

John A. Robey

## The origin of the English lantern clock. Part 2: The earliest lantern clocks

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Volume 38, No. 1 (March 2017) contains, apart from the regular sections Horological News, Book Reviews, AHS Programme, AHS News, Letters to the Editor and Further Reading, the following articles

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Front cover: Enamelled dial showing the times of sunrise throughout the year designed by Charles Clay with central gold disc with hand representing the face of the sun. 10.5 cms diameter. The clock is the subject of the article by Tessa Murdoch in this issue. Photo courtesy of Dreweatts 1759 Bloomsbury Auctions.

# The origin of the English lantern clock

## Part 2: The earliest lantern clocks

John A. Robey

*The second part of this article looks at the observation that the lantern clock appeared fully formed with no surviving prototypes. Possible transitional clocks are considered, but none can be regarded as a precursor to the English lantern clock. Continental clocks that influenced the design of the lantern clocks are also considered and some of the factors that led to the design of this specifically English clock are discussed. It is suggested that a major factor was the ease of working brass castings compared to the skills needed to forge iron wheels and frames.*

### Possible transitional and prototype lantern clocks made in England

To confirm or refute the observation that ‘the lantern clock has no ancestry but appeared fully matured’, examples of domestic clocks likely to have been made in Britain before about 1600 need to be considered. This section also includes some that have been proposed as transitional or prototype lantern clocks, but are almost certainly either of Continental origin, or are later than the earliest English clocks, in order to eliminate them from the discussion.

The small iron clock made by James Porrvis in 1567 for John Webbe of Salisbury has claims to be the earliest surviving domestic clock made in England.<sup>28</sup> It has some features that were used later on lantern clocks, such as a brass dial with the hand arbor pivoted between the front movement bar and the dial. Some components that are now missing, such as side doors, back plate, hoop and spikes and an alarm, can be deduced to have been similar to later English clocks. However, this clock is largely based on Flemish Gothic clock design with transverse wheels and it did not have a significant influence on the development of the lantern clock.

Before the final decades of the sixteenth century most domestic clocks in Britain were either imported or the work of immigrant craftsmen,<sup>29</sup> one of whom was Francis Nowe



Fig. 12. Weight-driven clock signed ‘francoy Nowe fecit a London A.o Dmo: 1588’. Only the outer case, internal pillars, finials and feet are original. (© Victoria and Albert Museum, London)

28. John Robey & Leighton Gillibrand, ‘The Porrvis Clock — The Earliest Surviving Domestic Clock made in England’, *Antiquarian Horology*, 34/4, 503–18.

29. White, *English Lantern Clocks*, p. 45.



Fig. 13. The so-called 'Precursor clock' with square-section iron pillars, iron plates, lunar and astrological displays. (Brian Loomes)

(with several spelling variants) who came to London from Antwerp, reputedly by 1571, and lived at Blackfriars from about 1576.<sup>30</sup> In 1588 he made a weight-driven clock (Fig. 12) that has been claimed to be the earliest surviving lantern clock made in England. Unfortunately the bell, bell strap, chapter ring, astronomical



Fig. 14. The movement from the rear showing the strike-work pivoted in brackets on the pillars and the restored iron balance. (Brian Loomes)

dial and the whole of the movement of this widely illustrated clock are later replacements.<sup>31</sup> Its case, covered with exuberant Renaissance engraving, encloses the frame. Apart from the lack of winding holes in the dial to confirm that the original movement was weight driven, there is little of the original 1588 clock that survives — which is primarily the outer case, Doric pillars, finials and feet — that has any affinities with a lantern clock. While there are some stylistic similarities there is not sufficient evidence to regard it as a prototype lantern clock.

What has been called the 'Precursor clock' (Figs 13–14) is something of an enigma.<sup>32</sup> It has brass finials and ball feet, but many of its

30. Brian Loomes, *Clockmakers of Britain 1286–1700* (Mayfield, 2014), p. 366. The authenticity of a lantern clock signed on the fret 'Francoy Nowe fecit' has not yet been confirmed.

31. Ernest L. Edwardes, *The Story of the Pendulum Clock* (Altrincham, 1971), pp. 164–6, plates 28–33; Dawson, Drover & Parkes, *Early English Clocks*, p. 17; White, *English Lantern Clocks*, pp. 47, 57, 58, 79.

32. Loomes, *Lantern Clocks*, pp. 41–4; Brian Loomes, 'A lantern prototype', *Clocks*, Vol 30, No 2 (February 2007), 9–14.



Fig. 15. Unusual brass lantern clock with naïvely engraved dial, sheet-brass frets and side covers, dated '-77'. (John Robey)

features, both stylistic and technical, are not typically English, with only a few that are. The square-section pillars, top and bottom plates, and the movement bars without cross arms are all of iron, the restored iron balance hangs from a cord,<sup>33</sup> the hand is fixed with the strike let-off from the going greatwheel and the iron bell strap that clips onto the top plate rather than the finials are all non-English features. This type of dial with an astrological display is not found on any known English weight-driven clock, despite it indicating times of high tide that correspond to London.

33. The evidence for the restored cord suspension may have been based solely on the absence of a bottom block for the verge.

34. The locking/countwheel detents rotate on the lifting/warning arbor. This is known on a French Gothic clock said to be about 1660–80, see René Schoppig, *L'horloge Française à poids* (Paris, 1984), pp. 83–6.

35. Anon, 'Were Gothic clocks ever made in England?', *Horological Journal*, 93/5 (May 1951), 331–2. This report of a meeting of the Antiquarian Section of the British Horological Institute (the fore-runner of the AHS) is full of misconceptions and inaccuracies; the first illustration shows an 'early Gothic clock' in the Ilbert Collection that is now known to be a fantasy fake made about 1910.



Fig. 16. English movement, but with the strike-work pivoted between angled and buttressed corner pillars. (John Robey)

There is a hoop for hanging, the brass wheels are very similar to those of lantern clocks and there is warned striking, although the two-part concentric arbor is of a different construction from the two separate arbors of English clocks.<sup>34</sup> Was it made on the near Continent, possibly for an English customer who wanted this type of dial but could not obtain it from one of London's makers of lantern clocks? However, a mid-twentieth century illustration of this clock shows it with English armorial frets of the 1640s.<sup>35</sup> These have since been removed and the screw holes filled, either because the frets were thought not to be original or they appeared to show that the clock was not as early as supposed. It is likely to be later than the first lantern clocks and cannot be considered as a prototype.

The clock in Figs 15–16 has many features



Fig. 17. Unsigned iron lantern clock with a separate iron chapter ring, probably English. (John Hooper)

found on lantern clocks.<sup>36</sup> There is a separate brass chapter ring with a large alarm disc that almost fills the centre. The alarm mechanism, presumably on the missing rear cover, was removed when it was converted to anchor escapement and the hand riveted to the alarm disc.<sup>37</sup> There are brass frets made from thin sheet rather than castings, the front one having simple naïve floral engraving, similar to that on the dial, and non-opening side panels fixed with taper pins, again with naïve engraving. The brass wheels, clicks and winding pulleys, hammer and spring are all similar to those on lantern clocks, the most notable difference

36. Loomes, *Lantern Clocks*, pp. 12–15.

37. Not repaired as stated in Loomes, *Lantern Clocks*, p. 15.

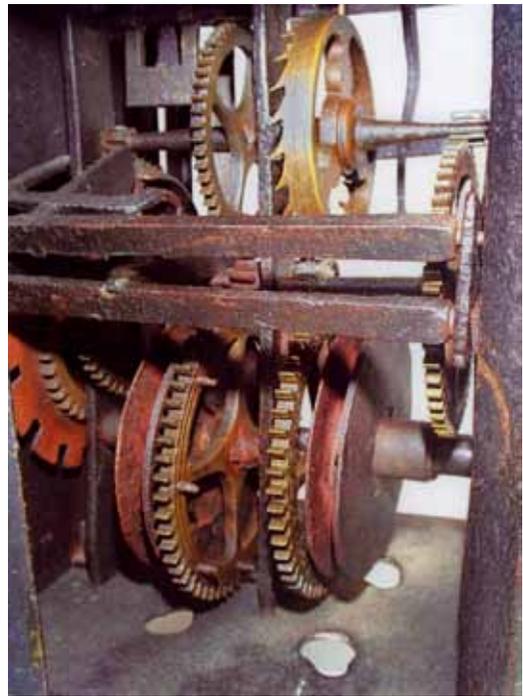


Fig. 18. The movement has brass wheels but with English-style cruciform movement bars of iron. (John Hooper)



Fig. 19. Original iron balance with eight brass quatrefoils. (John Hooper)

being the arbors of the strike-work which pivot between the corner pillar rather than in horizontal extensions of the movement bars. Brass angled buttress pillars with integral finials are held to iron plates by screws at the top and screwed nuts at the bottom with later separate iron supports for the bell riveted to the top plate. The fret bears a date and although

it has been almost obliterated by over-polishing ‘-77’ is faintly discernible. Above is a small face reminiscent of those sometimes seen on lantern clocks of the 1630s. It has been claimed, based purely on photographic evidence, that the date is 1577, but examination by the author reveals that the first two digits cannot be determined. It is more likely that, despite its early style of chapter ring and alarm disc, this clock dates from 1677 and was made by a rural English maker in a long out-of-date and naïve style. It appears to be an example of the group of clocks discussed below, but with its Gothic pillars and movement bars made of brass instead of iron.

The clock in Figs 17–19 is probably the earliest in a series of unsigned clocks with its plates, angled buttress pillars and cruciform movement bars all made of iron, but with brass wheels, that appear to be of English manufacture.<sup>38</sup> Later clocks of this type have engraved dials as well as English heraldic or dolphin frets and date to the mid seventeenth century or after. They appear to have been made in parallel with conventional lantern clocks, but whether they were made by immigrant clockmakers used to working in iron or using iron frames and movement bars (perhaps imported) as a cheaper alternative to cast brass parts is not known. There are no empty holes in the pillars for the strike-work and hammer arbors, so they are unlikely to be reused Gothic frames as has been suggested.

They were certainly not very popular and are not commonly found. The most important question is: was the clock in Fig. 17 a prototype lantern clock or was it the first of a type that moved closer to the standard design, but never made the complete transition? With a separate chapter ring (most Continental iron clocks have a one-piece dial), evidence for frets (now missing), side doors with pin hinges, brass

wheels and an original iron single-spoked balance supported at the lower end of the verge and not hung from a cord, there is little doubt about its English origins.<sup>39</sup> It is early, but just how early is only speculation and it cannot be stated with confidence to predate the earliest known conventional lantern clocks.

A clock dated 1610 and signed ‘Jhone Smyt in Lynce [King’s Lynn] wyt my hand’ is in an elaborate Renaissance-style engraved brass case (Figs 20–21).<sup>40</sup> He was possibly the same man as Jean Shmith or John Smith who was one of the original petitioners for the Clockmakers’ Company in 1622 and served variously as Assistant, Warden and Master until his death in 1651.<sup>41</sup> While this clock has some features of English lantern clocks, it is of Flemish appearance and construction, including a central countwheel. Though it was the work of a clockmaker living in England the elaborate case at least is likely to have been made abroad by a specialist, and it did not influence the design of the lantern clock, either as a prototype or subsequently.

A very large chiming clock, claimed to be late Elizabethan and made in England, has unfortunately lost its dial.<sup>42</sup> While it has its corner pillars — albeit of square cross-section and with Corinthian capitals — finials, feet, wheels and the rear movement bar all made of brass, the top and bottom plates, at least two of the other movement bars, the supports for both the hour bell and the chiming bells as well as other parts, are made of iron. While superficially it looks similar to an English clock there are many features that do not appear on any known examples of the period and it is more likely to have been made in the Netherlands or Flanders. A very similar large chiming clock with an unsigned dial has brass wheels but appears to have iron plates and pillars.<sup>43</sup> It is likewise probably of Flemish

38. John A. Robey, ‘English Lantern Clocks with Iron Frames’, *Antiquarian Horology*, 32/ 5 (March 2011), 689–704.

39. A clock with an identical frame and movement, was certainly in England about 1710, where it had probably been made, when it was converted to anchor escapement and fitted with a new brass dial. Robey, ‘English Lantern Clocks with Iron Frames’, 692–6, Figs 4–12.

40. Loomes, *Lantern Clocks*, pp. 17–19.

41. Brian Loomes, *Clockmakers of Britain 1286–1700* (Mayfield, 2014), pp. 442–3.

42. White, *English Lantern Clocks*, pp. 9, 96–7.

43. White, *English Lantern Clocks*, p. 96.



Fig. 20. A very elaborate weight-driven clock with bras corner pillars, feet, finials, bell frame and a separate chapter ring. (© Christie's Images Ltd)

origin rather than London-made. The very early dates attributed to these two clocks are based on opinion not firm evidence and they could be later. While both may have influenced the first makers of lantern clocks they cannot be regarded as their predecessors.

A musical clock made in 1598 by Nicholas Vallin (Figs 22–23),<sup>44</sup> who had moved from Flanders to London some eighteen years earlier, is often cited as the earliest lantern



Fig. 21. The partially re-trained iron movement has spiked rope pulleys and a countwheel between two central movement bars. (© Christie's Images Ltd)

clock. Its turned pillars with Doric capitals and finials give it a passing resemblance to a lantern clock, but the pillars, open top and bottom plates, movement bars and wheels are all made of iron, there are transverse trains and it has a carillon — none of which are found on early lantern clocks. It has more in common with a Flemish chamber clock than an English lantern clock.

A clock that was once regarded as a transitional English lantern clock is now largely discredited (Fig 24).<sup>45</sup> It has lantern-type finials and top and bottom plates with Gothic corner pillars, but the brass dial, bell,

44. British Museum Inv 1958, 1006.2039. [Jeff Darken], 'Picture Gallery: An Iron Chamber Clock by Nicholas Vallin 1598', *Antiquarian Horology*, Vol 30, No 5, 695–703.

45. British Museum, Inv 1958, 1006.2096. R. W. Symonds, *A History of English Clocks* (1947) plates 16–17; Jagger, *World's Great Clocks*, p. 99; Dawson, Drover & Parkes *Early English Clocks*, pp. 56–7.



Fig. 22. Carillon clock signed 'N. Vallin 1598' with a brass dial and finials, silvered chapter ring and iron pillars. (© Trustees of the British Museum)

bell strap and English style of balance were added in the twentieth century. The surviving components that are original indicate that it was probably made in The Netherlands, Flanders or France in the mid-seventeenth century.

In summary, none of the clocks claimed to be English prototypes of the lantern clock can, with any confidence, be regarded as being either earlier than the first lantern clocks or made in Britain.

Fig. 24. Weight-driven clock once thought to have been a transitional lantern clock, but probably made on the Continent. The brass dial, bell, bell strap and balance escapement are later. (© Trustees of the British Museum)

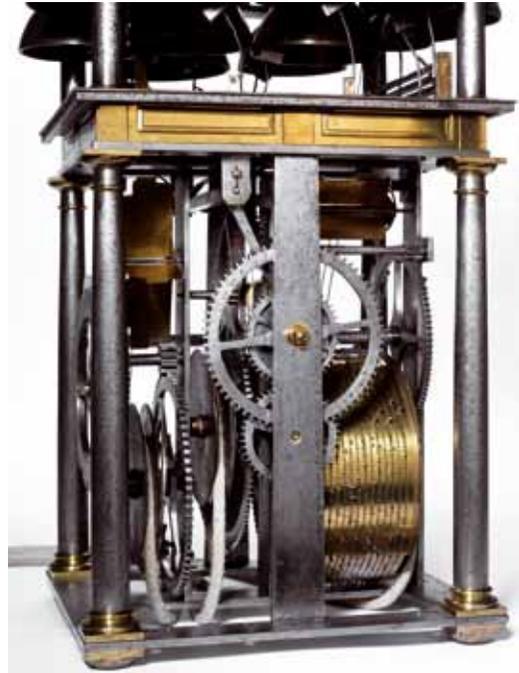


Fig. 23. Movement of the Vallin clock showing the transverse trains with the frame, movement bars and wheels made of iron. (© Trustees of the British Museum)





Figs 25a-c. A small weight-driven wall timepiece with alarm from the Low Countries, dated 1575. The wheels and movement bars are of brass. Alarm-setting hand and unlocking lever missing. (Museum van het Nederlandse Uurwerk, Zaandam)

### Continental influences on the lantern clock

This section includes clocks made in Continental Europe that may have influenced the design of the earliest English lantern clocks. This will help to establish whether it was a fundamentally new design or an amalgam of technical and stylistic features from established clockmaking traditions.

The small weight-driven timepiece shown in Fig. 25, dated 1575, is reputed to have belonged to the Mayor of Leiden, the city's university having been founded in that year. It has many stylistic similarities to the much more complex Vallin musical clock: the turned iron pillars, the triangular pediments and the brass dial with a separate chapter ring. It is a timepiece and alarm and has opening side doors, which are made of brass, as are the top and bottom plates, wheels, movement bars and a hoop for hanging on a wall. Since there is no striking train the technicalities of this cannot be compared with lantern clocks, but there are some stylistic features in common.

The small weight-driven Renaissance wall clock in Figs 26–27 has some of the visual attributes of the lantern clock: turned pillars, finials, feet, bell strap (though all of iron), a brass dial with separate chapter ring, brass

front and side frets and brass doors as well as hoop and spikes. However, the movement has an iron frame and wheels with a vertical hammer shaft, more typical of Continental work. This clock is typical of a number of Flemish and German examples that have some resemblance to lantern clocks. They are generally smaller than lantern clocks, they can be with or without pillars, finials, feet and a bell frame and have relatively simple iron posted-frame movements, either spring or weight driven, the German ones at least having nag's head striking.<sup>46</sup> Significantly the Germanic examples have an 'outer case' with secondary outer top and bottom horizontal plates of thinner brass which hold the doors and dial plate. This also seems to be typical of earlier Renaissance Flemish clocks and this type of construction was widely used later in rural Dutch clocks, such as Zaandam and Frisian *stoel-* and *staartklokken*. The English lantern clock disposed of these top and bottom covers and has just two horizontal plates to hold the movement bars, the doors, the dial and back plate.

### The English lantern clock — its *raison d'être*

Why did the newly emerging English clockmaking industry turn its back on

46. Klaus Maurice, *Die deutsche Räderuhr* (Munich, 1976), Vol II, Figs 91–103.



Fig. 26. A fine late seventeenth-century wall clock, probably Flemish, with brass dial, frets and side doors. The pillars, finials and feet are of iron. (© Auktionen Dr Crott)

traditions developed over several centuries in Continental Europe? By the end of the reign of Queen Elizabeth I, Britain, and especially England, had gained a new optimism, identity and increasing prosperity. By the time of her death in 1603 clockmakers realised that there was the potential for a uniquely British type of domestic clock that would have widespread appeal among a rising middle class of prosperous merchants, lawyers and the like. The very wealthy and the nobility might still prefer elaborate and complex gilt Renaissance clocks



Fig. 27. The frame and wheels of the movement are iron with a vertical hammer shaft. (© Auktionen Dr Crott)

of the sort made in Augsburg in southern Germany, but underneath their elaborate exteriors instead of carefully filed movements with brass wheels and plates there were complex posted-frame mechanisms made almost entirely of iron (Figs 28–29). The simpler Gothic clock was old fashioned and its iron construction with a painted dial did not appeal to the British market. Not only were they regarded as having a complicated method of construction, they were considered to be unreliable, as evidenced by William Shakespeare, who disparagingly speaks of:

A woman, that is like a German clock,  
Still a-repairing, ever out of frame,  
And never going aright, being a watch,  
But being watch'd that it may still go  
right!<sup>47</sup>

47. William Shakespeare, *Love's Labour's Lost*, (1594–5), 3.1.183–6.



Fig. 28. A complex spring-driven gilt-brass German 'masterpiece' table clock dated 1554. (Dreweatts 1759 Bloomsbury Auctions)

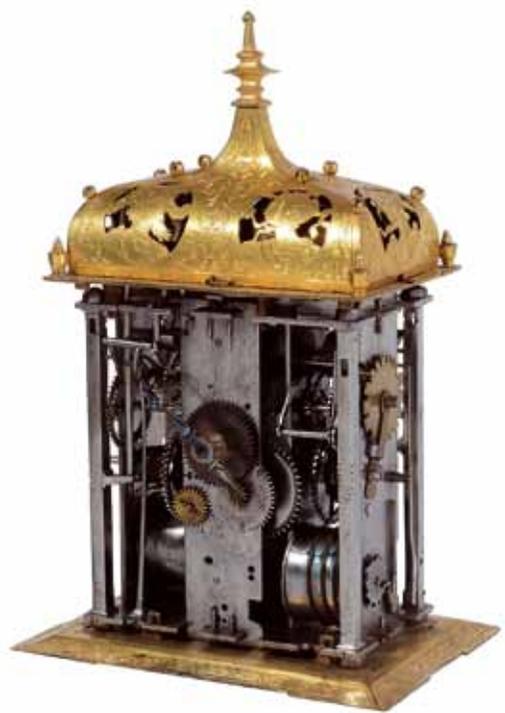


Fig. 29. The quarter-striking posted-frame movement is made almost entirely of iron. (Dreweatts 1759 Bloomsbury Auctions)

What was needed was an attractive modern design that was of relatively simple construction, reliable, devoid of unnecessary features such as lunar displays, automata or carillons, and was easy to make by clockmakers with little expertise in forging iron. Just as importantly it had to be easy to adjust and maintain by the owner without regular recourse to a trained clockmaker. The frames and wheels of Gothic and Renaissance clocks needed a far greater level of skill in the art of forging small iron components than could be achieved by the average blacksmith. The pillars, sub-frames and movement bars needed forging and filing to a high degree of accuracy so that they fitted together squarely and rigidly. Wheels had to be forged from two rectangular bars: one being slit by a chisel at each end and opened out to produce the crossings, while the other was forged and fire



Fig. 30. 'The Clockmaker' by Jost Amman (1568) showing a Gothic clock and another in the course of construction. An assistant hammers an iron plate on an anvil with a forge at the rear.



Fig. 31. Engraving of a clockmaker's workshop, by Joan Stradanus, about 1590, dominated by a large forge. The foliot, intended for a turret clock, is fitted upside down.

welded into a flat circular rim. These then had to be joined to produce a wheel that was concentric and ran without wobble when mounted on an arbor. Countwheels, with their offset crossings and internal teeth, required even greater skill to make.

It is clear from contemporary illustrations of the workshops of European clockmakers that they could be a hive of activity. The well-known woodcut by Jost Amman published in 1568<sup>48</sup> shows a clockmaker talking to a customer while an assistant hammers away at an anvil with a blazing forge behind him (Fig. 30). Interestingly, the Gothic clock on the bench depicts what might be a foliot, though it could not possibly work as shown, while a notched bar, which might also be a foliot, lies alongside. This book illustrates

trades carried out in Nuremberg, where the foliot was not normally used for domestic clocks. The copperplate engraving of about 1590 signed by Joan Stradanus<sup>49</sup> entitled *Horologia Ferrea* (Iron Clocks) shows no less than eight workers (Fig. 31). Again there is a large foliot that is probably for a turret clock. The rear of the workshop is dominated by a large forge with one man working the bellows and another heating an iron bar ready to forge it on an anvil in the centre of the room. The significance of these two illustrations is that a forge and several workers were often employed in making an iron clock.

Replacing iron wherever possible by brass castings provided many advantages for London clockmakers fabricating the newly-devised lantern clocks. Once the patterns had

48. Hans Sachs, *Das Ständebuch* (The Book of Trades), (Frankfurt am Main, 1568). Available online at <http://www.vam.ac.uk/content/articles/t/the-book-of-trades-das-standebuch/>.

49. Also known as Giovanni Stradano, Jan Van der Straet or Stratesis (1523–1605), he was a Flanders-born artist active mainly in sixteenth-century Florence.

been made components could be readily duplicated by brass founders, many of whom worked in Lothbury, which became the location of a number of prolific makers of lantern clocks in the City of London. This removed the necessity for a large forge and an assistant to work it. Many of the operations required to make an iron clock needed an extra pair of hands to hold the red-hot iron in tongs and a swage or other forming tool, while another person wielded the hammer. This means that a maker of brass clocks could, if desired, work alone in a small workshop. Making both iron and brass clocks needed similar knowledge and expertise in filing wheel teeth and pinion leaves, turning pivots and making escapements, but working in brass required only filing and turning, not blacksmithing skills.

In addition the reduced friction and wear produced by the contact of dissimilar metals (brass wheels and iron pinions) was a significant practical advantage. By 1675 the experience gained from running lantern clocks for two or three generations had convinced English clockmakers of its benefits,<sup>50</sup> but if this effect was appreciated by the first makers of lantern clocks working at the start of the seventeenth century is not clear. It was more likely to be a retrospective advance in the understanding of the practical use of metals in clockwork as a result of experiences gained from the long-term running of lantern clocks. In the author's opinion this was another factor that encouraged the change to brass wheels, with the primary one being ease of construction. Iron wheels had performed well enough for a couple of centuries before the lantern clock and continued to do so until the middle of the eighteenth century on some rural German clocks. The move to brass wheels was an improvement, not a fundamental change.

These constructional and technical advantages must have outweighed the fact that at this period virtually all the brass used in

Britain had to be imported from an area in the Low Countries close to the present-day junction of Belgium, the Netherlands and Germany.<sup>51</sup> In any event wrought iron suitable for making clock wheels had to be of high purity to prevent slag inclusions causing teeth to break off. At this period English iron was not highly regarded and for quality work it was imported from Sweden, as testified by the Swedish forge marks found on some early English turret clocks.

Instead of looking towards the Gothic clock, London's clockmakers based their designs on the weight-driven Renaissance clocks being produced in Flanders. Externally they were a simplified all-brass version of clocks similar to Fig. 26, but the all-iron movements were abandoned in favour of brass, which was becoming more widely used, especially in the Low Countries (e.g. Fig. 25). By restricting decoration to the finials, feet, frets and dial meant that the only other tradesmen involved were brass- and bell-founders and engravers. Most of the visible parts of the more elaborate Renaissance clocks were made by specialist case-makers, chasers, goldsmiths and gilders, which added considerably to the costs.

Another factor in adopting the new simple movement design may have been that English clockmakers were not restricted by a guild system that insisted on apprentices producing a complex 'masterpiece' clock (Figs 28–29). This resulted in apprentices in Germany making only the type of clocks specified by the guild's rules — the five choices for a masterpiece in Augsburg in 1577 were still being insisted on as late as 1732 when they were antiquated and unsaleable.<sup>52</sup> While this maintained the high standards of the craft and protected copying by non-members, it positively discouraged technical innovation. When, several decades later, the Clockmakers' Company was established in London, making a masterpiece was not a requirement.

50. J. S. [John Smith], *Horological Dialogues* (1675), pp. 12–14.

51. While there were a number of attempts to make brass in England in the sixteenth and seventeenth centuries, they were all either experimental, poor quality or small-scale operations, and commercial production of English brass did not take place until about 1720. Information from Dr Joan Day, Bristol.

52. Eva Groiss, 'The Augsburg Clockmakers' Craft' in Klaus Maurice & Otto Mayr (editors), *The Clockwork Universe, German Clocks and Automata 1550–1650* (New York, 1980), pp. 57–86; also pp. 172–3.

Not only were the new lantern clocks easier and quicker to make than Gothic clocks, they were much more pleasing to the eye and London's fledgling clockmaking industry soon found a ready market for its wares. With an engraved dial, silvered chapter ring, turned pillars, feet and finials, a brass bell strap, and employing the latest technology such as warned striking, a moveable hand, an alarm-setting disc and iron pivots running in brass bearings, lantern clocks became the 'must-have' item of the era.

A distinctive characteristic of English lantern clocks is the cruciform front and rear movement bars that carry the hammer and strike-work arbors at the extremities of their arms (Fig. 33). These are a direct consequence of the new design of frame and its side doors. Gothic clocks do not normally have doors,<sup>53</sup> though they are present on Renaissance clocks. On these Continental clocks the strike-work and hammer arbors pivot in the corner pillars, while the doors sit outside the pillars and are usually hinged to the outer case. In contrast the doors of lantern clocks have pin hinges that pivot in and sit between the top and bottom movement plates. The pivot holes for these hinges have to be set forward of the square pillar bosses, hence, when the closely-fitting doors are opened the rear vertical edges swing inwards. Pivoting the arbors of the strike-work in the pillars in the Continental manner would prevent the doors from opening.

The solution was to locate these arbors in the now familiar cross arms. These became an enduring identifying feature of virtually all English posted-frame movements from the early seventeenth century into the nineteenth century, even on thirty-hour longcase clocks which do not have side doors. French lantern clocks usually have the arbors pivoted in the pillars using a screw-in pivot at the rear and often there are no doors. Cross bars and doors are found on some French lantern clocks, particularly those emulating English style,



Fig. 32. Lantern clock signed 'Robertus Harue London fecit' with a gadroon pattern in the dial centre and original frets. Robert Harvey died in 1615. (Brian Loomes)

and on some French thirty-hour clocks, but they are not the norm.<sup>54</sup> Other details that appears to have originated on lantern clocks

53. There are the inevitable exceptions (usually French or Flemish): a Gothic clock, made in 1596 by Mahiev of Coigny, Normandy, has painted iron doors with separate hinges. Offered at Christie's, King Street, London, 15 September 2009. See also Fig. 6, Part 1.

54. There is evidence for English-style doors (now missing) on an early eighteenth-century French lantern clock with the strike-work arbors pivoted in the pillars. But the iron pillars are very slender with small capitals so the problem is not as acute as with an English lantern clock. See: John A. Robey, 'French Lantern Clock with Rack Striking', *Horological Journal*, Vol 158, No 5 (May 2016), 222–8.



Fig. 33. Rear of the movement with the countwheel removed showing brass wheels and the hammer and strike-work pivoted in typically English brass cruciform movement bars. (Brian Loomes)



Fig. 34. Movement showing the English style of hammer spring and L-shaped stop. (Brian Loomes)

are the strong vertical hammer spring fixed to the bottom plate and a sturdy L-shaped stop or counter fixed below the top plate (Fig. 34).

Setting the fixed single hour hand of a Gothic clock to time was a cumbersome process involving lifting the pallets out of engagement with the crownwheel — this being necessitated by the strike let-off being by a pin on the going greatwheel. The decorative frets and side doors of a lantern clock made this impractical, so a twelve-pointed starwheel or ratch fixed to the hand arbor facilitated easy adjustment. In addition the light balance enabled the inconvenient cord suspension and gallews to be dispensed with.

Another technical feature of English lantern clocks is that they always employ warned striking, which was used on virtually all subsequent striking clocks made in Britain. Locking is on a hoop wheel, but why was this used when, as other clockmakers realised, locking on a pin was simpler? Warned striking

with pin locking was used from at least 1607 on the turret clocks made by Leonard Tennant of London and his apprentices, so why did the first makers of lantern clocks not follow suit? Perhaps they were influenced by Flemish clocks, where one of the methods of providing overlift with nag's head striking was by means of a hoop wheel. However, this was by no means universal and some Flemish/French clocks are known with overlift initiated by the hammer pins.

Lantern clocks were virtually the only type made in Britain until the 1660s and they proved to be so successful that they endured for over a century and a half, unaltered in principle, apart from taking advantage of the new short pendulum with a verge escapement, and then the long pendulum with an anchor escapement. There were, of course, gradual stylistic changes to the engraving, the dial, finials and frets, together with regional variations, but the English lantern clock

retained its original form until its final demise in the second half of the eighteenth century, although it had started to fall out of fashion by the early years of that century. While the English abandoned lantern clocks in favour of longcase and other clocks the concept continued elsewhere, especially in France and Italy.

### The first makers of lantern clocks

British clocks, even those made in small rural villages, are regularly signed with the maker's name and place of work, more so than Continental clocks. The latter are often not signed outside the main clockmaking centres and the makers of rural clocks remain largely unknown. This puts British clocks at a great advantage for historians, but before this was a requirement of the Clockmakers' Company (and later embodied in law) many early English lantern clocks were not signed (e.g. Fig. 10, Part 1). Some of these may well be the earliest surviving lantern clocks, but there is little evidence, as dating by stylistic features alone is not an exact science.

Hence, reliance has to be placed on clocks signed by makers whose date of death are known. The earliest such maker is Robert Harvey by whom a wall timepiece alarm and two lantern clocks are currently known, signed variously 'Robertus Haruie fecit', 'Robertus Harue Littell Brittain London fecit' and 'Robertus Harue London fecit' (Figs 32–34). He was formerly thought to be the man of this name working in Oxford, but it is now known that he was born in London between 1580 and 1583, son of clockmaker John Harvey, and was working on church clocks from 1602. In 1592, when he was only 9–12 years old, he was left £5 by the London clockmaker Peter Medcalfe (who had been his father's master), being 'a boy which I keep'. At this age he would have been too young for a formal apprenticeship with Medcalfe, but would have been involved with clocks from an early age. It is not known with whom he completed his training but he

was free of the Clothworkers' Company in 1604, by the membership rights of his father, who had died in 1602.<sup>55</sup> Peter Medcalfe was the earliest of a long line of clockmakers who were members of the Clothworkers' Company, many of whom became prominent makers of lantern clocks.

Robert Harvey died about May or June 1615, aged only 32–35, which gives a terminal date for his clocks. It cannot be stated with certainty that Robert Harvey was the 'inventor' of the English lantern clock, as some of the unsigned clocks that appear to be very early may predate Harvey's. Since he is unlikely to have been signing his work before 1604, it can be confidently said that the lantern clock came into existence sometime during the following decade, if not earlier.

No clocks are known signed by either Robert's father, John Harvey (who at the relevant period was heavily involved as the 'ingener' of an organ clock made for the Sultan of Turkey as a gift from Queen Elizabeth I) nor Peter Medcalfe, though they might have had some influence on their development. But can any of the other known makers of early lantern clocks also be considered?

The most serious other contender is Henry Stevens, who is estimated to have been born about 1577, was apprenticed in 1591 to John Harvey, free in 1598 and died in 1638.<sup>56</sup> Three clocks by Stevens are known, one dated 1620 being the earliest reliably dated English lantern clock,<sup>57</sup> and since he was a few years older than Robert Harvey it is quite possible, if not probable, that he made lantern clocks before Harvey. In any event, what was he doing in his early years — apart from mending church clocks — if he was not making lantern clocks? This issue will not be resolved until a clock by him is discovered bearing a very early date.

Other early makers of lantern clocks include Peter Closon, who was apprenticed to Henry Stevens, but not until 1608, William Bowyer (regarded as a maker of some of the finest lantern clocks of the highest

55. Loomes, *Clockmakers of Britain*, pp. 248, 343–4. This gives references to detailed articles in *Clocks*.

56. Loomes, *Clockmakers of Britain*, p. 457.

57. White, *English Lantern Clocks*, pp. 11, 98–100. A clock by John Holloway, Lavington, now in the Science Museum (Inv 1954-579), dated 1611 is a fabrication. A clock by William Payne, East Smithfield, said to be dated 1618, is probably after 1650, see H. Cescinsky & M. R. Webster, *English Domestic Clocks* (1913, reprinted 1976), p. 53.

workmanship) who was probably born in the early 1590s and took his first apprentice in 1616, while John Pennock was not apprenticed until 1620.<sup>58</sup> It is most unlikely that any of these early makers would have been making clocks before Robert Harvey or Henry Stevens.

## Conclusions

The often repeated claim that English lantern clocks were a development of European Gothic clocks has been shown not to be substantiated, but they did suddenly appear about the first decade of the seventeenth century in their fully developed form with no surviving precursors. The only subsequent evolution was the inevitable changes in escapement technology in order to improve timekeeping, as well as detailed stylistic changes. A similar situation had occurred in the mid-sixteenth century, when the surviving examples indicate a sudden appearance in southern Germany of complex astronomical table clocks in their fully developed form, with little trace of prolonged phases of development which must have taken place.<sup>59</sup> The emergence of the lantern clock appears to be a direct response to the growing stability and the subsequent demands of an increasingly affluent society, especially the rapidly expanding merchant

class in the towns and cities, particularly in London, towards the end of Queen Elizabeth I's 'Golden Age'. Instead of being based on iron Gothic clocks, English lantern clocks appear to be a reaction against them. London's clockmakers produced a simpler version of the Renaissance clocks being made on the near Continent, substituted their iron frames and wheels with brass and added innovations of their own. This was the start of Britain's eventual dominance of clockmaking that reached its zenith in the eighteenth century.

Until the emergence of a yet-to-be discovered prototype or an earlier dated clock, the earliest known signed lantern clocks are those made by Robert Harvey sometime between 1604 and 1615. Henry Stevens, who was apprenticed to Robert Harvey's father, is likely to have also been involved in their production.

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58. Loomes, *Clockmakers of Britain*, pp. 66, 125–6, 393–4.

59. Vehmeyer, *Clocks Their Origin and Development 1320–1880*, pp. 45, 84, based on Maurice, *Die deutsche Räderuhr*, p. 35.

## Addendum to Part 1

Since publication I have been informed by Klaus Hess, Switzerland, that the top cock of the French/Flemish Gothic clock in Figs 7-9 has been modified. The balance was probably suspended by a thread from a gallows, as was usual on these clocks, but this was later cut off and a brass block fixed to the central movement bar to support the bottom pivot. The present warned striking replaced the original nag's head, and while the iron dial

plate is probably original the brass chapter ring and the alarm disc as well as the alarm mechanism are later.<sup>60</sup> This emphasises the caution given in the early part of this article regarding the almost inevitable modifications and updates that have been made to early clocks. I am grateful to Herr Hess for the opportunity to correct the information. This does not affect the general conclusions.

60. Klaus Hess, 'Eine frühe Eisenuhr (Hausuhr) aus Flandern oder Burgund', *Chronométrophilie*, No 73, Summer 2013, 40–51.