

Addenda to John Prujean's 1701 Catalogue of Mathematical Instruments

An article published in this journal in 1993 identified copies of a handful of ephemeral letterpress instruction sheets associated with the instruments listed in John Prujean's 1701 catalogue of mathematical instruments.¹ A further copy of one of these items plus three further and hitherto unrecorded Prujean instruction sheets have recently been identified in the Warwickshire County Record Office. An additional example of a paper Prujean quadrant has also been located.

PROVENANCE

The CR136 series of the Newdigate of Arbury papers was deposited in the Warwickshire Record Office in 1960.² Any original archival sequence was lost when these papers were listed and re-organised at Arbury in 1906. Sub-section D brought together printed material, though the small group of items primarily dealing with sundials includes some manuscript items. The Prujean instruction sheets are within this group. Given a piece dated 1663 and another 1674,³ and the fact that Prujean did not appear in Oxford until March 1663/4, it is unlikely that this material was acquired by Richard Newdigate (1644–1710), second baronet 1678, whose father passed over the family's Warwickshire estates to him in December 1665 on his marriage. Richard matriculated at Christ Church 21 March 1661, was still in residence in 1662, but left without taking a degree.⁴ The most likely candidate for acquiring the material is Richard's eldest surviving son, Richard Newdigate (1668–1727), third baronet 1710,⁵ who matriculated at Christ Church 20 November 1685, aged seventeen, and who like his father did not take a degree.⁶ His brother John Newdigate (1672–1705), matriculated at Trinity, 14 July 1688, aged fifteen, is another possibility; he too did not take a degree but subsequently qualified as a barrister.⁷ As children both sons would have been familiar with the large painted mural sundial set above the impressive portal to the Arbury Hall stable block built in 1675–7.⁸

That at least one member of the Newdigate dynasty had had more than a passing interest in dialling was implicit in the fact that three of Prujean's paper instruments illustrated in the original paper, together with a mid seventeenth-century brass horary quadrant made by the

¹ D.J. Bryden, 'Made in Oxford: John Prujean's 1701 Catalogue of Mathematical Instruments', *Oxoniensia*, 58 (1993), pp. 263–85.

² <http://archivesunlocked.warwickshire.gov.uk/CalmView/Record.aspx?src=CalmView.Catalog&id=00301>.

³ Warwickshire County Record Office (hereafter WCRO), CR136/D1/78: counter-print of long scale logarithmic spiral [slide] rule – Signed: 'Henr Sutton fecit. 1663', which I identify as pulls from the instrument now in the Science Museum, London, inventory number 1964.0073; and WCRO, CR136/D1/71 – counter-print of a double horizontal dial signed 'Henry Wynne Fecit: 1674' and 'Latitude 50. 40'. In both cases there are identical pulls on each side of the sheet. Both are illustrated and discussed in B Jardine, 'Reverse-Printed Paper Instruments (With a Note on the First Slide Rule)', *Bulletin of the Scientific Instrument Society*, 128 (2016), pp. 39–41.

⁴ ODNB; E. Gooder, *The Squire of Arbury: Sir Richard Newdigate, Second Baronet, 1644–1710, and his Family* (1990), pp. 16–24.

⁵ For date of birth: F.A. Crisp, *Fragmenta Genealogica*, 12 (1906), pp. 14–16, citing notes in a family bible. For date of death see W. Betham, *The Baronetage of England*, vol. 3 (1803), pp. 19–20.

⁶ J. Foster, *Alumni Oxonienses . . . 1500–1714* (1891), p. 1060.

⁷ Crisp, *Fragmenta Genealogica*, pp. 14–16; Foster, *Alumni Oxonienses*, p. 1060.

⁸ Gooder, *Squire of Arbury*, pp. 30–3. See also <http://www.britishlistedbuildings.co.uk/en-308551-stables-at-arbury-hall>.

Shropshire almanac maker Francis Pigot,⁹ were on loan to the Oxford University Museum of the History of Science from 1926 until being returned to the Viscount Daventry at Arbury Hall in 1993.

PRUJEAN'S INSTRUCTION SHEETS

At the head of his 1701 catalogue of instruments, Prujean indicates that he also supplied 'Notes for the Use of them'. In 1993 four leaflets, A–F, describing six instruments had been located. The expanded list adds an additional copy of Prujean E, and a further three, Prujean G, H & I.

PRUJEAN A + B The *Analemma* QUADRANT, *serving for all* LATITUDES. These Notes, with all Mathematical Instruments, are Made and Sold by JOHN PRUJEAN.

with *The Altimetrick* QUADRANT, *serving to take Hights by Inspection*. These Notes, with all Mathematical Instruments, are Made and Sold by JOHN PRUJEAN in OXON.

[copy in Chethams Library, Manchester: Wing P.3884]¹⁰

Note: The text of this sheet is identical to that added to the 4th (1701) edition of R. Holland, *Globe Notes* (Oxford, 1701), in which Prujean's instrument catalogue appears on the final page.

PRUJEAN C+D *A short description of a Quadrant of the particular Astrolabe inverted*. These Notes, with all Mathematical Instruments, are Made and Sold by JOHN PRUJEAN in OXON.

with *Oughtred's Quadrant*. These Notes, with all Mathematical Instruments, are Made and Sold by JOHN PRUJEAN.

[copy in Christ Church Library, Oxford: Press Mark Hyp.B.225. Wing P.3884]

PRUJEAN E *A DESCRIPTION OF GUNTER'S QUADRANT*
These Notes, with all Mathematical Instruments, are Made and Sold by JOHN PRUJEAN in Oxford.

[copies in British Library, London: Press mark 1850.c.10(70); WCRO, CR136/D1/11/73. Wing G.2243A]

PRUJEAN F *The description of the Horological Ring-Dial, which showeth the Hour of the Day in any part of the World. This DIAL, or any other Instruments for the Mathematicks are made exactly by John Prujean living neer new College in Oxford.*

[copy in Science Museum, London: Calvert 308]¹¹

Note: It has since been established that there are earlier printings of the text of this broadsheet. One issued by London instrument maker Walter Hayes, c.1656±4, copy in the Bodleian Library, Oxford, press mark: G.Pamph 2208 (21), Wing D1160A, and another

⁹ On Pigot: B. Capp, *Astrology and the Popular Press: English Almanacs 1500–1800* (1979), p. 325. For Pigot's Delamain-type horary quadrant: A.J. Turner, 'William Oughtred, Richard Delamain and the Horizontal Instrument in Seventeenth Century England', *Annali dell'Istituto e Museo di Storia della Scienza di Firenze*, 4 (1981), p. 24 and fig. 4.

¹⁰ D. Wing, *A Short Catalogue of Books Printed in England . . . 1641–1700*, 2nd edition (1972–88).

¹¹ H.R. Calvert, *Scientific Trade Cards in the Science Museum Collection* (1971), item 308.

issued by London instrument maker Hilckiah Bedford, 1660±6 (private collection).¹² Prujean took this text without acknowledgement, not bothering to adjust it to reflect the local latitude of Oxford (51° 45'), rather than London (51° 30').

PRUJEAN G *Dialling Universal, the Lines of Lat. Hours, Inclination of Merid.Cords, Sin. Tang. Artificial Line of Decl. &c. By Joh. Prujean.*

[copy in WCRO, CR136/D1/11/79]

Note: The related engraved sheet of diagrams for sundial construction is at WCRO: CR136/D1/80. The diagrams are titled in manuscript, apparently by the same hand that inserted on the letter-press broadsheet 'BY' after the second word of the title line, plus a marginal note half-way down the first column of text. Also related to this text is a letter-press slip: WCRO, CR136/D1/11/81A, with the paragraph heading 'To find the Substiles distance, the Stiles hight, | the Inclination of Meridians by the Scales | on the Ruler; do thus,

PRUJEAN H *A Description of the ANALEMMA Useful for all LATITUDES.*

[Copy in WCRO, CR136/D1/11/81]

PRUJEAN I NEPERS RODS.

[Copy in WCRO, CR136/D1/72]

Note: The text opens: 'Nepers Rods were first found out by Lord Neper a Scotch Baron, the same that invented Logarithms and they are made with two or four flats of Wood, Metal or Ivory, whence they are also called *Nepers Bones*'. Prujean was following contemporary practice in describing John Napier, the Laird of Merchiston, as 'Baron' – though it was his son Archibald, the 9th Laird, who was created the first Baron Napier in 1627. The spelling 'Neper', (though 'Napier' in Prujean's catalogue), was also common and, like the appellation, 'Baron' influenced by the Latin title-pages of his works. For example, in 1662 Glasgow-born almanac maker James Corss referred to 'John Lord Nepper, Barron of Merchiston'.¹³ As to the terminology, Napier's calculating rods had been called 'bones' by one London commentator in 1617, the very year Napier's Latin text was posthumously published, though it was not until 1667 that William Leybourn suggested that the term was related to the use of ivory as a construction medium.¹⁴

COMMENTARY

Prujean G was presumably supplied with an appropriate dialling scale, probably printed from an engraved plate – item 19 in his catalogue. It is particularly rewarding to find the sheet of engraved diagrams still associated with it. The Newdigate archive also includes two manuscript sheets of sundial designs – one labelled 'Lat: 51.45' – that is, for Oxford –¹⁵ the other with five separate working designs for horizontal sundials and three dialling scales. On the verso of the latter sheet are a series of geometric exercises including drawings of an oval, an ellipse, and a

¹² D.J. Bryden, 'More Early Printed Ephemerata of London Instrument Makers: Instructions and Advertising Broadsheets: 1. Instructions for the Universal Equinoctial Dial, c.1650–c.1700', *Bulletin of the Scientific Instrument Society*, 79 (2003), pp. 18–22.

¹³ J. Corss, *Uranosopia: the Contemplation of the Heavens in a Perpetual Speculum* (Edinburgh, 1662) sig. A3r. It was an understandable error – given the title page of Napier's published account '*Rabdologiae, seu Nymerationes per Virgulas . . . Authore & Inventore Ioanne Nepero, Barone Merchistoni, & C. Scoto*'.

¹⁴ T. Bretnor, *A New Almanacke and Prognostication for . . . 1618* (London, 1617), sig. C8v; Napier, *Rabdologiae*; W. Leybourn, *The art of numbering by speaking rods, vulgarly termed Nepiers Bones*, (1667), p. 2. I have suggested, 'Scientific Relics: John Napier's Bones', *Bulletin of the Scientific Instrument Society*, 76 (2003), pp. 6–7, that the 1617 use of 'bones' may have been punning deference towards the recent death of the famed inventor of logarithms.

¹⁵ WCRO, CR136/D1/76.

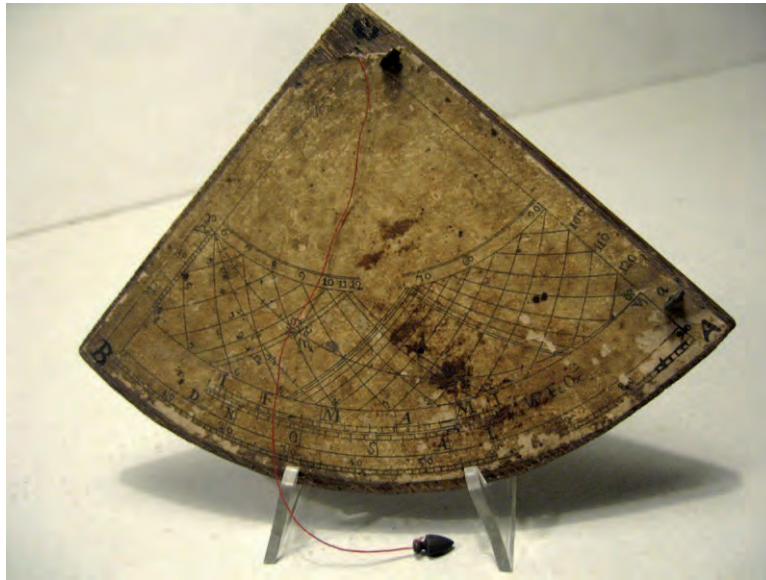


Fig. 1. Gunter Quadrant, printed on paper from an engraved plate, mounted on wood. Signed 'I P Fe. Ox.' The surface has been protected by a layer of varnish, now worn in a number of places. Glued to the reverse are manuscript instructions for using the instrument to measure the angular altitude of a hill, or the height of a steeple – they are of a later date, and in the same hand and black ink that has added the letters 'A' and 'B' to the fact of the quadrant. Reproduced by kind permission of Alpha et Omega, Milan.

helix. Given that this sheet bears the signature: 'Singleton Heardson', 'S', and 'Singleton' these drawings may not be the work of a Newdigate.¹⁶

Prujean H is the instruction for the use of the paper planispheric nocturnal and analemma attributed to Prujean, from the Newdigate collection formerly on loan to the Museum of the History of Science in Oxford, but returned to Arbury Hall in 1993, and illustrated as fig. 2 of the original article. Though neither Prujean H nor Prujean I carry his name, there can be little doubt that they are from the range of instruction sheets printed in Oxford and issued to explain the instruments he sold. Prujean I would have been supplied with sets of Napier's calculating rods, item 11 in his catalogue.

Prujean was by no means original in supplying relatively cheap paper instruments, printed from an engraved plate and intended to be mounted on wood or board. It had been a practice long followed in London where he had learnt his trade.¹⁷ It was a logical extension to provide a sheet of instructions, ideal for the relatively impecunious student or any other customer wanting to have an *aide memoire* on the use of the device. Alas, unlike brass and wooden instruments and bound volumes of books, individual bits of paper – even those mounted on board or wood, have a particularly poor survival rate. Only three surviving brass examples of the popular Gunter Quadrant, made by Prujean were noted – (item 5 in his 1701 catalogue,

¹⁶ WCRO, CR136/D1/75; A.R. Maddison (ed.), *Lincolnshire Pedigrees*, vol. 20 (1908), p. 479, within the entry for Heardson of Claythorpe, lists a Singleton Heardson junior vicar (of Lincoln Cathedral?) 1686. <http://archiver.rootsweb.ancestry.com/th/read/ENG-LINCSEGEN/2000-11/0973270125> notes a marriage bond of 1685 between Elizabeth Green and Singleton Heardson at Hemswell (Lincs). Neither Foster, *Alumni Oxonienses*, nor J. Venn, *Alumni Cantabrigienses . . . to 1751* (1922) record such a name as matriculating at either Oxford or Cambridge. Neither does he appear in www.theclergydatabase.org.uk.

¹⁷ D.J. Bryden, 'The Instrument-Maker and the Printer: Paper Instruments Made in Seventeenth Century London', *Bulletin of the Scientific Instrument Society*, 55 (1997), pp. 3–15.



Fig. 2. Detail of signature. Reproduced by kind permission of Alpha et Omega, Milan.

the use described in Prujean E) – that number can now be more than doubled.¹⁸ In addition there is a Oughtred-type brass double horizontal dial (item 4 in his 1701 catalogue), where the badly worn engraving includes the signature ‘J.P.’ with the calligraphic style of the ‘J’ similar to that of the signatures on the paper quadrants now at Arbury Hall, and illustrated in figure 1 of the original paper.¹⁹ However, only a single additional paper instrument by Prujean has been noted (Fig. 1).²⁰ It is the basic Gunter design of 1624, but less finely divided and smaller than the example illustrated in 1993 as fig. 1 (top), which has a Delamain Horizontal Quadrant in the top corner.

D.J. BRYDEN

¹⁸ Bryden, ‘Made in Oxford’, p. 271; to footnote 37 may be added: Gunter Quadrant with unequal hour quadrant within the shadow square, reverse unrecorded, from a private French collection, illustrated in S. Guye and H. Michel, *Time and Space: Measuring Instruments from the 15th to the 19th Century* (1971), p. 235, signed: ‘Iohñ Prujean Fecit | Oxon’; Gunter Quadrant with planispheric nocturnal and analemma on the reverse, Adler Planetarium Chicago, A.203, signed: ‘Iohñ. Prujean Fecit Oxon.’; Gunter Quadrant with unequal hour quadrant within the shadow square and planispheric nocturnal and analemma on the reverse, Sotheby & Co., *Sale of Clocks and Scientific Instruments* 15 vi 2004, lot 45, signed: ‘I.P.Fecit Oxon’; Gunter Quadrant, reverse with shadow square and zodiacal calendar, from the collection of Raymond J. and Laura Wielgus. see H. Nader, *Rethinking the World; Discovery and Science in the Renaissance* [Catalogue of an exhibition at the Lilly Library, Indiana University] (1992), exhibit 79, signed: ‘John Prujean Fecit Oxon’ – see <http://www.indiana.edu/~liblilly/etexts/rethinking/index.shtml#RE02041> – accessed Sept. 2016

¹⁹ Beamish Museum, Co. Durham – described and illustrated in J. Davis and M. Lowne, *The Double Horizontal Dial*, British Sundial Society Monograph, 5 (2009), pp. 149–150, 164.

²⁰ <http://www.fleaglass.com/ads/a-rare-john-prujean-quadrant-c-1670/>, accessed Aug. 2015.