British Horology Times

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British Horology Chapter 159 of the National Association of Watch and Clock Collectors, Inc

Clockmaking - The Golden Age

By Dennis Radage (Vancouver, Canada)

Horological books, Journals and many lectures refer to a particularly innovative and active time in English horology known as the ***Golden Age of English Clockmaking***.

However, it is important to note that during The Golden Age, the terms clockmaking and watchmaking were usually used interchangeably. Clockmakers made and retailed watches and watchmakers generally also made clocks.

Early short pendulum verge and crown wheel escapement movement with external count wheel strike

Just about every discipline including technology, the arts, literature and sciences had a golden age. Horologists often ask 'when was The Golden Age of English Clockmaking, what did it entail and what does the term really mean?' Some suggest the period was the last quarter of the seventeenth century, others claim it was the last half. There are opinions that further extend The Golden Age to one hundred years or more, from the late 1650's to the 1750s, or possibly even longer.

The term Golden Age generally signifies a period during which a very high level of achievement is reached in a particular field, in this case horology, or clock- and watchmaking.

Prior to the mid-seventeenth century, England was lagging in horological innovation. Many of the best clocks were either imported from the continent or specialist makers were commissioned by the monarchy and aristocracy in England to design and fabricate a specific domestic clock, or more likely, a tower clock.

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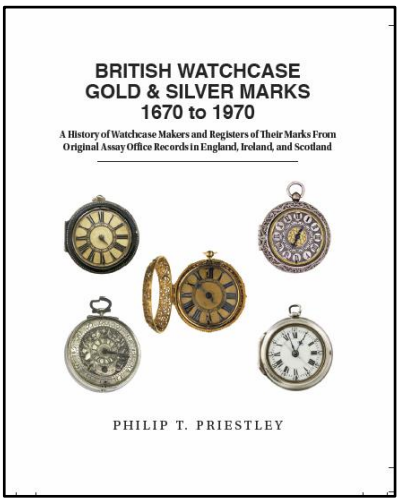

British Watchcase Gold and Silver Marks 1670–1970 by Philip Priestley is now available at the NAWCC Store. Philip, a Silver Star Fellow and longtime BH member passed away earlier this year.

President's Message:

Our National Convention has come and gone and many thanks are extended to our secretary, Marion Krajewski and her co-chair Lu Sadowski on organizing and delivering such a splendid anniversary celebration. Thanks are extended to all our Chapter members who gave of their time to help the Chapter with the display in the Mart Room. You folks are the greatest!

Our Chapter meeting at the National was truly successful and Jim Cipra made a wonderful presentation on Equation of Time Clocks which was truly appreciated. Ken Johnston presented Jean Priestley with a portrait of her late husband, Philip, who was an influential member of the Chapter and had introduced many of our members to the horological treasures of the United Kingdom through the many tours of that Nation that he and Jean organized. Philip was a well respected author on horological topics. The portrait was painted by Ken's wife Yvonne. The chapter will miss Phil's presence and wisdom, as do I, personally.

There have been some changes in the Chapter organization in the last few months. Long time member, Frank Del Greco has decided to step down as advisor to the Chapter. Frank's knowledge of horology and his willingness to assist, especially with the newsletter, will be missed greatly. Thanks Frank for all you have done for us.

Ken Johnston has agreed to act as advisor to our Chapter. Ken is a past president of Chapter 159 and brings an understanding of our goals as well as an enthusiasm for our success. Welcome back to the team, Ken.

When welcoming folks who have taken up some of the work of the Chapter, I would be remiss if I did not mention and thank Andy Dervan. Andy has agreed to act as editor for the British Horology Times (this newsletter). His writing skills are very much appreciated by myself but paricularly by V.P., Rich Newman, who for the longest while has been producing this newsletter. Way to go, Andy we sure are glad that you've answered our request.

Our next meeting will be at the Florida Regional in February. We are very please that Howard Gitman will be making the presentation at the meeting on some of his fantastic collecting finds. Since the spring edition of the newsletter may not appear before our April meeting, I invite you all to consider attending the Southern Ohio Regional where our presenter will be Graham Jones who will talk on Sundials.

Chapter 159 has agreed to act as co-host for the 2020 NAWCC National Convention in Dayton, Ohio. We are going to need lots of help to make the convention a success. Please plan now to attend and volunteer to assist at this convention.

Looking forward to seeing you at our meetings.

Cheerio, Bob

(Continued from page 1)

From the beginning of the seventeenth century England did have its own domestic clock, the weight-driven lantern clock. The lantern clock, usually of thirty-hour duration, and sounding the hours on a large bell, was popular for slightly longer than a hundred years.

The lantern clock is not generally considered an extraordinary achievement as many of the concepts used in these clocks were already used in gothic-style clocks made in Europe, however it was indeed English.

Huygens is widely considered as the one who succeeded in applying Galileo's pendulum theories. Coster helped develop a pendulum-regulated clock was developed in The Hague. John Fromanteel, an English clockmaker, was sent to work with Coster, learning and understanding the pendulum, then he returned to England bringing with him the design concepts (secrets as they were widely called).

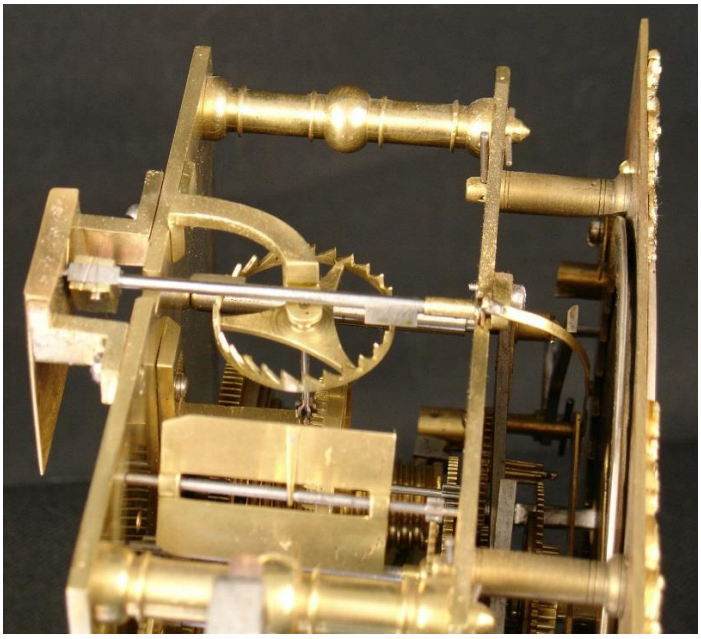

Figure 2 - Verge & crown wheel escapement

Figure 3 – Ebonized case bracket clock

Within a year the Fromanteels were advertising clocks that were pendulum regulated and which could achieve an accuracy never previously thought possible. These were no longer mere thirty-hour running clocks but ones that could run for a week, a month and even longer.

Within a short time, most of the eminent English makers, in addition to the Fromanteels, such as the Knibbs, East, Jones, Bartram, Stanton, Hilderson and others were also producing pendulum-regulated clocks. One wonders how this know-how spread so quickly amongst the important clockmakers. It would stand to reason that they communicated with each other. Practically all, at this time, were members of the Worshipful Company of Clockmakers (WCC). Their meetings were often held in local taverns and they presumably also met in the local coffee houses, which was in vogue at the time. Almost certainly new ideas and concepts were

discussed, if not shared, during these meetings. They were, after all eminent makers, members of the WCC, and knew each other well. Naturally, they were also competitors.

The pendulum concepts were quickly understood and applied by these makers. Improvements were conceived and production increased rapidly. If it had not been for the catastrophes of the plague and the Great Fire, one could speculate that advancements would have occurred much more rapidly. Many clockmaker's workshops were destroyed in the fire, thus obviously impacting progress. However, the 1660's was a period of technological innovation, following the Restoration, aided by the interest of the monarchy in the sciences, the creation of the Royal Society and Greenwich being built a little later in the 1670's.

Figure 4 – anchor escapement

Figure 5 – rack & snail striking mechanism

The typical clock was by this time regulated by a short bob pendulum, with verge and crown wheel escapement, and striking the hours with a count wheel as the controller. Most clocks were now housed in elegant cases, veneered with ebony and often with gilt mounts. Quarter repeating was introduced as were musical clocks and other complications. The introduction of the pendulum into England, I believe, can truly be considered as the beginning of The Golden Age of English Clockmaking.

Another great achievement of the 1660's was the anchor escapement, the development credited to William Clement. The anchor escapement made possible the long seconds-beating pendulum with its narrow arc of swing. This too was quickly adopted by all makers of longcase clocks, the seconds subsidiary dial also made its appearance. Floral engraving began to adorn the backplate of spring clocks, along with the maker's signature, and styles began to change. Walnut started to replace ebony, longcase clocks became taller and spring clock styles adopted a dome top replacing the architectural top.

The 1670's saw another generation of clockmakers including Joseph Knibb, Tompion, Windmills, Gretton, Quare and others. The demand for clocks, and watches, continued to exceed the output of most makers. In 1676 the Rev. Barlow is generally credited with the introduction of rack striking. This again was quickly adopted by most makers. Quarter repeat work was now easier to implement, including other complexities and grande sonnerie striking.

During the mid-1670's the balance spring was applied to watches. Huygens is often credited with its introduction, but this has been contested by Hooke and others who suggest that Hooke had applied this some years earlier. The balance spring, like the pendulum for clocks, had a profound effect on watch accuracy and reliability.

Figure 6 – 17th century watch with one & half turn balance spring

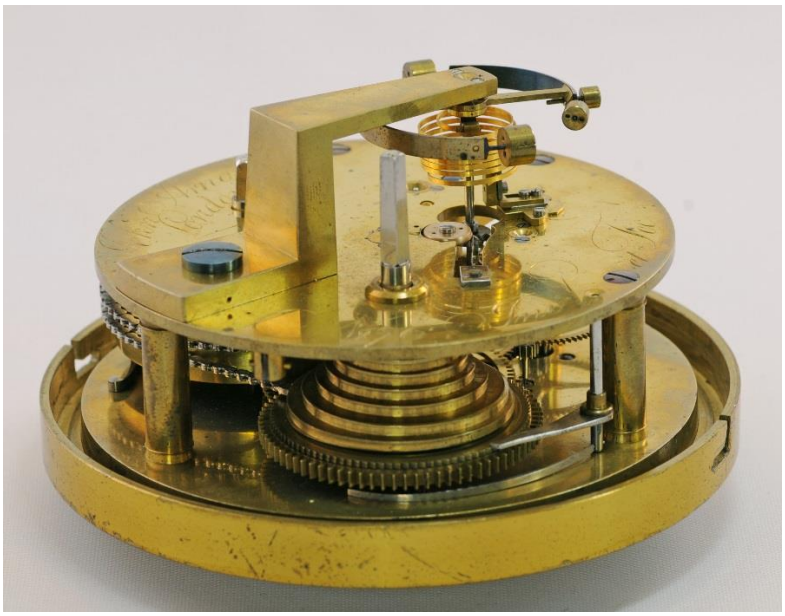

Figure 7 – chronometer with spring detent, helical balance spring

Through the 1680's and 1690's both clocks and watches reached a state of near perfection. The aesthetics of style and proportion also gave rise to increased opulence. Marquetry was added to clock cases, the designs becoming very complex. The migration of Huguenots, following the revocation in 1685 (Edict of Nantes), saw many protestant craftsmen move to London and apply their skills in gold and silver work, engraving and marquetry. There are many other examples of early innovation. They also include the suspension spring, raise and fall pendulum regulation, strike/no strike work, silent pull (striking), long-duration clocks (year-going), date features, false pendulum, all being very early.

Some suggest that c1700 was possibly the end of The Golden Age of English Clockmaking, but England still maintained its horological leadership though much of the 18th century. Ruby jeweling was patented in England in 1704 by Nicholas Facio and Peter and Jacob Debaufre. Jeweling was to remain an English 'secret' for almost the next century. Sully devised the oil sink, Pinchbeck (mock gold) was invented by Pinchbeck, Graham invented the dead beat escapement in 1719, the mercury compensating pendulum in 1721, then the cylinder escapement in 1725, all contributed to England holding its lead in watch and clockmaking. Innovation still continued as Harrison introduced the gridiron compensating pendulum in 1726 and built

precision clocks from such wood that lubrication was not need. Harrison also introduced maintaining power in 1735, the grasshopper escapement and bi-metallic temperature compensation in the later 1740's. Harrison then went on to create his sea-going clocks in order to determine longitude at sea. His H1, H2, H3 and H4 were developed over the next thirty or so years. H4, in the form of a watch, enabled Harrison to receive the 'Longitude' prize of £20,000. Further, the lever escapement was invented by Thomas Mudge in 1759.

Mahogany was introduced into case making, and as a veneer from mid-century. The painted 'white' dial was introduced in c1772.

Figure 8 – Long case Marquetry panel

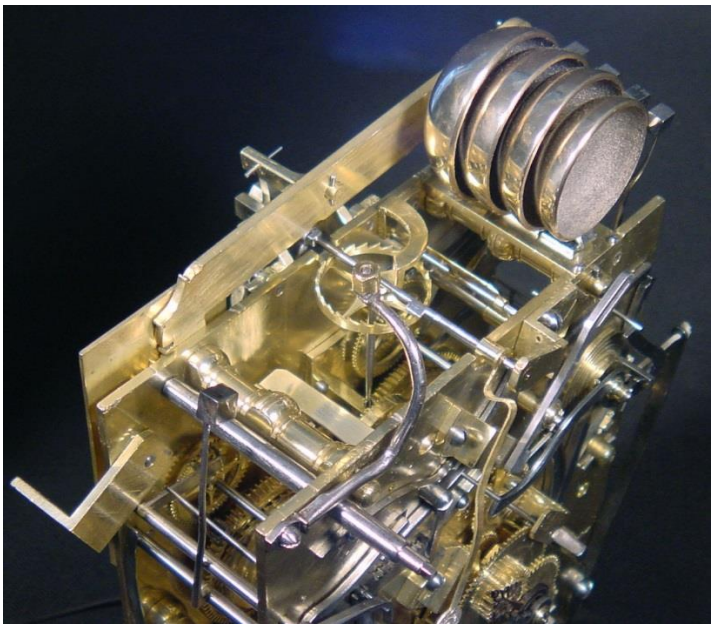

Figure 9 – Pull quarter repeating spring movement

These notes recognise just some of the more notable achievements, however the list continues with features such as the arch dial, moonphase, astronomical features, the spring detent escapement, plus the work of Arnold and Earnshaw to productionize chronometers. Many forms of dial and case decoration also changed following the aesthetic trends and styles of the period.

These eighteenth-century inventions and introductions, while England still lead in clock- and watchmaking, have many horologists suggesting that The Golden Age should, without doubt, include most of the eighteenth century. It is left to the readers to establish their own thoughts. Without doubt though, England did have its Golden Age in clockmaking.

While many of these innovations and improvements are well known, more can be found in horological reference books that focus on early makers and early clocks and watches. There are too many to list here, but

those that have the book *Charles Gretton Clock & Watchmaking - Through the Golden Age*, will find many Golden Age examples, and an extensive bibliography that notes most of the important reference sources.

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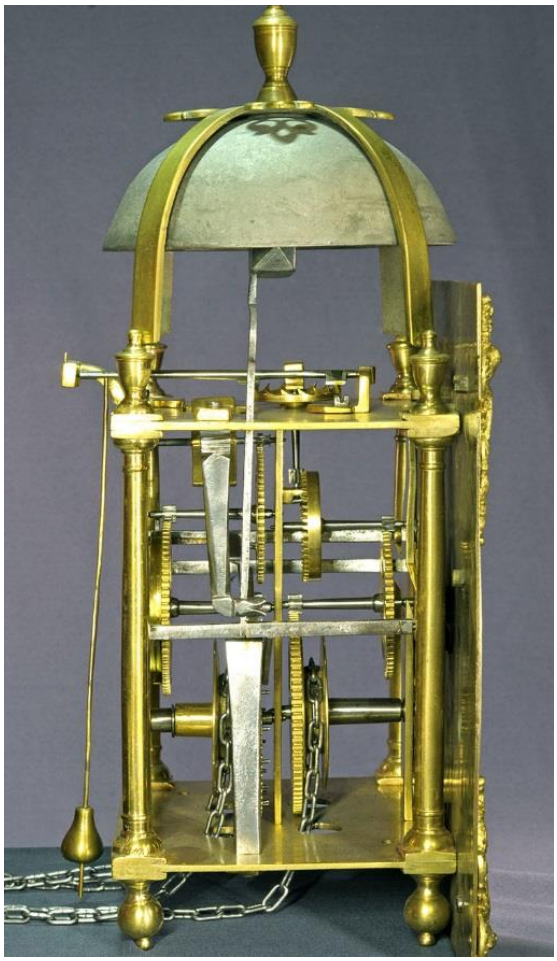

Figure 10 (left) – 17th century long case clock with short bob pendulum

Figure 11 (center) – sideview 17th century lantern clock illustrating the movement & short pendulum

Figure 12 (right) – later 17th century long case clock with anchor escapement