

# Salisbury, Wells and Rye – the great clocks revisited

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*There has been scholarly argument over the age of the three large wrought iron clocks of Salisbury and Wells cathedrals and St Mary's church at Rye for many decades. At whatever date the clocks were made, the author argues there is a persuasive body of evidence to support the proposition that all three clocks were by the same hand. This article is derived from the material presented by the author in the AHS London Lecture Series, as reported in Antiquarian Horology June 2014.*

## Background

The importance of the three ancient clocks from Salisbury, Wells and Rye has been championed since the 1920s, and the latter two had already received scholarly attention in the nineteenth century. Despite many significant contributions to the literature, controversy remains about the dates when the clocks were made, and who was responsible for their manufacture. Some have argued that the clocks date to the late fourteenth century, while others are unprepared to accept such an early date and instead favour the sixteenth century.

This article will not settle the matter—more work is required to take us forward in this arena, but I do set out some of the material relevant to the dating issue. If we cannot yet be confident on dating, this article does however make a strong claim with regards common authorship for the clocks.

The last major public forum for debate over the issue of dating was the 'Great Salisbury Clock Trial', organized by the AHS Turret Clock Group in 1993.<sup>1</sup> With the clock as defendant, and the charge one of fraudulently claiming to have been made in or before 1386, arguments were rehearsed

for and against the original claims for the late fourteenth-century date. The majority found for the defendant.<sup>2</sup> But the matter did not rest.

Between 2007 and 2013 I was fortunate to be engaged to undertake major conservation projects on all three of the clocks in question, and while doing so I was struck by significant similarities between the three clocks. Some of these were clearly already well documented, but other similarities appeared to me previously to have gone unremarked.

Specifically, it was the similarities shared by the Salisbury and Wells clocks, by contrast with Rye, which led me to embark on a more forensic comparison between the three, and this article sets out the results.

## Salisbury Cathedral

T. R. ('Robbie') Robinson (1905–1983) was a noted horological authority and commentator.<sup>3</sup> On holiday in Salisbury in 1928, Robinson climbed the cathedral tower to inspect the Joyce of Whitechurch clock (1883) and there found the disused ancient clock, which he realized resembled the Wells clock.

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1. Reported in *Antiquarian Horology* Autumn 1993, p. 32. The proceedings were published in 1993 as Monograph No 2 by the AHS Turret Clock Group as *The Great Salisbury Clock Trial*, edited by Chris McKay; a revised re-edition with photos inserted is currently in draft.

2. The trial was repeated in April 2018 at a meeting of the Wessex branch of the BHI, where again the 'jury' returned a verdict of not guilty by a small majority; see report in *Horological Journal* May 2018, p. 231.

3. Obituary *Horological Journal* December 1983, p. 21.

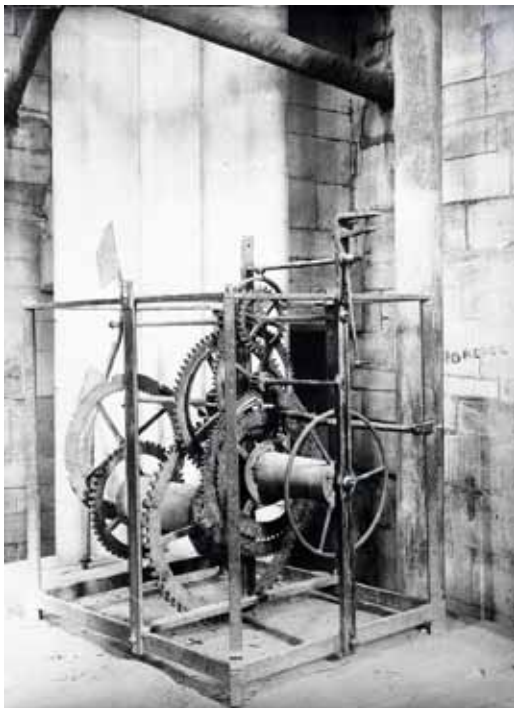


Fig. 1a. The Salisbury clock as found.



Fig. 1b. The Salisbury clock, current appearance.

Robinson brought the clock to the attention of R. P. Howgrave-Graham (1880–1959), whom he had heard deliver an inspirational lecture on ancient turret clocks at the Northampton Polytechnic in London.<sup>4</sup> Howgrave-Graham in turn contacted the friends of the cathedral, and a decision emerged to bring the clock down into the main body of the building, where it was put on display in the north transept. When found, the clock was fitted with a recoil escapement and a 1.7 seconds pendulum. Howgrave-Graham sought out early reference material in an attempt to date the clock, publishing an article in 1929.<sup>5</sup> He had been alerted to a deed, in Latin, held in Salisbury Cathedral Library, which records that a couple, Reginald Clover and his wife Alice, were responsible for the maintenance of the clock.<sup>6</sup> C. F. C. Beeson pointed out that there were yet

earlier references to a clock at Salisbury (as early as 1306), but these may (even probably) relate to an earlier device.<sup>7</sup>

The clock found by Robinson remains in the north aisle of the cathedral, but it has undergone significant work since being rediscovered. Robinson and Howgrave-Graham persuaded the friends of the cathedral to have the clock converted back to a verge and foliot escapement and the work was undertaken by Smiths of Derby in 1956. The work was extensive, and it is highly unlikely that such work would be carried out today—but the newly reconverted clock was set going for the Friends' Festival on 18 July 1956.<sup>8</sup> The parts that were removed in the reconversion have been preserved.

It appears that the clock was originally installed in a bell tower to the east of the north door of the cathedral, but this was

4. *The Great Salisbury Clock Trial*, p. 3.

5. R. P. Howgrave-Graham, 'A Great Cathedral Clock Rediscovered', *Practical Watch and Clockmaker* 15 November 1929, 445–7.

6. *The Great Salisbury Clock Trial*, pp. 5–6.

7. C. F. C. Beeson, *English Church Clocks* (Brant Wright: Ashford, 1977), p. 10, in turn quoting H. Hatcher and R. Benson, *The History of Modern Wiltshire* (Nichols & Son, 1843).



Fig. 2a. The Wells clock in an old photograph.

demolished in 1790. The clock drove a single dial, and we have some idea of it from documents dating to 1613 and 1633.<sup>9</sup> Howgrave-Graham was also convinced there were two sets of later automata driven by the clock. One showed Mary with the infant Christ in her arms, while the three Kings offered gifts. The other showed angels opening the tomb and Christ arising from the dead.<sup>10</sup>

### Wells Cathedral

The clock at Wells is among the earliest examples of a quarter striking clock—it may even be the earliest remaining example. For many years, tradition recorded it as having been made by Peter Lightfoot, a monk from Glastonbury, about 1325. This was put forward as early as 1824,<sup>11</sup> and was echoed sixty years later by



Fig. 2b. The Wells clock, current appearance.

the antiquary Octavius Morgan (1803–1888).<sup>12</sup>

The clock operated an internal astronomical dial, a striking internal jack (known as Jack Blandifer), and a series of mounted knights that revolved around a

8. The work was as follows: Going train bar altered. Pendulum bracket removed. Escapement removed. Going train main wheel arbor shortened. Drive square removed. Inner pivot extended. New escape wheel cock manufactured. New 17 inch escape wheel manufactured. New foliot and cock manufactured. 12 inches of worm eaten wood removed from barrel. Beech winding jacks removed. Rotten wood removed from the oak strike barrel. New winding handle manufactured and fitted. Hammer lifting arm altered, new brackets made and fitted to clock frame.

9. Quoted in *The Great Salisbury Clock Trial*, p. 7.

10. 'The Travels of Leo of Rozmital' translated by Malcolm Letts, quoted in R. P. Howgrave-Graham, 'Automata at Salisbury', *Antiquarian Horology* December 1957, 91–2.

11. John Britton, *The History and Antiquities of the Cathedral Church of Wells* (Longman, Hurst: London, 1824), p. 116.

12. Octavius Morgan, 'Notes on the Ancient Clocks at Wells, Rye and Dover', *Archaeological Journal*, vol. XL (London, 1883), 428–32, later partly reprinted as 'Notes on the Ancient Clocks at Rye and Dover' in *Horological Journal* January 1917, 53–55. Morgan saw the clocks in 1853 and made detailed drawings, which are preserved in the British Museum horological archives and were reproduced in David Thompson, 'Octavius Morgan, Horological Collector. Part Six', *Antiquarian Horology* December 2005, 189–216; pp. 190–92.

centre at the hour. The clock drove two external dials and two external jacks, both sporting armour of a late fifteenth century pattern. The clock was in use until 1835, and was subsequently transferred to London in 1871, where it remained on loan to the Patent Office Museum, until 1884, when it was transferred to the Science Museum, where it remains to this day, recently moved from the now closed horology gallery to a more prominent position on the ground floor (Fig. 2b). As at Salisbury, the clock was converted from a verge and foliot escapement to a recoil escapement, and the escape wheel signed 'Samuel Tyte Burcott July 1807'.

Howgrave-Graham produced a monograph on the clock in which he summarized the evidence for dating the clock, concluding in particular that the evidence of the cathedral rolls (payment to the custodian of the clock) suggested 'the most important features of the present clock were finished by 1394'.<sup>13</sup>

Howgrave-Graham was the leading proponent of the hypothesis that a link could be found between the clocks at Wells and Salisbury, in the form of Ralph Erghum, Bishop at Salisbury from 1375 to 1388, and then Bishop at Bath and Wells from 1388 to 1400. Owing to the striking similarity of the Wells and Salisbury clocks, they are argued to be contemporaneous. Both cathedrals have documents that record the existence of clocks during the periods of Erghum's office. The coincidence of two clocks apparently from the same stable appearing in both cathedrals, and the same Bishop

being in office in both locations, was argued to point to his likely sponsorship of such clocks in the late fourteenth century, a proposition that has recently been queried by Chris McKay.<sup>14</sup> However, in the years since Howgrave-Graham first popularized this early dating, there has been considerable scholarly backlash, and dating as much as two centuries later has been advanced.<sup>15</sup> Debate continues.

### St. Mary's Church, Rye

As one of the best known church clocks in England, the clock has attracted significant coverage in the literature. E.J. Tyler first lectured on the subject in 1961,<sup>16</sup> and then brought together much material in a 1976 article.<sup>17</sup> It is clear that there was at least one clock in the tower before the present one, perhaps even a second. The first reference in the church's records dates to 1514–15 when the sexton was noted as being paid to keep the 'clock and chyme'. This is a very early occurrence of a set of chimes.

The clock is well known to the visiting public for two features—its long pendulum hanging down into the nave, and the external quarter jacks, added in 1761, though the records show there were quarter bells prior to this date. Tyler argued that the clock was supplied for the sum of £30, in 1561, by Lewis Billiard, who worked for Alan Bawdyson, the Royal Clockmaker, and lived in Westminster. It is not possible to tell if the quarter train could date to as early as 1561, owing to the presence of later alterations, and the train having been

13. R.P. Howgrave-Graham, *Peter Lightfoot, Monk of Glastonbury and the Old Clock at Wells* (Avalon: Glastonbury, 1922), p. 48.

14. Letter to the Editor 'Bishop Erghum' in *Antiquarian Horology* March 2016, 135–6, concluding robustly: 'Unless hard evidence is found to the contrary, Howgrave-Graham's rhetorical question of 1954 should be seen for what it was, and there should be no further references to a presumed involvement of Bishop Ralph Erghum in the commissioning of the clocks at Salisbury and Wells.'

15. In particular, C.N. Ponsford and J.G.M. Scott, 'A New Look at the Dating of Early English Clocks', *Antiquarian Horology* Spring 1980, 50–69. However, contra this, see D.F. Nettell, 'A New Look at the Dating of Early English Clocks', *Antiquarian Horology* Autumn 1980, 301–3.

16. E.J. Tyler, 'The Turret Clocks of Rye Church', *Antiquarian Horology* March 1962, 292–97. He referred to Octavius Morgan's visit to the clock in 1853 and to his article in *Horological Journal* January 1917, evidently unaware of the original 1883 publication.

17. 'Rye Church Clock', *Antiquarian Horology* Winter 1976, 41–54.



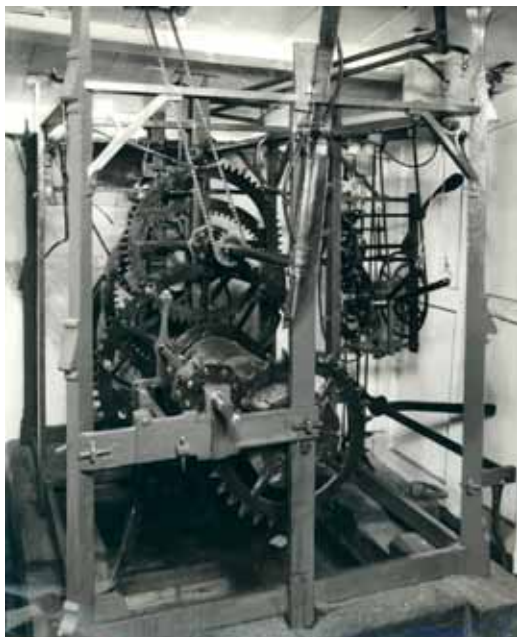


Fig. 3a. The Rye clock in an old photograph.

re-wheeled. I think there is a strong possibility that the clock is older than 1561, but that quarter striking was a feature added by Billiard to an older clock movement. I develop this thought when considering design elements later in this article, hence the design of the quarters and the addition of the corner frame braces, which are not by the same hand as the frame itself. Also in the case of the Wells movement, the quarter train releases the hour strike, with the quarters themselves being released by the going train. In the case of the Rye clock both the hour and quarters are released by lifting pins on the going train mainwheel. In my view, this supports the theory that the quarter striking train is a later addition in the Rye clock.

Of relevance to this article, Tyler noted the previous scholarly attempts to relate the Rye clock to those of Wells and Salisbury, but he was unwilling to attribute much weight to the physical similarities that underpinned such arguments.



Fig. 3b. The Rye clock, current appearance.

### The physical evidence

Conservation work by the Cumbria Clock Company on Salisbury, Wells and Rye offered a chance for a re-evaluation of the physical evidence. Work was undertaken at Salisbury in 2007, at Wells in 2010, and finally at Rye in 2013.

While the same details that had been commented on before were re-examined, some new similarities between the three clocks came to light. These are illustrated for each of the three clocks in the following images and tables (Figs 4 to 23).



Fig. 4. Decoration of the train bars, left to right Salisbury, Wells and Rye.



Fig. 5. Shape of the tenons, left to right Salisbury, Wells and (below) Rye.



Fig. 6. Feet of the corner posts, left to right Salisbury, Wells and Rye.

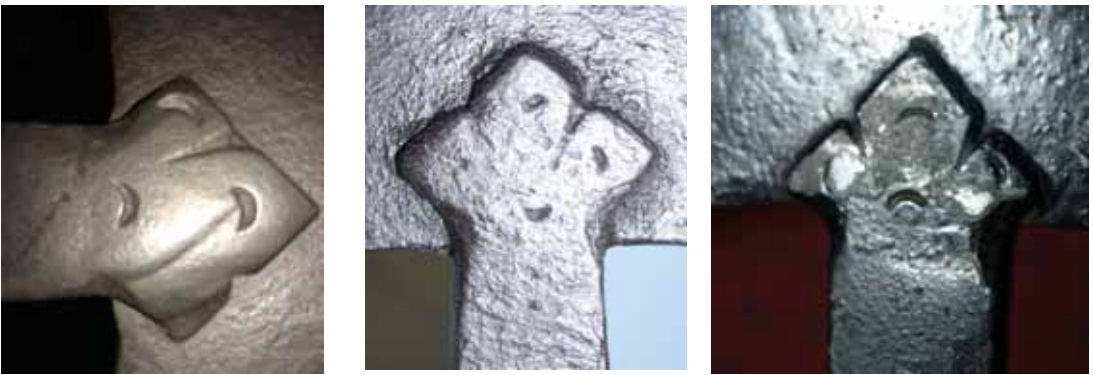


Fig. 7. Details of the trefoils which form the joints between the wheel rims and crossings, left to right Salisbury, Wells and Rye.



Fig. 8. Fly fans and ratchets, left to right Salisbury, Wells and Rye.





Fig. 9. Details of pinions, left to right Salisbury, Wells and (below left) Rye.



Fig. 10. Details of tooth forms, left to right Salisbury, Wells and (above right) Rye.

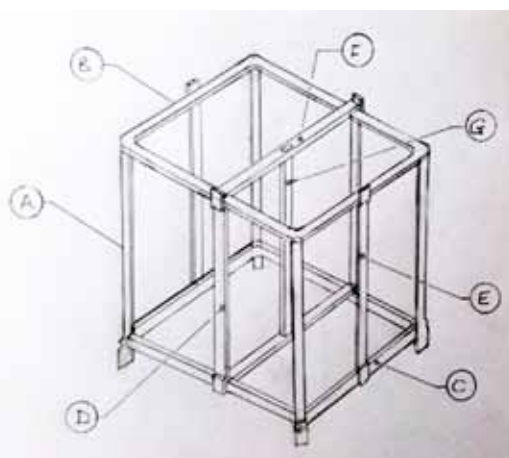


Fig. 11. Winding barrel click work, left to right Salisbury, Wells and Rye.



	Top Frame (B)	Bottom Frame (C)	Corner Post (A)	Train Bars (D,E,F,G)
Salisbury	2.25x0.75 in. (57x19 mm)	2.5x0.75 in. (64 x 19 mm)	1.375x1.625 in. (35x41 mm)	2.25x0.75 in. (57x19 mm)
Wells	1.875x0.625 in. (48x16 mm)	2.5x0.75 in. (64x19 mm)	1.375x1.625 in. (35x41 mm)	2.25x0.75 in. (57x19 mm)
Rye	2x0.625 in. (51x16 mm)	2.25x0.75 in. (57x19 mm)	1.375x1.625 in. (35x41 mm)	2.125x0.75 in. (54x19 mm)

Fig. 12. Material dimensions of the three turret clocks; see key below.



	Length (A)	Height (B)	Depth (C)
Salisbury	49.875 in. (1267 mm)	49 in. (1245 mm)	40.75 in. (1035 mm)
Wells	46.25 in. (1175 mm)	45.5 in. (1156 mm)	33 in. (838 mm)
Rye	49 in. (1245 mm)	44 in. (1118 mm)	37.5 in. (953 mm)

Fig. 13. Frame dimensions of the three turret clocks; see key below.

Going trains	Great Wheel
Salisbury	100
Wells	90
Rye	120

Striking trains	Great Wheel	2nd Wheel	2nd Pinion	Fly Pinion
Salisbury	64	64	8	8
Wells	64	48	8	8
Rye	64	64	8	8

Fig. 14. Train counts of the three turret clocks.

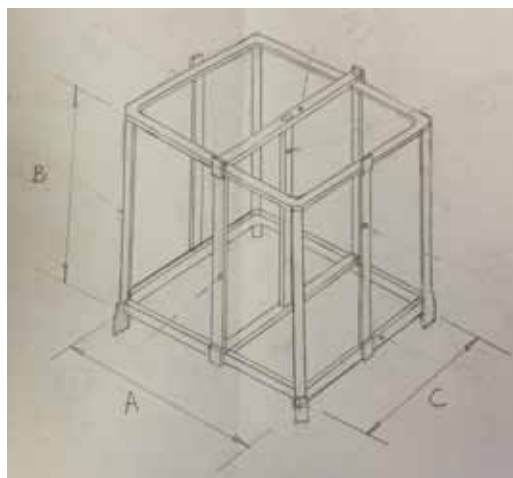




Fig. 15. Evidence of the fixing of the bottom cocks for the verge and foliot escapement, left to right Salisbury, Wells and Rye; the Salisbury clock shows a replacement by Smiths of Derby (1959). In all three clocks, the cock was positioned just above the second arbor of the going train.



Fig. 16. Countwheels, left to right, Salisbury, Wells and Rye, all with evidence of release pins, in respect to Wells and Rye both have evidence of having four pins, highly likely for the release of chimes, but in the case of Salisbury there is evidence of only one pin, perhaps activating the automata.

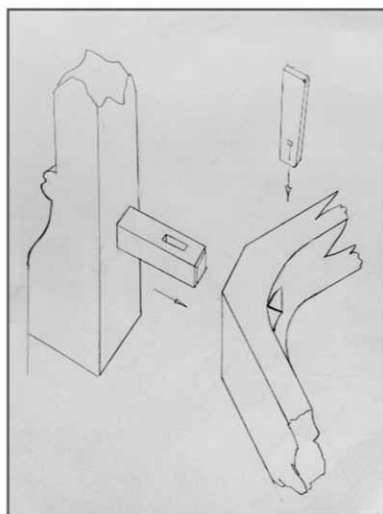


Fig. 17. The bottom section of the construction of the frame (Salisbury) showing the detail of the mortice and tenon, and the recessing into the upright corner post by the bottom rectangular frame. All three clocks exhibit the same construction. This construction, along with the interlocking train bars, confers two advantages. The particular combination of horizontal and vertical elements in the frames of the clock confer excellent strength. Further, the method by which the train bars support the rectangular frames shows an understanding of the forces applied to the clock by the driving weights, making it very strong and stable. The method of construction also allows for greater ease in initial transport from the place of manufacture, and then lifting in parts to the relevant position within the tower.

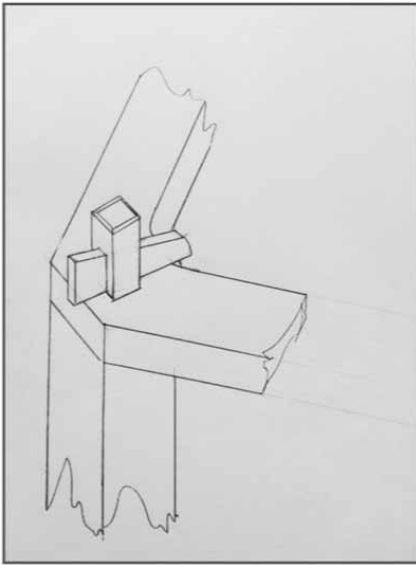


Fig. 18. Detail of the top corners of Salisbury and Wells. Both are constructed in the same manner.

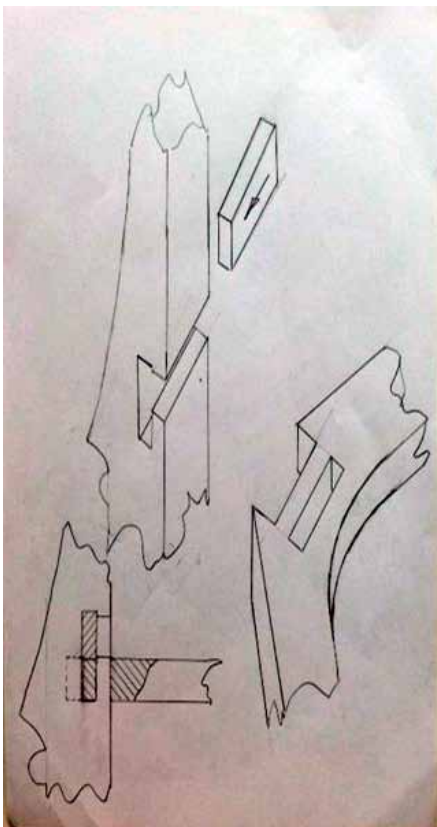


Fig. 19. Rye top corner detail. This shows a different construction from Salisbury and Wells, often found in chamber clocks, but arguably insufficiently robust for a turret clock.



Fig. 20. Rye corner braces. These appear to be later additions to strengthen the inherently weaker top joints, necessitated by the addition of the quarter-striking train, suspended to the side of the main frame, the weight for which imposes a strain on the whole construction.

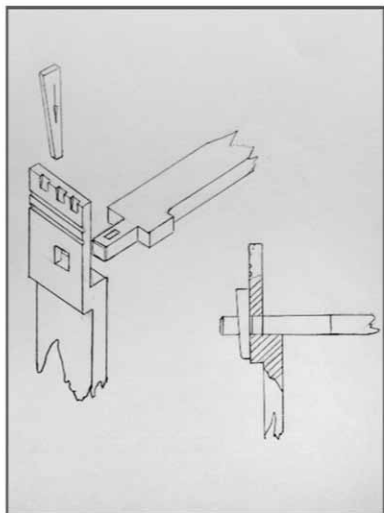


Fig. 21. Top train bar fixing. The same construction is used in all three clocks. It gives strength and support to the main frame.



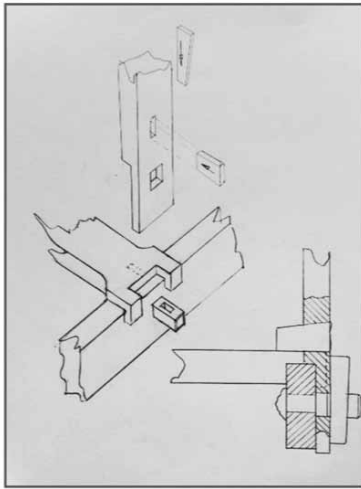


Fig. 22. Centre support post, bottom fixing. Again, the same in all three clocks. It provides good support for the main frame.



Fig. 23. Rye front train bar (going and striking) detail. A type of joint more often found in chamber clocks, which, though beautifully crafted, allows for movement of the train bar once in position. It lacks necessary rigidity, and suggests an earlier date, not later.

### Comparisons with other clocks

It has been traditional in the literature to look for similarities of construction with other well-known clocks. By contrast, it is also instructive to highlight differences. For example the late fourteenth-century clock at Chioggia is of significantly lighter construction. It has a riveted frame, and the tooth form is quite different.<sup>18</sup> At Hampton Court, the mid sixteenth-century clock retains very little of its original wheelwork and comparisons are of little value. The late sixteenth-century clock at Jumièges (Fig. 24) displays a similar style of frame construction, with its feet at an angle. However it has no comparable decoration, and the wheelwork, barrel-click-work and the fly assemblies are all quite different. Much the same distinctions can be drawn with the clock at Rouen, by Jehan de Felains, initially dated 1389 (to the satisfaction of Howgrave-Graham, Allan Lloyd and others), though argued to be much later by some (Ponsonby and Scott again).

Parallels are also possible with chamber clocks. Brother Paulus Almanus compiled a manuscript in 1475 while in Rome, describing thirty clocks entrusted to his care by various dignitaries.<sup>19</sup> The second clock illustrated exhibits corner posts very similar to those of the Rye clock. In his 1961 lecture, E.J. Tyler cited a chamber clock taken by Willem Barendsz to Nova Zembla in 1597, now preserved in the Rijksmuseum.<sup>20</sup> Once again it exhibits the same corner posts as the Rye clock.

### Conclusions

Close examination of the clocks has led me to believe the three clocks are by the same hand. In essence, I see this as the most likely explanation of the significant number of detailed points of close similarity. This conclusion does of course offer its own problems. A date of 1561 for the Rye clock cannot sit comfortably with dates in the



Fig. 24. The late sixteenth-century clock at Jumièges in the Normandy, France.

late fourteenth century for the other two clocks.

If Bishop Erghum were indeed involved in the securing of new clocks for Salisbury and Wells, there is no role visible in his securing the Rye clock, whether for its present site, or some other original site, from which the Rye clock was later removed, to be installed in its later location. If Billiard were responsible for making the Rye clock, it could be argued as likely he must also have been closely involved in the making of the Salisbury and Wells clocks—by definition in the mid-sixteenth century—yet no evidence has emerged to link Billiard to the other two clocks.

Another suggestion is that Billiard was not the original maker of the Rye clock, but instead the clockmaker who sourced a clock

18. Marisa Addomine, 'A Fourteenth Century Italian Clock', *Antiquarian Horology* June 2016, 213–22.

19. See John Leopold, *The Almanus Manuscript* (London: Hutchinson, 1971).

20. Tyler, 'Rye Church Clock' (1976), p. 43, claims that the clock is 'assumed to date from c. 1550', however on the Rijksmuseum website the suggested date is c. 1590-c. 1596, the decade of the expedition to Nova Zembla.

from another location, and to which he added the quarter-train, as well as strengthening the frame at the same time. Arising from this suggestion is another, that Rye might actually be the earliest of the three clocks. It is the evidence of the frame that offers the most compelling reason to see the Rye clock as the first of the three. The Salisbury and Wells clocks have better designed and stronger frames. It is logical to see them as successors, not precursors, to the Rye design, which has been strengthened.

One feature of the clocks that accords with historic practice is that there are differences between the three in the standards of blacksmithing and finish. From Beeson's account of the making of a clock at Perpignan we learn that a carpenter would be employed to make patterns for the

shaping of rough iron parts, and Anthoni Bonelli, the clock master, also employed local blacksmiths for much of the construction, leading to such variations.<sup>21</sup> The finer work in all three clocks is, however, very similar.

My conclusion is that the clocks of Salisbury, Wells and Rye are by the same maker and consolidates what in the past has been a general proposal. Hopefully ongoing research and new discoveries will take us onto revealing a better understanding when these clocks were made and by whom.

### **Acknowledgements**

I am grateful to James Nye for significant help in drafting this article, and also wish to thank Marisa Addomine and Chris McKay for their invaluable support.

21. C.F.C. Beeson, *Perpignan 1356: The Making of a Clock and Bell for the King's Castle* (Ticehurst: AHS, 1982), pp. 13–15.