Stage.

His Coffin was likewise brought and set on the Stage, which was covered with black Cloth, with Brass Nails, Coronets, &c. and on the Lid was the following Inscription, *Simon Dominus Frater de Lovat, decollat. April 9, 1747. Aetatis 56.*

At half an Hour after Ten the Sheriff went to the Tower, and after locking some Time at the Gate they were admitted, and the Prisoner, on their giving a Receipt was deliver'd to them.

The Sheriff walked with his Lordship to the House provided for him, the Black Pallour and Pallage of the said House, the Rails enclosing a Way from thence to the Scaffold, and the Rails round the Scaffold, being all hung with Black at the Sheriff's Expense. And about Twelve o'Clock his Lordship came upon the Scaffold, and in a quarter of an Hour he with some Composure, laid his Head on the Block, which the Executioner took off at one Blow.

Just before Lord Lovat came from the Tower the Scaffold at the Ship Alderside, near Barking-Ally, which was built from that House in many Sorts, and computed to have cost near 1000 Pounds, fell entirely down; by which most shocking and unluckily Accident, we saw, eight or ten People were killed of the Spect, and many had their Arms and Legs broke, &c.

Such are the miseries, Vices of the Proprietors of these Scaffolds, who built them without the least regard to the Safety of their Fellow Creatures, whose misfired Curiosity may assure them considerably to venture their Lives on such Occasions.

Among the Number of the unhappy Persons killed is Mr. Goldsby, an eminent Woollen Draper in Black-Friars.

*On Lord LOVAT'S Execution.*  
**D**ITTYD by gentle Wind; KILMARNOCK doth  
 The Brave, BALMERINO, were on thy Side;  
 RABCLIFFE, unhappy in his Crimes of Years,  
 Steady in what he did, no Back for Truth,  
 Rebel'd his Death to destiny assign'd,  
 The Soft lamented, and the Brave oppos'd;  
 But LOVAT'S End indifferently we view;  
 True to no King, to no Religion true;  
 No Fair forgives the Fate he was doom'd;  
 No Child laments the Tyrant at his Sins;  
 No Tery pines, thinking what he was;  
 No King compassions, for he left the Cause;  
 The Brave regret not, for he was not brave;  
 The Good mourn not, knowing him a Knave.

R. 10.

**Figure 23.** Anonymous, The Whole Execution and Behaviour of Simon Lord Lovat, 1747, woodcut in broadside newspaper, 10.4 x 13.5 cm Digital image courtesy of Trustees of the British Museum

Response by

**Simon Werrett**, Senior Lecturer in History and Philosophy of Science,  
University College London

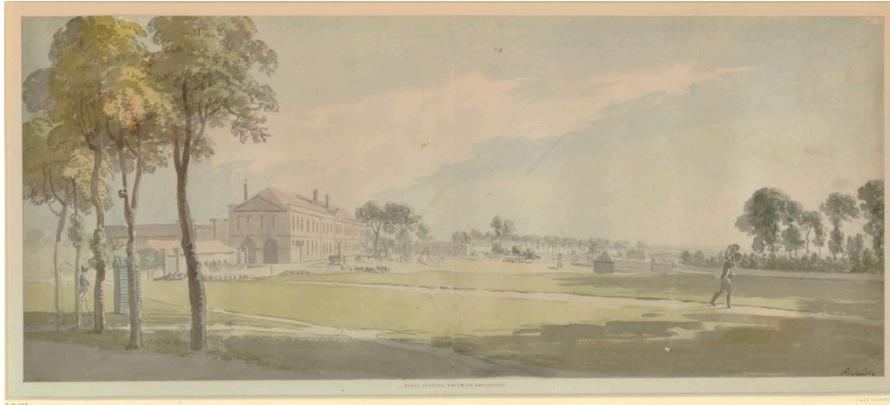
### **Day 6: Response to figure 8**

William Whiston's map ([fig. 8](#)) shows locations where a person would be able to see a ball of fire in the sky shot up from a mortar on Shooter's Hill, then a countryside location east of London. The map is a very unusual way to depict "balls of fire" in the eighteenth century, which were normally represented as shot in battle or as rockets traversing the sky in images of triumphal royal fireworks displays. One such display on the River Thames in July 1713 helped to inspire Whiston's longitude scheme, along with experiments to determine the speed of sound by timing the interval between the flash and bang of distant gunfire. A mezzotint of the 1713 display by Bernard Lens II shows the fireworks "machine", decorated with laurels, statues, and mottoes, surrounded by exploding rockets in the sky ([fig. 24](#)). It is typical of pyrotechnic images of the period.



**Figure 24.**

Bernard Lens, A representation of the Royal Fire-work, *perform'd by the directions of Coll. Hopkey and Coll. Borgard on the River of Thames before Whitehall, the 7th of July 1713, being the day appointed for a publick Thanksgiving for the General Peace, 1713*, Mezzotint, 52.4 x 41.7 cm Digital image courtesy of Trustees of the British Museum



**Figure 25.**

Paul Sandby, Royal Arsenal, Woolwich Repository, from the Green in front of the Cadet Barracks, 1968-1796, watercolour on paper Digital image courtesy of Trustees of the British Museum

Whiston's map, in contrast, divests the scene of any actual fireballs, replacing them with a geometry imagined from above. Whiston's capacity to reimagine fireworks in an abstract geometry is arguably what lay at the root of his longitude scheme, which used heights, times, and distances derived from pyrotechnic signals to allow determinations of position. The notion of abstracting fireworks from royal spectacle and applying them to other uses was highly original, and became a hallmark of English pyrotechnics after Whiston. <sup>10</sup>

Shooter's Hill, the epicentre of Whiston's map, offered an enticing mix of altitude, empty, leafy countryside, and proximity to vital resources to serve Whiston and other natural philosophers' experimental schemes. The same pastoral environment that made places like Woolwich, Greenwich, and Shooter's Hill sites of interest to eighteenth-century painters, also offered the quiet, open, and observable space that experimenters needed to make determinations of such phenomena as the speed of sound, the speed of the propagation of electricity, and the height to which "balls of fire" could be made to ascend. <sup>11</sup>

A more naturalistic picture of Shooter's Hill would reveal its more complicated textures. Daniel Defoe, in his *Tour thro' the whole Island of Great Britain* (revised 1738), noted how the hill was overgrown with coppiced woods, harvested as "Ostrey-Wood" to be used for faggots with which to light the tavern fires of London. <sup>12</sup> Artillerymen, stationed from 1716 at the nearby Woolwich Warren (later the Royal Arsenal; [fig. 25](#)), fired guns on the hill, occasionally assisting in experiments like those performed by Whiston. Another complication of the site was the notorious presence of highwaymen on the hill: "I never was so rob'd in all my Life", claimed one victim. <sup>13</sup> These

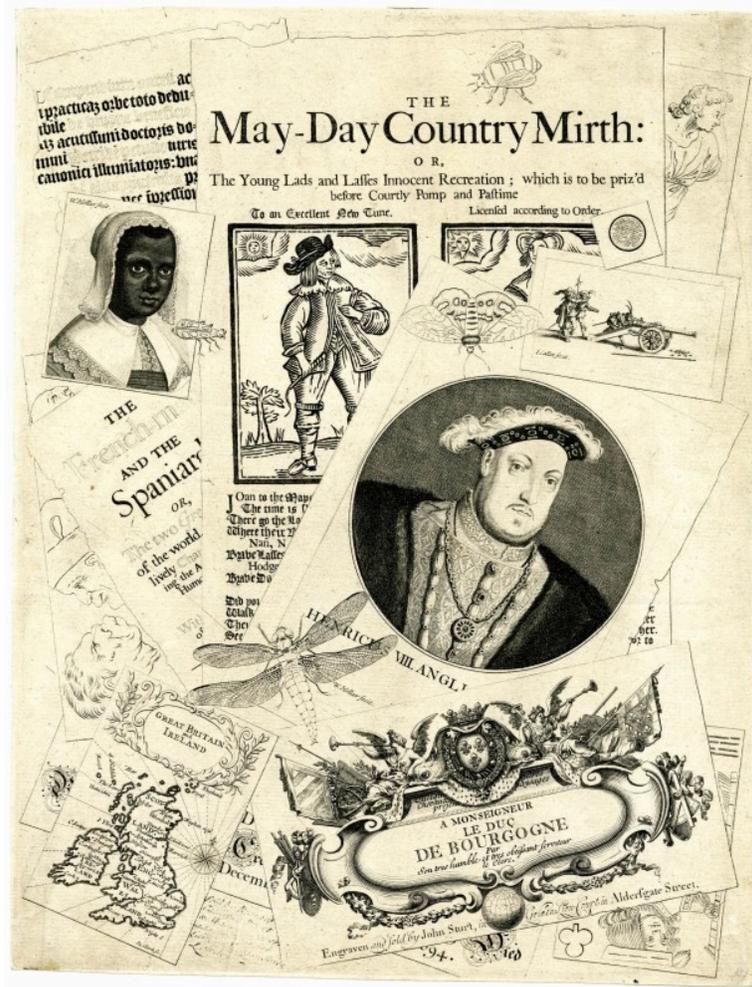
few details make apparent the pitfalls as well as the potential of Shooter's Hill as a site for experiment and for finding longitude; albeit that these problems disappear in Whiston's distanced viewpoint.

Response by

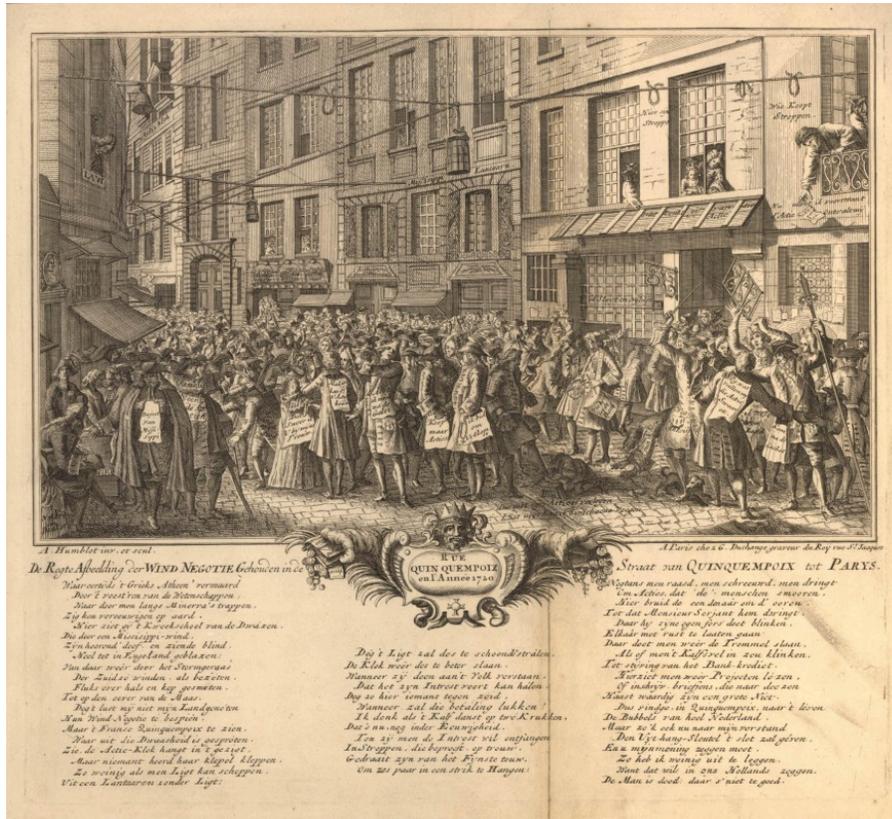
**Mark Hallett**, Märit Rausing Director

### **Day 7: Response to figure 9**

Medley prints such as *The Bubblers Medley* (fig. 9), which enjoyed a modest vogue in the early decades of the eighteenth century, functioned as playful forms of graphic masquerade. They pretended to be haphazard assortments of printed materials—engravings, newspapers, maps, title pages, playing cards, sheets of music—lying one on top of the other. Though their visual deceptions were always cheerfully transparent in character, designed to be recognized and enjoyed in an instant, medley prints provided a variety of supplementary and longer-lasting attractions for their contemporary makers and purchasers. At times, as in the case of John Sturt's *May Day Country Mirth* (fig. 26), they could serve as displays of artistic accomplishment and ingenuity, flaunting the skills of the versatile "Penman" and asking to be appreciated as elaborate kinds of graphic puzzle. They could also be deployed as a means of advertisement, offering an indication of the range of products that were on offer at an individual print-seller's premises. At other times, as in the case of *The Bubblers Medley*, they acted as the vehicles of visual and literary satire, and offered viewers a multi-layered commentary on the political and social issues of the day.



**Figure 26.** John Sturt, *The May-Day Country Mirth*, 1706, etching, 33.8 × 26.1 cm Digital image courtesy of Trustees of the British Museum



**Figure 27.** Antoine Humblot, *De Regte Afbeelding der Wind Negotie Gehouden in de Straat van Quinquempoix tot Parys*, 1720, etching, 33.2 x 36.8 cm Digital image courtesy of Trustees of the British Museum

Like the publications that disseminated the debates on longitude, objects such as *The Bubblers Medley* need to be imagined being circulated across a variety of spaces, both public and private. Medleys were open to being scrutinized, discussed, and passed between companions in both the intimate environments of the home and the more expansive arenas of the city—they were as much the creatures of the coffee house as of the study. In the instance of *The Bubblers Medley*, this mobile and topical pictorial genre is exploited to lampoon the deluded forms of speculation associated with the great economic crash that has come to be known as the South Sea Bubble, and that wreaked havoc across Europe’s financial markets in 1720. In Britain, thousands of investors, having poured their fortunes into a succession of ever-more outlandish stock schemes sponsored by the South Sea Company, found themselves ruined when the price of stock came crashing down in the autumn of that year. In the aftermath of the crash, public credit was undermined and political debate violently polarized. The various images and texts in *The Bubblers Medley*—some of which reproduce Continental engravings produced in the period (fig. 27), and others of which seem to have been invented by the anonymous engraver of the print—chart the local, British topography of this financial collapse, while simultaneously invoking

the broader, European crisis of which the South Sea Bubble was a part. In *The Bubbles Medley* we are given a glimpse of the chaotic centre of commercial speculation in Paris, Rue Quinquempoix, and a depiction of “Dutch Bubbles” wandering despairingly through the streets of Amsterdam. Closer to home, the medley pictures the crowded financial district of London’s “Change Alley”, which was a warren of streets and lanes lying near the Royal Exchange, the traditional centre of mercantile activity in the city. The area became the symbolic focus of the extended post-mortem on the Bubble, and was relentlessly castigated by commentators as a dangerous environment of delusion and fantasy, even of madness.

If the contents of the various objects on show in *The Bubbles Medley* serve to offer a dense satirical response to the crisis, so too do other aspects of the print, if in more subtle ways. The engraving’s unstable layout, in which certain images are tilted and sent gently spiralling across the picture plane, provides a nice metaphor for the chaotic, unstructured dynamics of the crash itself. Similarly, the print’s exploitation of the power of deception in its very workings—and the transparency of that deception—places *The Bubbles Medley* in ironic alignment with the flimsy forms of illusion that were seen to have been central to the workings of the Bubble and to environments such as Exchange Alley. Finally, the medley’s collage-like approximation of a series of paper commodities serves to dramatize its relationship to the wider paper culture associated with the Bubble. This culture included the realms of satire and newsprint that are gestured to in the print’s contents, but it also included the slew of printed proposals that had driven the mania to invest in the first place, of the type that can be seen brandished by deluded subscribers within the print’s overlapping images. *The Bubbles Medley*, in its own internal fabric as much as in its more explicit narratives, thus offers a memorial both to the events of the “year 1720”, and to the dizzying and deceptive mass of ephemeral paper products through which that same year had been shaped and described.

Response by

**Koji Yamamoto**, Assistant Professor in Business History, University of Tokyo

### **Day 8: Response to figure 10**

The frontispiece to William Hunt's *The Projectors: A Comedy* (fig. 10) sets the scene inside a stately building in Georgian London. The high ceiling is accentuated by two magnificent columns that surround a tall window overlooking another large building. This architectural elegance serves to highlight the human confusion unfolding at the centre. Seven men and a woman are in the middle of busy conversations or transactions, many carrying in their hands and arms parchments or papers about their favourite "projects"—the most visible of them being a scheme for discovering longitude at sea. "Are the Lords sitting?", cries one projector, urging the doorkeeper to present his paper "immediately". He captures the hyperbole typical of the project proposal at this time: "Ay, it is a Matter of general Benefit to the Nation that I have to offer; and therefore it is not fit that I should wait." <sup>14</sup>

By the time the play was published in 1737, such scenes of hurly-burly had become something of a commonplace. Already in 1697, Daniel Defoe described projectors as modern thieves worse than highwaymen:

A meer Projector then is a Contemptible thing, driven by his own desperate Fortune to such a Streight, that he must be deliver'd by a Miracle, or Starve; and when he has beat his Brains for some such Miracle in vain, he finds no remedy but to paint up some Bauble or other, as *Players make Puppets talk big*, to show like a strange thing, and then cry it up for a New Invention. <sup>15</sup>

The play dramatizes precisely this image of the projector as miserably incompetent, amusingly desperate. As the plot unfolds, the gullible Sir Solomon Saphead only narrowly escapes the projectors' snares: he nearly ruins his family dynasty by marrying a daughter to the arch-projector Drainwell and by liquidating his land to invest in alchemical experiments and other schemes of dubious credibility. The frontispiece thus nicely epitomizes the moralizing message that had been repeated over and over again in the early eighteenth century: the discovery of longitude could be as dubious and dangerous as the discovery of the philosopher's stone; poverty-stricken projectors could bring ruin even to ancient families like the fictional Sapheads.



the play such as *Drainwell* and *Shirtless* do. The promise of serving the public and the empire was in fact shared across men of varying technical expertise, theoretical sophistication, disposable income, and access to social networks and institutional membership. Few escaped damaging laughter or the satirical gaze.<sup>17</sup> In reality, therefore, the distinction between the unreliable projector and the purveyors of reliable science was worryingly slight. The frontispiece obscures this inconvenient truth about public science in the age of Hogarth, inviting us instead to accept the comforting clarity between the desperate projector and the diligent, reliable, natural philosopher.

Response by

**Greg Lynall**, Reader in English, University of Liverpool

### **Day 9: Response to figure 11**

The Longitude Act established a competitive environment which gave licence to a war of words between rival entrepreneurs who recognized, especially, the unique cultural power of laughter. Irony, lampoon, and caricature were not off-limits rhetorically within longitude proposals, and the satiric scrutiny subjected to competing schemes challenges our twenty-first-century sense of appropriate discourse in scientific/technical writing.<sup>18</sup> *The Longitudes Examin'd* by Jeremy Thacker (1714; [fig. 11](#)), however, took such ironic deprecation to another level, seeking to expose not only the inadequacy of recent proposals, but also—by brazenly declaring its own mercenary interest—the fake modesty of other projectors. Whilst Thacker's technical achievements have been lauded by some horologists, a case has been made for the parodic intention of the work as a whole, with its authorship attributed to the group of writers now known as the Scriblerians, and particularly Dr John Arbuthnot, physician, mathematician, and Fellow of the Royal Society ([fig. 29](#)).<sup>19</sup> Certainly, Arbuthnot's letters attest that he had been indulging his mathematical ability and comic imagination whimsically in the design of impractical, but technically astute longitude solutions, such as a signalling network of light-houses, not dissimilar to an anonymous proposal put forward (apparently seriously) later that year.<sup>20</sup>



**Figure 29.**

Unknown artist, John Arbuthnot, physician and man of letters, 18th century, oil on Canvas, 91.5 × 71 cm Digital image courtesy of Wellcome Library London

As Physician-in-Ordinary to Queen Anne, Arbuthnot lived in apartments at St James's Palace, and there hosted meetings with his fellow wits, including Jonathan Swift, Alexander Pope, and John Gay, in which they laid plans for their collaborative *Memoirs of Martinus Scriblerus* (published 1741), a mock-biography of a buffooning natural philosopher, antiquarian, and projector, whose parodic schemes include several longitude methods.<sup>21</sup> Upon the Queen's death in August 1714, Arbuthnot moved to Dover Street in Piccadilly, where he continued to generate scientifically inspired mirth both individually and collaboratively, in works such as *The Humble Petition of the Colliers* (1716). Swift, meanwhile, returned to Ireland, where his experience of the longitude endeavour took on a more tragic colouring, as he tended to the needs of his friend Joseph Beaumont, an amateur mathematician whose mental illness (and eventual suicide in late 1726) was attributed to an obsession with solving the longitude problem. The psychological frailties of

the projectors in the fictional Academy of Lagado (witnessed by Swift's most famous literary creation, Lemuel Gulliver) perhaps owe something to Beaumont, whom Swift had attempted to commit to Bedlam in 1722.<sup>22</sup> Swift's friend, who died nearly a decade prior to the appearance of *A Rake's Progress*, therefore seemed to confirm that longitude lunacy was more than just a satirical trope, and that the Longitude Act had human, as well as economic, costs.

Response by

**Jim Bennett**, Keeper Emeritus, Science Museum

### **Day 10: Response to figures 12 and 13**

William Hobbs offered to demonstrate his timekeeper by displaying it in a London coffee house. This would have been a demonstration in at least two ways: the clock would be on display and, hopefully, admired for its craft and quality, but presumably it would also be going, and so would prove its success in keeping time. Public demonstration of experimental philosophy as a form of rational entertainment became common in eighteenth-century London, and makers were at the forefront of what, for them, was a new way of advertising their services and developing their market. As well as demonstrating instruments to individual customers in their shops, they adopted more formal media by writing textbooks and giving series of subscription lectures illustrated by experiments. Visitors to London were astonished to see that natural philosophy had become a part of public commerce. Lecturers independent from makers might offer sessions in coffee houses, while one of the centres for the makers' shops was Fleet Street.



**Figure 30.**

Plaque on George Graham's house in Fleet Street, Digital image courtesy of Jim Bennett

John Harrison became part of this public culture as he sought to promote the reputation of his early timekeepers. In 1736, when his first machine was sent for trial on a voyage to Lisbon, the First Lord of the Admiralty told the ship's captain that "The Instrument which is put on Board your Ship, has been approved by all the Mathematicians in Town that have seen it, (and few have not)." <sup>23</sup> The astronomer John Bevis saw it at the workshop of the watch, clock, and instrument maker George Graham in Fleet Street the previous year (fig. 30), and the antiquarian William Stukeley also records seeing it there. After he moved to London, Harrison had a special viewing room in his house where his timekeepers could be seen working; Benjamin Franklin paid to view them in 1757, while Harrison's friend James Short reported that the first timekeeper "was seen by every curious and ingenious person, who were pleased to go to his house". <sup>24</sup>

Thus Harrison and his sea-clocks joined the London fashion for experimental display. The contrast between the mechanical elegance of the clocks and the provincial manner and speech of their maker must have impressed his visitors; his explanations, even when he was prepared to offer any, were far from lucid, and this disparity was no doubt part of the spectacle. Harrison came to be seen as someone who had a very special and individual rapport with the mechanical world, while his lack of education meant that this had not been destroyed through schooling or learning. This was all very well early on in his career: visitors were intrigued by the conceit of “nature’s mechanic”. But it became a handicap later, when however successful his fourth timekeeper had been in trials at sea, for a solution to the longitude problem it became imperative to show that examples could be readily made by artisans of a more common “genius”.

Response by

**Hannah Williams**, Leverhulme Early Career Research Fellow, School of History, Queen Mary, University of London

### **Day 11: Response to figure 14**

Hogarth's London studio, which he occupied in the early 1730s, was situated in a tall terraced house on Leicester Square, third from the end in the south-east corner. Outside his house, to advertise his trade, Hogarth hung a shop sign—a portrait bust of Anthony van Dyck—supposedly fashioned from gilded cork by Hogarth himself.<sup>25</sup> Despite such anecdotal details, Hogarth's Leicester Square studio is a difficult space to access now, particularly since its demolition in the nineteenth century. In this it forms a contrast with his other London residence—his country house at Chiswick— which is today part of London's historical tourism trail. Hogarth bought his country retreat in 1749 and lived there until his death in 1764, painting in a studio at the bottom of his garden, where he could escape the hectic life of the city. As Hogarth's two different painting rooms attest, artists' studios in the eighteenth century were not homogeneous spaces; their characters were determined by their locations, by their use, and, above all, by the persons who inhabited them. Studios were working spaces, commercial spaces, social spaces, educational spaces, and domestic spaces.<sup>26</sup> But interestingly enough, they were not yet the aestheticized spaces they would become in the following century. Not until the Romantic period did the artist's studio become a common subject of representation, which makes the images of eighteenth-century studios that do exist all the more intriguing.

One unusual articulation of a London studio was painted by the young, and otherwise little-known American painter Matthew Pratt, whose *The American School* (fig. 31) depicts the London studio of Benjamin West. As its title suggests, Pratt's work is something of a celebratory statement about "the coming of age of American art", localized in the space of this great American master's studio.<sup>27</sup> But rather than as a site of superlative artistic production, Pratt presents West's studio first and foremost as a space of learning. Standing on the left, West instructs his students and imparts his wisdom as they move progressively through the stages of artistic training; from the youngest at the back copying a plaster cast, to the two youths engaged with drawing apparatus and, finally, to the young painter (presumably Pratt himself) starting to transform a blank canvas under the eye of his teacher. Three years before the founding of the Royal Academy, private studios still served as key sites for academic pedagogy. As a depiction of the studio, however, with its full-length figures occupying the majority of the picture's surface, Pratt's painting is really more a group portrait or conversation piece

than a representation of the studio space. Perhaps suggestive of his abiding sense of the studio as a space of sociability, Pratt is concerned with the denizens of the studio and the activities that took place there, but very little with the nature of the place itself.



**Figure 31.**

Matthew Pratt, *The American School*, 1765. oil on canvas, 91.4 × 127.6 cm Digital image courtesy of Metropolitan Museum of Art, New York



**Figure 32.**

Emily Calmady, *Sir Thomas Lawrence's Studio, 65 Russell Square, London*, 1824, 1824, graphite and white gouache on medium, moderately textured, beige, wove paper, 22.9 × 43.5 cm Digital image courtesy of Yale Center for British Art, Paul Mellon Fund, B2006.6

In complete contrast is Emily Calmady's pencil drawing of *Sir Thomas Lawrence's Studio* (fig. 32) of 1824, preoccupied almost entirely with this space as a space. At first glance, there does not seem to be a person in sight in this image of the portrait painter's studio at 65 Russell Square, other than the sketchy figures on the canvases propped up around the room. But on closer inspection we find seated by the fireplace the tiny figure of one of Calmady's daughters, and then just a glimpse of Lawrence himself, reflected in the large mirror at the right, holding his palette at his easel while painting the little girl's sister for his celebrated painting of *The Calmady Children*.<sup>28</sup> An amateur artist, Calmady presumably depicted the studio during her daughters' sittings, but the scene is as remarkable for capturing the setting as it is the moment. The room is filled with the furniture and clutter of a working studio, all depicted in exquisite detail, from the subjects on the stacked canvases at the left, to the table of brushes in the middle, and the drawers and bench on the right housing pigments, a muller, bottles of oil, rags, and other paraphernalia for the messy business of mixing paint. Yet despite the details recording Lawrence's studio as a lived environment, the vast empty space dominating the foreground of Calmady's scene gestures to something else. Evoking the emerging Romantic visual topos of the studio as an interior space that exteriorizes the interiority of its creative inhabitant, Calmady's drawing of Lawrence's studio seems not only to grant access to his private domestic realm, but to go one step further, offering an intimate encounter with the man himself.

## Footnotes

- <sup>1</sup> The basic iconography of the print is outlined by Ronald Paulson, *Hogarth's Graphic Works* (Print Room: London, 1989), 98.
- <sup>2</sup> As described in the Longitude Act (12 Anne c.15). RGO 14/1:11r, Papers of the Board of Longitude, Cambridge University Library. Accessible through Cambridge Digital Library <http://cudl.lib.cam.ac.uk/collections/longitude>
- <sup>3</sup> For discussions of the broader history of the longitude problem and the Board of Longitude, see William J. H. Andrewes, ed., *The Quest for Longitude: The Proceedings of the Longitude Symposium, Harvard University, Cambridge, Massachusetts, November 4-6 1993* (Cambridge, MA, 1996), and Richard Dunn and Rebekah Higgitt, *Finding Longitude: How Clocks and Stars Helped Solve the Longitude Problem* (London: Collins, 2014).
- <sup>4</sup> "Sir Isaac Newton's Opinion", BGN/1, Barrington Papers, National Maritime Museum, Greenwich.
- <sup>5</sup> John Flamsteed, *The Correspondence of John Flamsteed, The First Astronomer Royal, vol. 3, 1703-1719*, ed. Eric G. Forbes (Bristol: CRC Press, 2001), 712, Letter 1366.
- <sup>6</sup> *The longitude discover'd; A tale. By the Author of the Deluge, and Bottomless tub* (London: J. Roberts, 1726), 12.
- <sup>7</sup> Flamsteed, *Correspondence*, vol. 3, 715, Letter 1368.
- <sup>8</sup> The story of Harrison's interactions with the Board of Longitude has been made famous by Dava Sobel's *Longitude: The True Story of a Lone Genius Who Solved the Greatest Scientific Problem of his Time* (London: Walker, 1995). Some of the more exaggerated elements of her story have been redressed by Dunn and Higgitt, *Finding Longitude*. Despite his complaints, it seems that Harrison was the first to present a proposal serious enough for the Commissioners to meet.
- <sup>9</sup> This was petitioned for by Hogarth and six other artists to vest copyright in engraved images for the first time. Act 8 Geo.2 c.13, Parliamentary Statutes online.
- <sup>10</sup> Simon Werrett, *Fireworks: Pyrotechnic Arts and Sciences in European History* (Chicago: University of Chicago Press, 2010), 96-99.
- <sup>11</sup> William Derham, "Experimenta & Observationes de Soni Motu, Aliisque ad id Attinentibus, Factae a Reverendo D. W. Derham Ecclesiae Upminsteriensis Rectore, & Societatis Regalis Londinensis Socio", *Philosophical Transactions* 26 (1708-9): 2-35; William Watson, *An account of the experiments made by some gentlemen of the Royal Society, in order to discover whether the electrical power would be sensible at great distances* (London, 1749), 48.

- 12 Daniel Defoe, *A tour thro' the whole island of Great Britain, divided into circuits or journies*, rev. edn (London, 1738), 143.
- 13 William Shakespeare, "The History of Sir John Oldcastle", in *The works of Mr. William Shakespear . . . Adorn'd with cutts*, ed. N. Rowe, 8 vols. (London, 1714), 8: 181-249 (194).
- 14 William Hunt, *The Projectors: A Comedy* (London, 1737), 12.
- 15 Daniel Defoe, *An Essay upon Projects* (London, 1697), 33-34 (original italics).
- 16 J. T. Desaguliers, *A Course of Experimental Philosophy, Vol. 1*, 2nd edition corrected (London, 1745), 138.
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