

# Was there high-quality, wholesale movement manufacture in seventeenth-century London?

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*‘One can find common features on clocks by a variety of makers which must indicate that they came from the same source.’ This 1982 quotation, from the book *Early English Clocks*, relates to an intriguing series of clocks that Dawson, Drover and Parkes (DDP) identified. The broad proposition of this article is to take an impartial look at that statement and investigate the claim that there exists a series of clocks, signed by various makers, fitted with movements supplied by a single manufactory in the period 1660–1720. It is well accepted that, from the mid-eighteenth century, the practice of clock retailers sourcing whole movements from another supplier and simply signing the product was well established. The question begged by the DDP statement is simply: ‘was this practice already in place in the London clock-making industry during the second half of the seventeenth century?’.*

*The aim of this article is to introduce to AHS members a research project, funded by the Society, and being carried out by the author, to investigate this subject further. It is hoped that by looking impartially at available evidence, and also by attempting to gather further data from other clocks, it will be possible to make an informed judgement on the question.*

## Introduction

In much of the literature of Golden Age horology, there is a natural focus on ‘clockmakers’ rather than ‘clockmaking’. In 1982, Dawson, Drover and Parkes published their seminal work *Early English Clocks*, looking at seventeenth-century clockmaking in general. They made a number of comparisons between relevant clocks and their makers and highlighted some important connections.<sup>1</sup> Nearly four decades later it is time to revisit the topic, with the benefit of significant knowledge and experience gained in the intervening period.

This article draws heavily on information and opinions developed over those decades by two individuals in particular—a collector of seventeenth-century clocks, and a clockmaker who has spent fifty years at the bench. Much of

the clockmaker’s time has been spent on systematic research of the horological Golden Age with a large number of relevant clocks passing through his workshop. These two individuals have spent many years looking beyond the name under which a clock might be signed to isolate other identifying characteristics and, like DDP before them, they too have made some interesting observations. Broadly, they feel strongly that there is significant evidence in favour of the proposition (only lightly touched on in DDP) that high-quality clock mechanisms were produced anonymously in a particular ‘wholesale’ workshop with an identifiable ‘signature’. In proposing the existence of this workshop, they recognise that it is entirely possible that it may have been one among several other workshops producing movements

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1. Percy G. Dawson, C. B. Drover, D. W. Parkes, *Early English Clocks* (Antique Collectors’ Club, 1982), pp. 300–323 [hereinafter DDP].

for the trade. This project however concentrates on the possible existence of just one workshop for which a specific group of movement characteristics is repeatedly seen together in one type of movement. In other words, the proposition does not simply gather together known features of seventeenth-century clock movements. It presents a significant number of unique features, seen together and only in movements of this type, movements which are however signed by a variety of different 'makers'.

As stated, the principal aim of this project is to encourage a wider community of collectors and owners to examine relevant objects in their care, and where possible to share data. The project would benefit vastly from such crowdsourcing, and members are urged to take part in such a survey, by looking at any longcase or table clocks in their possession and considering if they might be relevant to the project. Once enough data is gathered and processed, a second stage to the project would be to publish the findings and, if possible, conclude whether such a workshop seems likely to have existed or not.

### The historical context

White notes that after the Civil War (until, say, 1660) the number of clockmakers trading in London was over forty.<sup>2</sup> Attempts have been made to estimate the volume of domestic clock production since its introduction in the seventeenth century. By looking at the inventories of those wealthy enough to be able to afford domestic clocks, Chris Williams was able to observe a significant increase in clock ownership from 8 per cent of those surveyed in 1650 to 50 per cent in 1700. He also calculated that Kentish clock makers needed to produce around eight clocks per year and make further income from repair work in order to earn a living wage.<sup>3</sup>

Extrapolating from a rough figure of, say, fifteen clocks each year on average from the Tompion manufactory, it is clear the total number for the trade must at least reach the high hundreds per annum. The numbers of survivors, coupled with the scant production records available, suggest that the number of clocks produced in England during the period 1660–1720 must have grown significantly, totalling perhaps tens of thousands of clocks. How then can we explain the mechanism by which the trade geared up its business to produce so many clocks, largely to a new design, over a relatively short time? Ironically, the domestic clock flourished at a time when the workforce was likely to have been depleted by the Plague, and certainly physical capacity lost a year later to the Great Fire. In the mid-1660s, the number of members of the Clockmakers Company rose to more than 160, but the Great Fire probably destroyed the premises of more than half of them.<sup>4</sup> External factors acted as a brake on capacity, alongside internal matters such as the strict limits on apprentice numbers notionally imposed by the Worshipful Company of Clockmakers (WCC). However, the economic benefit of luxury goods production was well-known. The Royal Society, set up in 1660, had a wider remit than just scientific investigation. Two committees were set up to continue Francis Bacon's work on the 'History of trades and mechanics' with the underlying intention of improving manufacture. Both produced reports on production linked to the luxury trades, including clocks. This led to an increased awareness of demand and retail opportunities. London's urban elite saw the Great Fire as an opportunity to improve the Capital, and hopes were high for a modern, more sophisticated city.<sup>5</sup> Post-Restoration momentum sustained production and demand during this difficult period.

2. George White, *The Clockmakers of London* (London: Worshipful Company of Clockmakers, 2018), p. 22 states that between 1647 and 1660, more than forty specialist clockmakers were operating in London, as well as numerous watchmakers.

3. Chris H. K. Williams, 'Seventeenth and eighteenth century clock demand. Production and survival. An economic and statistical analysis', *Antiquarian Horology* March 2005, 571–583.

4. White, *Clockmakers*, p. 30.

5. Linda Levy Peck, *Consuming Splendor: Society and Culture in Seventeenth-Century England* (Cambridge and New York: Cambridge University Press, 2005), p. 340.

Trading between professional guild members clearly took place in many trades, with comparable divisions between parts of a trade, such as retailers, wholesale suppliers, or individual pieceworkers. Looking at the apothecaries' trade, for example, a case brought before the Mayor of London's court in 1669 heard evidence on behalf of the defendant that it was common practice among the 'best and greatest of Druggists in London' to buy goods from one another to support the vast number and types of commodities they sold. The apothecary found himself in court following a complaint from an apprentice that, since his master bought in most of his stock, he was in no position to teach.<sup>6</sup> It is intriguing to speculate how often clockmaker apprentices were of the same view. Various clockmakers were known to voice their poor opinions of their fellows, and the minutes of the WCC offer evidence. Some historians now suggest that many who petitioned their respective courts were motivated by petty rivalry. Loomes suggests that Ahasuerus Fromanteel's problems with the WCC may have stemmed from resentment at his talents and independence.<sup>7</sup>

### Specialisation and trading between clockmakers

The first English domestic clocks were produced in the late sixteenth century, mostly in London.<sup>8</sup> As the trade developed in the early seventeenth century, the manufacture of components such as springs, pinions and bells (to name only a small selection of individual trades) required specialist production, both in terms of plant and equipment, and highly specific skills. In the lantern clock field, White, Robey and Loomes found evidence of the use of rough cast components, including various

cocks, pillars, frets and wheel blanks, and foundry casting marks on various components. Clockmakers (or perhaps finishers and/or retailers) outsourced components from specialists, some providing a pattern, others selecting from a catalogue of stock designs. Before the Great Fire, a number of foundries were based in Lothbury and then later in Moorfields.<sup>9</sup> Such founders had the opportunity to diversify from their staple output of 'candlesticks, chafing dishes, spice mortars' with the production of components for nearby clockmakers.<sup>10</sup> Some became members of both the Founders' Company and the Clockmakers' Company indicating that clockmaking componentry was a significant part of their business.<sup>11</sup> The practice of making clocks from brass continued and so did the use of specialist craftspeople. Forsyth notes that at the beginning of the seventeenth century jewellers began to specialize and furthermore that subdivisions appeared within specialisms, allowing individuals to become 'singular in their art'.<sup>12</sup> These artisans acquired semi-independent status and possibly worked across a number of locations as required. This practice may have also been applied to other trades, including clock and watch manufacture.

It is possible that London's clockmakers, in some cases friends as well as competitors, established other collaborative practices. The significant demand for London longcase and table clocks would have created an added burden on the capacity of workshops, coupled with demands for aftersales service from existing customers.<sup>13</sup> Entrepreneurs would benefit from a market exhibiting increased demand, and it is argued trade clock suppliers emerged, their products mediated to end

6. Hazel Forsyth, *Butcher, Baker, Candlestick Maker* (London: Tauris, 2016), p. 73.

7. Brian Loomes, *Clockmakers of Britain 1286–1700* (Mayfield, 2014), p. 207.

8. White, *Clockmakers*, pp. 12–13.

9. John Robey, 'Moorfields and Clock-Brass Founders', parts 1 and 2, *Antiquarian Horology* June and September 2012.

10. John Stow, *A Survey of the Cities of London and Westminster, Borough of Southwark, and Parts Adjacent* (London: Read, 1733), p. 25.

11. For example, Robert Neames. See Robey, 'Moorfields' (September 2012), 614.

12. Hazel Forsyth, *London's Lost Jewels: The Cheapside Hoard* (London: Philip Wilson, 2013), p. 80

13. C. Stuart Kelley, 'Henry Jones – Clockmaker of London', part IV, *Antiquarian Horology* June 2005, 721–743: pp. 721 and 728.

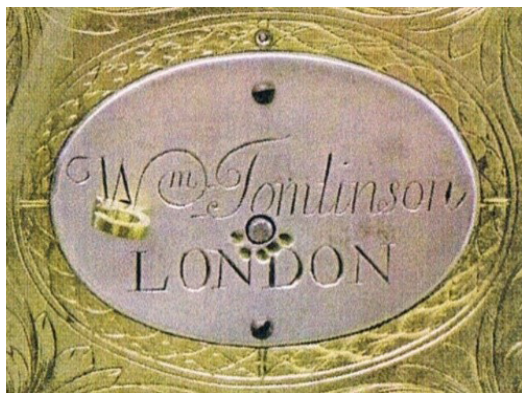


Fig. 1. Brass plaque, engraved 'Wm Tomlinson', on a movement believed to be from Daniel Quare's workshop, c. 1700-05. Image: Laurence Harvey.



Fig. 2. The signature 'Phillip Constantin, London', found below the engraved plaque on the movement in Fig. 1. Image: Laurence Harvey.

customers by distributors.<sup>14</sup> Many collaborations between workshops at this period are suspected, a number involving Daniel Quare for example who appears to have supplied finished clocks to a number of other makers.

### Outsourcing of movements and rebranding

Surviving evidence suggests there was a further complication in that examples of one maker's work were occasionally 'rebranded' and signed by another maker, sometimes when the clock was relatively new, again probably as a result of high demand.

Figs 1 and 2 show details from the back plate of a spring clock which can plausibly be identified as originating in the Quare workshop and which would appear to be an example of both outsourcing and then rebranding. It features a now-silvered brass plaque, fixed to the back plate, bearing the name Wm Tomlinson, and the dial is signed to match. The owner of the clock was curious to know if there might be another name beneath the plate and instructed a restorer to look. The plate was carefully removed, with the expectation of finding Quare's signature underneath. However, the original engraving, once revealed, showed the clock to be signed for Phill Constantin. Further examination of the dial-

plate revealed that it too seemed to have been altered. The name Constantin had been partially hammered out and then altered to match the name newly added to the reverse.

It is worth pointing out that it appears relatively common for movements to have had names changed, name plaques to have been added or changed, and signatures to have been beaten out. There are a host of reasons why a name might subsequently have been changed on a clock movement or dial, and such examples are largely unconnected with the subject of this thesis –primary movement supply.

Quare was highly unlikely to be alone in supplying clocks to competitors whose names would appear on the final item. Mutual business was to be had.

### Outsourcing in the watch trade

During the period in question, the outsourcing of movements and parts has long been accepted as standard practice in the watch trade. For example, Neale<sup>15</sup> cites Benjamin Gray's recorded sales to Quare and Windmills in Gray's day book:

1707 June 27 Delivered a repeating quarter motion with the two springs and the bell to Mr Windmills. £11-14-0.

Although Neale did not actually recognise it,

14. Society offered increasing demand. C. Stuart Kelley, 'Henry Jones', p. 734.

15. J. A. Neale, 'Joseph and Thomas Windmills', *Antiquarian Horology* June 1987, p. 573-584; p. 576, quoting from E. F. Bunt, 'An eighteenth century watchmaker and his day-book', *Antiquarian Horology* March 1973, 175-182: p. 179.

and interpreted this reference as some form of ‘collaboration’, this outsourcing was simply the standard *modus operandi*. Gray was a noted supplier of repeating work. It can be expected many other makers delivered movements to him for the fitting of such repeating work, and then the movements were returned. If such a circulation of a watch around a series of specialists becomes an entirely standard practice early on, why not also for clocks? Quare is a case in point. He traded in both watches and clocks, and his commercial practice may have been the same across both domains.

### The surviving clocks

DDP note evidence of two separate groups of similar clocks, one characterised as ‘crude and artless’ in design and construction, and the other as: ‘attractive pieces and very well made’.<sup>16</sup> It is only the latter grouping which is the subject of the theory discussed in this article, and the preliminary information given here reports on data provided by the two antiquarian horologists referred to in the introduction.

There are significant numbers of survivors of such clocks, which may be evidence of a large workshop, and by inference a significant controlling mind, as owner or operator. An important point to make about these clocks is that their movements coming from a single source is no reflection on their quality, or indeed their interest to an antiquarian. The quality of the known examples is exceptionally high, comparable with the best of seventeenth-century work. The finish and gilding is superb, such that many established makers (including Tompion) confidently signed them as their own. Hence the remark by DDP that these are ‘attractive pieces and very well made’. An ambition for the present research project is that, with the help of the readership of

*Antiquarian Horology*, it might be possible to determine if such a group definitely exists, and if so, to define more precisely the characteristics of such movements. If such a group is identified, another aim might be to identify the possible source, in just such a way as Daniel Quare is accepted as the originator of many others.

As well as numerous unsigned clocks, both weight- and spring-driven, probable examples have been detected under the names of Richard Colston, William Clement, Edward and Thomas Burgis, John Aylward, Thomas Herbert, John Davis (of Windsor and London), Edward Hutchinson, Edward East, Fromanteel, Joseph Knibb, Henry Jones and Thomas Pare. It is speculated that there are many more. There are even two such examples signed Thomas Tompion.<sup>17</sup> It is remarkable that the Tompion examples have not previously been discussed much, as they bear little stylistic resemblance to his other work. Note also that it was not just DDP who identified possible examples—the broad proposition of the workshop in question has been remarked on before elsewhere.<sup>18</sup>

The movements in question, produced over a period of approximately sixty years circa 1660–1720, evolved in keeping with the horological developments of the time. Nevertheless, they can be identified by a number of hereditary, decorative, and elemental design features, — a form of horological DNA. There are many examples to be found in the catalogues of auctions over many decades, and in the pages of books about Golden Age clockmaking.

It is not claimed that individual features are absolutely definitive, but the proposition is that the experienced eye can identify a number of defining features, which when considered collectively go beyond coincidental similarity.

16. DDP, *Early English Clocks*, p. 394.

17. *Antiquarian Horology* June 2001, p. 126; J. Evans, J. Carter and B. Wright, *Thomas Tompion 300 years* (Stroud: Water Lane Publishing Ltd, 2013), p. 314.

18. See for example *Antiquarian Horology* March 2007, p. 107, where clocks by Colston and Burgis are referenced with the comment ‘it seems likely that they all come from the same workshop’. But more significantly, see Roger Aghib, ‘The elusive Fromanteel’, *Antiquarian Horology* September 1969. Discussing a clock signed A. Fromanteel, Newcastle, Aghib comments: ‘I have seen this exciting and rare repeat mechanism on clocks bearing the signatures of Colston, Clements (both eminent London makers) and John Aylward (of Guildford, Surrey). There is little doubt in my mind that these clocks emanated from the same workshop.’



Fig. 3. Spring-clock, signed Edward Burgis, c. 1695.

There follows a detailed description of some of these defining characteristics, which potentially identify the products of the hypothetical 'wholesale' workshop. When considering these characteristics it is also important to bear in mind however, that later restorers, even with the best intentions, may more recently have added to clocks some of the features described below, as part of the restoration process, and clocks known to have been heavily restored should always be looked at in this light.

### External features

Common features suggest that these clocks were supplied as complete mechanisms ready to be cased. No research has yet been considered about the cases. It would be interesting to see whether there are any tell-tale similarities to be found in cases within the group, but currently the supposition is that only movements with dials and hands were supplied. The example shown in Fig. 3 is signed Edward Burgis, and offers a classic example.

### The dial and hands

In the earlier period during which this workshop is thought to have operated, most clocks featured a gilt-brass dial plate with cherub spandrels and a silvered chapter ring. The dial plates are found to be of good quality, and judging by the remaining gilding on the surface of many examples, were treated to unusually high-quality gilding. This supports the theory that the clocks were supplied ready for market, not as 'rough movements', as was the practice in the watch trade. The retailer's name, when added, was typically engraved into the dial plate or (in the later examples) on the chapter ring adjacent to the Roman numeral VI position.

Naturally, the clocks in question conform to the more general styling of the period but are quite distinct from the norm in their detail. For example, most clocks in this series feature finely chased and highly distinctive hands regardless of the 'maker' to whom the clock is ascribed (Fig. 4). The style is recognisable by an hour hand with large centre-boss and tear-drop cutaway, and a needle-shaped minute-hand with scrolled support featuring three deep scallops (Fig. 5). Comparing the style of hands found on a given clock with that of others from clocks signed by the same maker can be revealing. Some clockmakers produced in a style which became associated with that individual or workshop. If however a movement is found by such a maker with hands which differ from their 'norm', but match the pattern shown here (remembering the caveat about restoration which particularly applies to hands), it is worth looking closely at some of the movement features to consider whether the movement in question might derive from this putative source. For example, a clock illustrated in *Thomas Tompion 300 Years* has hands of this design, quite unlike the other Tompion clocks in the book,<sup>19</sup> and further examination of the images reveals other differences from Tompion's usual output.

### The movement

The following section introduces movement features from both longcase and table clocks

19. Evans, Carter and Wright, *Thomas Tompion 300 years*, pp. 314–5.



Fig. 4. Hands of a clock signed John Davis of Windsor, c. 1680. Photo: James Nye (© Harris (Belmont) Charity).



Fig. 5. Hands of the spring-clock in Fig. 3.

associated with this grouping. Fig. 6 shows the back plate of another spring-clock signed by Edward Burgis. The feature of particular interest here is the distinctive decorative apron covering the back cock. Another feature, just visible, is the cheese-headed

style of the screws. Their thread profile is usually extremely well-formed, quite unlike the shallow, cruder threads of other screws of the period, which were often the product of more primitive screw plates.



Fig. 6. Rear plate of a spring-clock, signed Edward Burgis, c. 1695-1700, with pull-repeating.

### Back cock

This component (Fig. 7), from an example of one of the later clocks in the series (post 1700), has a distinctive footprint with lobes on each side. It is normally secured by cheese-

headed screws. The back cocks are evident on both verge table clocks and longcase clocks where an anchor escapement is used.



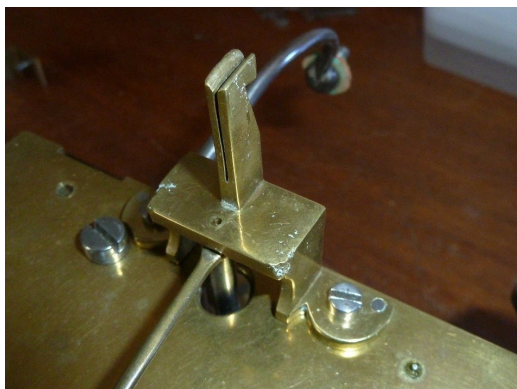


Fig. 7. Back cock from a post-1700 clock, showing the distinctive lobes, cheese-headed screws, and brass crutch. Image: Laurence Harvey.

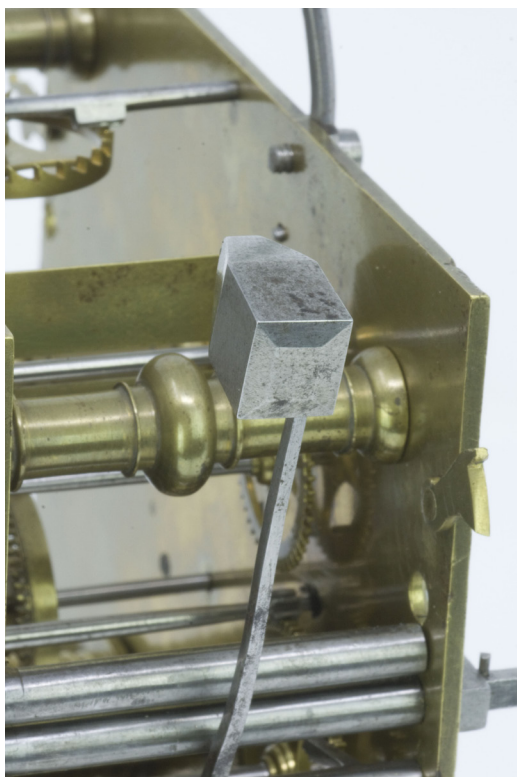


Fig. 8. Hammer head from the Burgis clock in Fig. 3. Note the square stem, and characteristic shaped head.

### Steel work

Observations of the steel components can often be made without separating the plates. More tell-tale characteristics of the clocks in question may be found here. Steel components are often robust in construction, but they are not lacking in finesse. The bell stand has a carefully made teardrop footing, and a



Fig. 9. Count-wheel from the same Burgis clock.

substantial steady is formed at the end to locate with a hole on the plate to prevent movement. Usually the foot (as opposed to the brass back plate) is drilled and tapped to facilitate secure fixing onto the plate, and the steel thread allows the screw to be driven tight without the risk of stripping the thread. Fig. 8 illustrates a heavy hammer head supported on a squared arbor and square-section stem, on a clock signed for Burgis. It has been carefully filed and finished.

### Under dial work

Collectors may not wish to dismantle their clocks in the furtherance of this project, but restorers and repairers may be familiar with some of the features found here. The movements are fully latched, which is to say that the dial feet are secured by swivelling latches, as are the pillars which separate the front and back plates.

Table clock set-up ratchets are ringed in a similar manner to that seen on the count wheels of both spring-clocks and longcase clocks (compare Figs 9 and 10). Sometimes the click spring, which serves both clicks, is manufactured from a single brass strip (presumably work-hardened) and secured by a single screw in the centre (Fig. 11) a locating pip formed into the wrapped section provides security in operation. The clicks themselves may be made either from brass or steel and are often highly decorative in design. Again the care taken is indicative of high production values.



Fig. 10. Ringed set-up ratchets from same Burgis clock.



Fig. 11. Distinctive click-spring from the same Burgis clock.

## Repeating work

Striking release and repeating work is also highly distinctive (see Fig. 12). Descriptions of mechanisms of this complexity are difficult to follow without access to a tangible example, but a detailed description with many photographs may be found.<sup>20</sup> Earlier movements without repeating have an axe-head-shaped lifting lever, with a 'through-the-plate warning lever', as seen earlier. This

design remained unchanged for many years, giving the later mechanisms a rather 'dated' appearance.

The design of the repeating work is generally thought to be poor, and provides significant problems for repairers and restorers. Clocks may therefore be found with alterations, made over subsequent centuries. Conversely, the repeating work in many clocks of this type has been removed in the past, and in more recent times restorers have reconstructed it, so examples may exhibit modern work.

Many of the components described in this section are common to both spring- and weight-driven clocks. It is assumed that readers will be able to make their own comparisons between them. Bolt and shutter maintaining power is frequently provided to weight-driven clocks. The maintaining force is provided by loading a coiled steel spring as seen in Fig. 13.

Examining the back plate, early examples feature an external count wheel with a locking piece extending through the plate, a feature

20. See for example DDP, *Early English Clocks*, pp. 392–8.

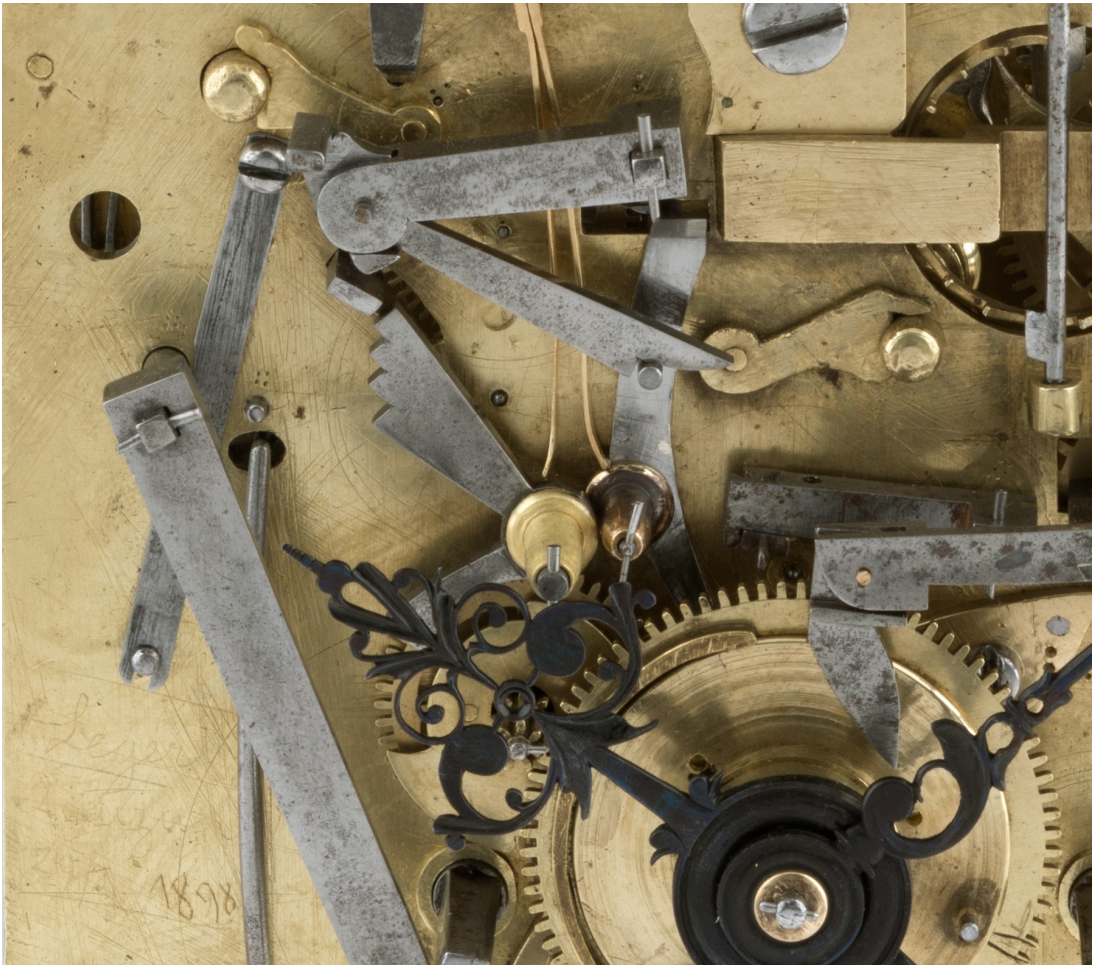


Fig. 12. Characteristic repeating work on a spring-clock by Richard Colston, c. 1690. The hands may be later, they do not conform. Image courtesy of Ben Wright.

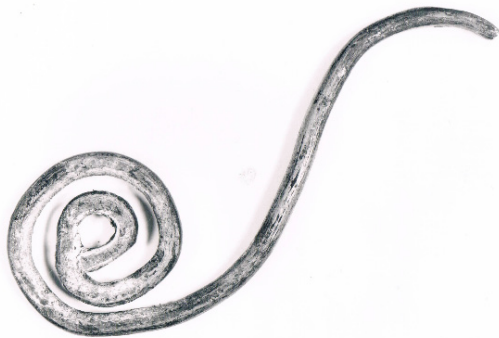


Fig. 13. Steel spring for maintaining power from a clock signed William Clement, c. 1680. Image courtesy of Jonathan Betts.

seen on the spring clocks and longcases.

Fig. 14 shows the count wheel from a longcase clock signed John Aylward of Guildford. The count-wheel locking-piece is common to all examples of clocks of this type.

The back cock is another feature of these clocks worth examining in some detail as it can exhibit a number of interesting features. The black and white images in Figs 15 and 16 show a relatively early but common incarnation, in this case on a longcase clock signed William Clement. Fig. 17 shows the same design, in a clock re-signed for Robert Seignior. The carrier for the pendulum's suspension spring is riveted onto an angled section of brass which is accurately dovetailed to fit the casting. Many longcase clocks in this series have back cocks made in this curious manner.



Fig. 14. Count wheel from a longcase signed John Aylward of Guildford, c. 1695.

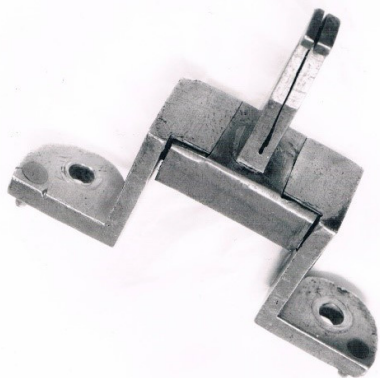


Fig. 15. Two-part back cock on a longcase clock signed William Clement, c. 1680. Image courtesy of Jonathan Betts.

It is worth briefly exploring the reasons behind this seemingly unnecessary complication. Before the long pendulum was introduced, a keeper was fitted to control the movement of the verge's knife-edged pivot, to prevent damage to the escape wheel from



Fig. 16. As Fig. 15.



Fig. 17. A similar construction of back cock on a longcase clock re-signed for Robert Seignior, c. 1680. Photo: James Nye (© Harris (Belmont) Charity).

tripping. The verge clocks in this series conform to this practice, also utilising a dove-tailed keeper, which frequently featured a decorative apron to hide it. It is this feature on the Tompion clock mentioned earlier (see note 19) that suggested this could be a clock from the hypothetical workshop, as this feature is rarely found on Tompion table clocks. Further examination revealed other anomalies; comparisons were made and similarities found with the clocks which are the subject of this article, promoting the idea that the movement in question may not have originated in Tompion's workshop.

Returning to the back cock found on the



Fig. 18. Verge back-cock from the Burgis clock in Fig. 3.



Fig. 19. Pallets and brass crutch, from the Aylward clock in Fig. 14.

clock by Clement, most, if not all of Clement's clocks exhibit back cocks of this style. This complication may have a story intertwined with that of the introduction of the suspended pendulum. Consider that a verge and pendulum are fitted together without the need for a crutch or suspension (Fig. 18). It is logical to assume that, when experimenting with a pendulum suspension, a maker (like Clement) could have been inclined to convert an original back cock to provide a prototype by simply riveting the suspension support onto the keeper of a verge back cock. It is puzzling that this method continued without alteration. Perhaps makers of these clocks had a large stock of original type back-cock castings to use up, before making a new pattern for the back cock with integral projection. It seems testament to the manufacturing quality of these movements that this seemingly clumsily adapted component actually lasted remarkably well. It kept dust away from the back pivot and positioned the pivot point of the pendulum as near as possible to the fulcrum of the anchor's pallet arbor, as it should be. This continuation



Fig. 20. Characteristic lozenge-shaped hour bridge, with bevelled edges, from the same Aylward clock.



Fig. 21. Parallel-profiled centre arbor, longcase clock re-signed Seignior, as in Fig. 17. Photo: James Nye (© Harris (Belmont) Charity).

of tried and tested design is characteristic of sensible manufacturing practice.

When fitted, the crutch was made from brass just as the verge's pendulum had been—brass being the sensible choice because the more ductile material made it easier to adjust for beat errors (Fig. 19). The top of the crutch was drilled and shaped to fit the pallet arbor, a much simpler arrangement than one in which a slotted brass block clamped around a squared pallet-arbor, as more commonly found elsewhere.

### Under dial

Both longcase and table clocks have a number of common features. The lozenge shape of the hour-wheel bridge is found in all clocks in this group, though admittedly in others from this period as well. It often features well-formed bevelled edges on both the bridge and the feet (Fig. 20). The high level of finish and craft found on this and other components sets



Fig. 22. Bell-stand, hammer spring and hammer stop, from the Aylward clock in Fig. 14.



Fig. 23. The distinctive domed shoulder on the bell-stand of the same Aylward clock.

these clocks apart from others of their type.

When the hands are removed another feature becomes visible. The extended centre-arbor is almost parallel, in common with earlier clocks (Fig. 21). As time progressed makers began to refine this part, moving towards a more slender, tapered arbor. The conservative persuasions of our supposed workshop are again evidenced in this component which is rather sturdy and in which a parallel profile is maintained long after others had moved on.

### Other steel work

Again we find components which have been well-designed and well-finished (Fig. 22). The domed keeper at the top of the bell stand is found on most movements (Fig. 23). Again, the hammer stem often has a square profile and the cheese-headed screws with their well-formed thread are sometimes mistaken for modern replacements.

As was common practice the longcase clocks are secured to the seat board by fitting the bottom pillars onto two 'spikes' to prevent the mechanism from moving during winding (Fig. 24), and added security is provided by tethering the back plate to the back board of the case by a right-angled bracket as shown in Fig. 25. In these clocks, the back plate is often



Fig. 24. Spikes on the seat board of the Aylward clock, which prevent movement during winding.

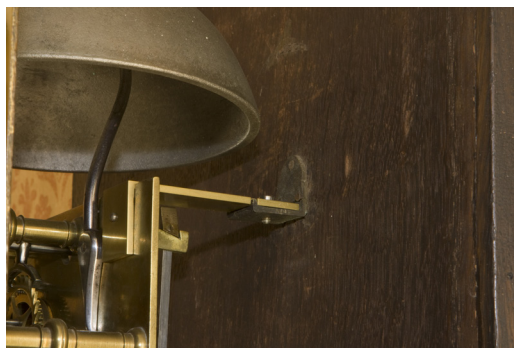


Fig. 25. Bracket to secure the movement of the Aylward clock to the backboard.

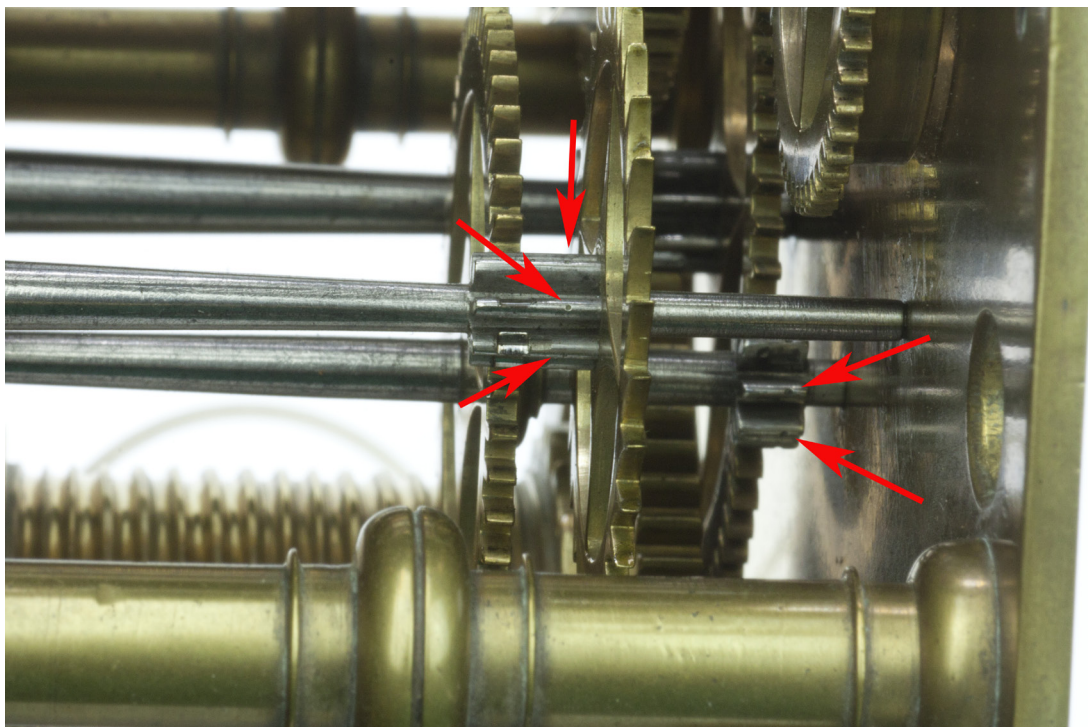


Fig. 26. Pinions showing the witness marks from original setting-out, also from the same Aylward movement (highlighted by the red arrows).

carefully recessed so that the bracket fits snugly in place.

### Between the plates

Evidence in the train and other components can reveal more pointers for these movements, though it may be argued these are less definitive by way of evidence. Interestingly, the pinions often retain witness marks which reveal the method of their manufacture (Fig. 26).

In common with other clocks of the period the plates are relatively thin. The makers

sought to add rigidity by adding an extra pillar adjacent to the escapement as evidenced in Fig. 27. This feature is found on both spring- and weight-driven clocks. Fig. 27 also shows the friction fitting for the fly, another feature where a traditional design is perpetuated over the long term. Other makers abandoned the bow spring and moved to the familiar grooved arbor, locating with a centrally placed spring and slotted fly.

Despite elements in this group remaining unchanged over long periods, some evolution

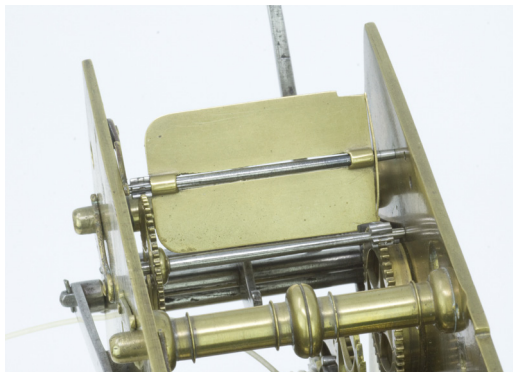


Fig. 27. The same Aylward longcase movement, with an additional pillar for strength, and a characteristic design of fly.



Fig. 28. A different longcase clock, but also signed John Aylward of Guildford, c. 1695, showing a later development, with the count wheel forming an integrated element of the great wheel, lightly riveted in.

did occur. The external count wheel eventually migrated to between the plates in keeping with other designs, and yet on these internal count wheel examples the junction between the great wheel and count wheel rim remained unusual.



Fig. 29. The rear plate of the Burgis clock in Fig. 3, showing the relatively high position of the barrels in the plates.

The count wheel rim is inserted inside the crossings of the great wheel and held in place by light riveting, and not with a flat ring secured with screws and spacing washers onto the wheel face as commonly found in more standard designs of movement (Fig. 28).

### Longcase barrels

One feature from within the mechanism is worthy of particular interest as it may have links to Dutch clockmaking of the period. In keeping with the work of the early makers, the barrels are mounted some distance from the base of the plates (Fig. 29). Later, makers used shorter plates, in all probability to reduce the overall cost of brass used, whereas this putative workshop appears to have persisted with its original design. The method of construction of the barrels is of most interest (Figs 30 and 31). First impressions may not indicate anything unusual, yet closer inspection reveals a seam across the ends and along each side of the barrel. Conventional longcase barrels were generally made either from two end-caps and a cast-brass tube, or a tube created by wrapping brass plate around a cylindrical former and brazed along a single seam. In both cases, the tubular section was fitted between end caps attached to the winding arbor. Usually in these movements however, the barrels were originally cast in two halves (two 'half-cylinders'), then brazed together, and pinned onto the winding arbor.



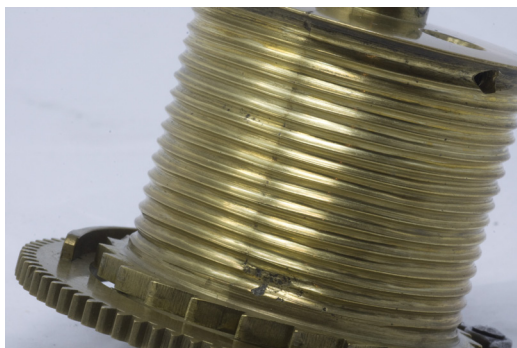


Fig. 30. Barrel from the re-signed Seignior clock in Fig. 17. Photo: James Nye (© Harris (Belmont) Charity).



Fig. 31. Another view, showing the clearly visible join of the two halves. Photo: James Nye (© Harris (Belmont) Charity).

### Some variants

Clocks with features that match the characteristic styles and features discussed here are known to exist in some relatively unusual formats. For example, there are single-handed eight-day clocks known, as well as double-handed thirty-hour variants. However, one clock in particular has caught the attention of scholars. A complicated three-train longcase movement, signed by James Markwick (Fig. 32), was discussed in detail by Winterton, and the conclusion drawn that it predates the Markwick signature it bears by a good number of years.<sup>21</sup>

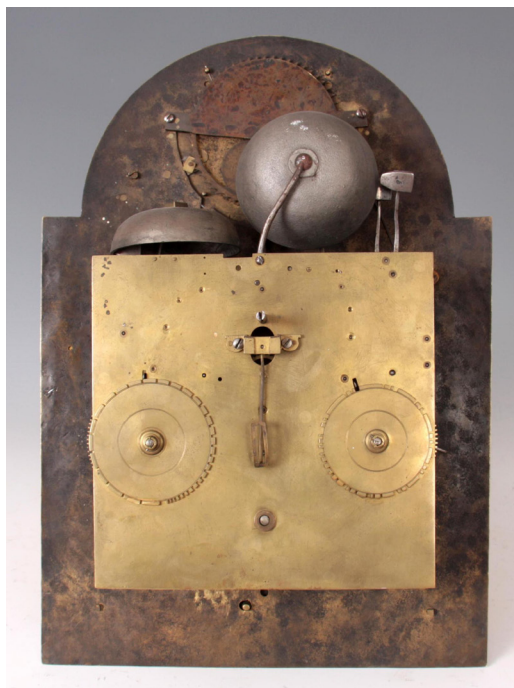


Fig. 32. The longcase movement, signed by James Markwick, discussed in *AH* March 1989. Image courtesy of Hutchinson Scott.

Readers will identify a latched movement with ringed count wheels, distinctive back-cock, a recess for the movement steady and the bell stand's domed keeper. It would not be surprising to discover that the hammer stems and hour bridge were of the design already described. Winterton believes the dial and 'James Markwick' signature are later additions. He goes on to compare the striking mechanism of this clock with that of a clock signed Tompion, which has a similar striking mechanism not found in any of his other clocks.<sup>22</sup> Indeed, Winterton considers the idea that this movement might actually have been made by Joseph Knibb. A clock signed Edward East also exhibits several similar features (Fig. 33). Again, the count-wheel locking-piece, ringed count wheel, back cock, bell stand and the hammer shaft all bear comparison with the examples already listed. Finally, yet a further movement of this type signed Thomas Herbert has been noted.<sup>23</sup> It is unlikely that

21. John Winterton, 'An Unusual Grande Sonnerie Movement', *Antiquarian Horology* March 1989, 79–84, with four photos of the clock. It was recently sold at Hutchinson Scott (24 January 2019), lot 777.

22. *Clocks* May 1988, 38–39.

23. Andrew Nicholls, *Clocks in Colour* (Blandford Press, 1975), cover and Plate 46.



Fig. 33. Rear view of the movement of an Edward East petite-sonnerie longcase clock, c. 1675. Image courtesy of Dr John C. Taylor.

three separate makers independently produced near identical movements, and indeed it is questionable whether the signatures on the clocks relate in any way to those who actually created them.

### Summary

The various features singled out for discussion above might occur in isolation on a very large number of clocks, but it is the clustering of many identifiable characteristics within single movements which is significant. Successfully proving the theory that there was a single workshop responsible for considerable numbers of identifiable clocks supplied to the trade in the period 1660–1720 relies on decades of experience in the ‘reading’ of movements, and a fully representative amount of data from surviving clocks.

A maker’s signature or influence can be detected from a combination of many subtle cues. The group of clocks in question shares much with other clocks of the period, yet it seems to embody a unifying quality, perhaps inspired by an individual maker’s philosophy and choices. A fair number of components

stick rigidly to early designs, indicating a conservative, traditional approach, perhaps repeating a style or design set down by an early pioneer.

The broad argument of this article was clearly signposted in *Early English Clocks*, but has since received no great attention. This article is intended as an overture to further study, with the hopes of gathering more data, and allowing us to come to some conclusion as to whether the case for the existence of the workshop is supportable. The author would therefore like to hear of any clocks or movements which seem to conform to the preliminary features discussed.

If you think you have, or know of, a clock with these features please contact the author by email ([horologyology@gmail.com](mailto:horologyology@gmail.com)), by post (Jon Parker, c/o AHS, 4 Lovat Lane, London EC3R 8DT) or by phone (preferably by text message) on 07971721732.

All discussions will remain in absolute confidence, and any data can remain as anonymised as any owner wishes in any further analysis or discussion

### Acknowledgements

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I have also enjoyed conversations with a number of interested individuals; the exhibition *Innovation and collaboration* held at Bonhams in September 2018 was particularly apposite, my sincere thanks go to Dr John C Taylor and James Stratton for the opportunity to examine and compare so many seventeenth-century clocks, and discuss their relevant features.

Finally, I wish to express my appreciation of the assistance of the editor whose considered critique provided much needed encouragement.