NEWTON’S GIFT TO ROGER COTES

by

BRUCE BRADLEY*

Linda Hall Library of Science, Engineering and Technology, 5109 Cherry Street,
Kansas City, MO 64110, USA

In 1712 Isaac Newton sent a portrait of himself to Roger Cotes, who was then working with
Newton as the editor of the second edition of Newton’s *Principia*. Cotes acknowledged the
gift with thanks in a letter to Newton, but the identity of the portrait, presumed to be an
engraving done from one of the original portraits in oil, is a mystery. There are only a
few engraved portraits to consider as possibilities. Two of them have been suggested as
the portrait that Newton sent to Cotes, but an examination of the dates of those
engravings rules out that possibility. A third possibility exists as a unique print in the
collection of the Wellcome Library, and it now seems a better, if not the only, candidate.

Keywords: Roger Cotes; Isaac Newton; James Thornhill; John Simon;
Godfrey Kneller; portraits

The young Cambridge mathematician Roger Cotes, who edited the second edition of Isaac
Newton’s *Principia*, received no monetary payments for his efforts. What may be even
worse, he received no credit. The acknowledgement that Newton had written for the
preface was suppressed, and references to Cotes in the text were also removed.1 In the
midst of the editing process in 1712, however, Cotes received a gift from Newton. It may
have been the only material reward he received for his editorial work and his association
with Newton. He mentioned it at the end of a short letter dated 20 July 1712. Most of the
letter is about not having received any of the additions to the text that Cotes had been led
to believe, three weeks earlier, were on the way. It concludes with an acknowledgement
of the gift, which was an engraving of Newton that had been delivered by Richard
Bentley. Cotes compared it to an earlier engraving, and also to an original portrait in oil
by James Thornhill: ‘I thank You for the Picture which I have received of him [Bentley]:
‘tis much better done than the former; but I could have wish’d it had been taken from the
first of Mr Thornhill’s.’2

It was a common practice for a man of renown to give engraved portraits of himself to
friends and associates.3 Engraved portraits were typically not original works of art, but
were copied from already existing portraits. For Newton, the most famous engraved
portrait is probably the one of him at the age of 83 years that appeared as the frontispiece
in the third edition of *Principia* (1726) (figure 1). The engraving is by George Vertue,
after a painting that he had done in 1726, which was itself a copy of an original portrait
by John Vanderbank.4 Even though the iconography of Isaac Newton has been well
studied, the identity of the particular ‘Picture’ given in 1712 to Roger Cotes remains a
matter of conjecture.

In 1712 there were few engraved portraits available that Newton could have sent as a gift
to Cotes. In fact, only four engraved portraits of Newton that were done during his lifetime
have been noted.5 One of these is the frontispiece mentioned above from 1726 (figure 1).
A second, also from 1726 and also based on the Vanderbank portrait, is a mezzotint that
was engraved by John Faber. That leaves only two that might have been available for
Newton to send as a gift in 1712. One of these engravings (figure 2) is based on Godfrey
Kneller’s portrait of 1702, and the other (figure 3) is engraved after a portrait by James
Thornhill of 1710. Both of these have been suggested as the engraving that Cotes
received but, for reasons that will be given below, neither could have been that engraving.
There is a fifth engraving, also based on the Thornhill portrait, which may date to this
period. That now seems to be the only possibility for Newton’s gift to Cotes (figure 4).

Cotes must already have seen one of the earlier prints, because he judged his new print
‘better done than the former’. The ‘former’ print was most probably the engraving by
John Smith, after a half-length portrait by Godfrey Kneller of 1702, showing Newton at
the age of 59 years (figure 2). The engraving is an oval mezzotint portrait of an
elaborately long-wigged Newton.⁶ The editors of Newton’s correspondence suggested that this engraved portrait was the gift that Cotes referred to in his letter,⁷ but it is dated 1712, and it is the earliest known engraved portrait of Newton. As such it is logically the only possibility for the ‘former’ portrait referred to by Cotes.

An engraving at the Linda Hall Library by John Simon after a portrait by James Thornhill (figure 3) also has been suggested as the portrait that Cotes received in 1712 and referred to in his letter, and there are good reasons for considering it.⁸ Thornhill’s portrait of Newton was commissioned by Richard Bentley, master of Trinity College, and completed in 1709 or 1710.⁹ This was ‘the first [portrait] of Mr Thornhill’s’ mentioned by Cotes in his letter to Newton. Bentley had also referred to the Thornhill portrait in a letter to Newton of 20 October 1709, which was again mostly about matters related to the second edition of Principles but ended with a note that ‘I hope my Picture at Thornhill’s will have your last Sitting, before you leave the Town: the time you set under your Hand is already lapsed.’¹⁰

It is hard to see Bentley’s commissioning of that portrait as anything but a self-serving attempt to influence Newton, if not an outright bribe. Bentley was undertaking changes in the traditions and administration of Trinity College, and he wanted Newton’s support for
those reforms. He also wanted, and had convinced Newton to produce, a second edition of *Principia*.\textsuperscript{11} Bentley undertook the expense of publishing the edition at the university press at Cambridge, but he was also to receive the profits. Copies of the first edition were already scarce, and Bentley judged that there was sufficient demand for a new edition to make it sell well. He was right. When the second edition of 700 copies of *Principia* finally appeared in 1713, Bentley quickly began to realize a healthy return on his investment. His profit was nearly double the cost of printing by the end of 1715, when only 71 copies remained unsold.\textsuperscript{12} None of the financial gain, as mentioned, was shared with Roger Cotes.

During the writing and editing of the second edition, it would have been important for Bentley to keep Newton on task. Newton had plenty of other things to occupy his mind and time. This period was the height of his priority dispute with Leibnitz over the calculus—a dispute that virtually halted his work on the second edition of *Principia* in 1711.\textsuperscript{13} He had been actively presiding over the Royal Society as President since 1703. He also had his full-time government job as Master of the Mint. The rigorous

---

Figure 3. Mezzotint portrait of Isaac Newton, by John Simon, 1720 or later, after Sir James Thornhill. A copy of this print at the Fitzwilliam Museum, Cambridge (P.49-1951), matches the Linda Hall Library print. A copy in the National Portrait Gallery, London (NPG D19639), is a variant state, with no address for John Simon in the caption, and slight variations in the facial features. (Reproduced courtesy of the Linda Hall Library of Science, Engineering & Technology.)
mathematics required for the revisions of the second edition also demanded that he be actively engaged in the process, and he was. In 1710, just after Thornhill’s portrait was completed, Newton entered into correspondence with Roger Cotes that was a scientific exchange without parallel, according to Richard Westfall. After drawing Newton into the exchange of letters, ‘Cotes exposed him again to the original excitement of his great work.’

Letters from Cotes and from Bentley asking Newton to address detailed mathematical problems, to perform certain revisions and to supply other sections that he had promised would have been a source of irritation rather than excitement. For Newton or for anyone, reminders of unfulfilled obligations are never particularly welcome. By commissioning a portrait from one of England’s leading artists, Bentley was shrewdly softening the irritation, especially for Newton who, at this point in life, became particularly interested in leaving his image for posterity. Driven by vanity or some other reason, Newton sat for so many portraits after 1702, when he had reached the age of 60 years, that Westfall described his desire for them as an obsession.

James Thornhill’s portrait of Newton shows him seated, with no wig and with short hair that emphasizes a high forehead. Thornhill was one of England’s greatest scenographic, or history, painters, known for his decorative painting of historical scenes on walls and public spaces. His portrait of Newton could have come right out of one of these scenes.
Newton gazes into the distance, while behind him a storm on the horizon clouds the light of the setting sun. He is dressed in robes, suggesting a classical philosopher rather than a seventeenth-century English academic or government official. There is no known engraving that was done from this ‘first of Mr. Thornhill’s’, which Bentley gave to Trinity College, where it still hangs. There are, however, two other versions of the portrait that are considered compositional variations and are probably the product of a second sitting (figure 5). This was not an unusual practice for Thornhill, who sometimes produced widely varied alternative versions for a project as oil sketches. Here, the alternative versions are finished portraits.  

John Simon’s engraving (figure 3) is based on these variations, one of which is in the collection of the Earl of Portsmouth. The other is displayed at Newton’s boyhood home, Woolsthorpe Manor. A distinguishing feature in these variant portraits is the direction of Newton’s eyes, which stare directly at the viewer. In the ‘first of Mr Thornhill’s’ portraits, Newton gazes into the distance. Maybe that is what Cotes did not like—Newton looking directly at him—when he wished the engraving had been done from the first portrait by Thornhill. Another feature of the variations is the use of classical columns for the

Figure 5. Isaac Newton, a portrait by Sir James Thornhill, (1675–1734) painted ca. 1709–12, in the Study at Woolsthorpe Manor, Lincolnshire. (Reproduced courtesy of the National Trust photolibrary.) (Online version in colour.)
background instead of a distant landscape. Cotes may have simply judged the original portrait more dignified, and meant his comment only as a compliment. Bentley would probably have liked the fact that the engraving was based on a portrait he commissioned, as it would serve to remind Newton and anyone else of Bentley’s generous gesture towards Newton, and thus, indirectly, of Newton’s obligation to continue working on the second edition.

So it would seem quite reasonable for Bentley to have been pleased to be the messenger who carried an engraved portrait from Newton in London to Cotes in Cambridge that was based on the Thornhill portrait that he, Bentley, had commissioned. But it could not have been the engraved portrait done by John Simon. That portrait is not dated, and the evidence suggests it was printed much later than 1712, even though that date has been assigned to it.17

The engraving is elaborately lettered with this caption at the bottom:

Isaacus Newton Eq: Aura
I. Thornhill Eq. pinx I. Simon fec. Sold by I. Simon in New Street Covt Garden

Newton was knighted in 1705, so the designation after his name, ‘Eq[ues] Aura[tus]’ (Knight Bachelor) is correct and perfectly appropriate. James Thornhill was knighted in 1720, however, so the designation after his name, ‘Eq[ues] (Knight)’, suggests a much later date for the engraving—1720 or later.18 John Simon’s address also is given on the engraving as New Street, Covent Garden. He sold prints from several locations in London, but not from that address until after 1720.19 John Simon’s engraved portrait could not have been the one that Newton sent to Cotes in 1712.

There is one other possibility for the portrait that Cotes received as a gift, and that is an engraving similar to the one by Simon. It, too, is taken from one of the compositional variations of the Thornhill portrait. The eyes look directly at the viewer, and the index finger of the hand held in front of the breast is pointing. There seems to be only one known copy of this print, and it is at the Wellcome Library20 (figure 4). The border of that copy has been trimmed so that there is no lettering at the bottom or any identification. The date and engraver are unknown, and this engraving seems in fact to be unnoticed in any of the standard catalogues of engraved portraits. Henry Bromley’s Catalogue of engraved British portraits, for example, lists a mezzotint engraving by John Simon after James Thornhill with a date of 1723 that probably refers to the engraved portrait by John Simon discussed above. It does not list a second mezzotint after Thornhill.21 John Chaloner Smith’s British mezzotinto portraits also lists only one engraving by Simon after the Thornhill portrait, and his description again matches the Simon engraving previously mentioned.22

The engraving at the Wellcome Library could be a reverse, that is, a chiral copy of the mezzotint by John Simon, and it would thus date from the 1720s or later. In making a copy from an original print, it was common for sculptors in the earlier tradition of woodcut prints to make the orientation of the carved image match the original print. Engravers often did the same thing when preparing a copperplate. The printed image from the new copperplate (or woodblock) would be in reverse, however, and resemble a mirror image of the original print. By copying a print of the Simon portrait onto a copperplate so that the orientation matched, the resulting printed version would be reversed. Instead of Newton’s finger pointing to the right edge, it would point to the left, as it does in the Wellcome print.
There is drapery in the background of the Thornhill portrait, however, and also in the Wellcome print. The Simon engraving has none, which means that the Wellcome print is more likely to have been copied after one of the Thornhill variations, and thus to date from 1711 or 1712. So there is a good chance that a copy of this mezzotint engraving is the one that Cotes received as his gift in 1712. Because it was based on the recent portrait by Thornhill, it would have resembled Newton as he was known to Cotes and Bentley at that time. It would have been up to date, making it quite natural for a gracious recipient to comment that it was ‘better done than the former’ engraving by Smith, the one with the long wig that was based on the by then 10-year-old portrait by Kneller. The editor of the second edition of *Principia* left us wondering exactly which engraved portrait he received from Newton in 1712. Of the known engravings published in Newton’s lifetime, this seems to be the only candidate we have.

The curious thing is that there is only one known example of this mezzotint. If Newton was in the habit of giving out engraved portraits of himself, and if this was judged ‘better done’ than others, where are the other copies? The answer may be as simple as that they have ended up in the rubbish heap. Owen Gingerich has convincingly demonstrated, using examples of some famous rare books, that thick ones survive in more copies than thin ones.\(^{23}\) And these thin books, one could conclude, will have a better chance of surviving in multiple copies than single-sheet prints. A print by its very nature is ephemeral, easy to lose, damage or throw away after the interest of the original owner diminishes or is not shared by his or her heirs. Libraries and museums recognize the collectability and importance of ephemera, however, especially the special category of prints, and have long collected them. Perhaps there is at least one other example of the Wellcome mezzotint of Newton in another collection that retains an identifying caption, one that might give more of a clue as to whether or not a copy of this print was, in fact, Newton’s gift to Roger Cotes.

**ACKNOWLEDGEMENTS**

I am grateful to Dr William B. Ashworth Jr for comments on drafts of this paper, and to two anonymous referees for helpful comments. I am also grateful to library staff at the Wellcome Library, at the Linda Hall Library and at the Nelson-Atkins Museum of Art.

**NOTES**

3. *Ibid.*, vol. 5, p. 316, n. 5. The editors remark that it ‘was quite normal’ practice; indeed, giving gifts of portraits or artworks was an established sign of patronage. On p. 348 of *Possessing nature* (University of California Press, Berkeley, 1994), Paula Findlen notes that ‘Vincenzo I could imagine no greater gift to a client than a portrait of himself.’ Patricia Fara, in *Newton: the making of a genius* (Columbia University Press, New York, 2002), p. 35, also notes the importance of the exchange of portraits in patronage networks.
Newton’s gift to Roger Cotes


5 Ibid., p. 3. Although Keynes notes four engravings of Newton before 1727, one by John Simon after Kneller’s 1702 portrait may date to that period as well. Such an engraving was noted by Henry Bromley, A Catalogue of Engraved British Portraits (London, 1793), p. 235, but by no one else.

6 Keynes, op. cit. (note 4), no. XLIII–1. After Kneller, 1702 (no. III–1).

7 Newton, op. cit. (note 2), vol. 5, p. 316, n. 5.


9 Ibid., no. IV–1. In his sixty-ninth, oil on canvas, 1709–11.

10 Newton, op. cit. (note 2), vol. 5, p. 8, letter 767.


14 Ibid., p. 706.


17 Keynes, op. cit. (note 4), no. XLV–1. There is some confusion in Keynes’s description, which describes the Simon engraving but reproduces instead an uncaptioned portrait from the Wellcome Institute, discussed below.

18 Ibid., p. 20. Milo Keynes notes that the compositional variation of Thornhill’s portrait of Newton in the collection of the Earl of Portsmouth is signed ‘Sir James Thornhill’ and that the inscription must therefore have been added after 1720. He notes that an earlier inscription on the canvas has been partly removed.


