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## Revealing Skeleton Clocks

By Mark Frank  
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When most people think of an antique clock, they see an image, perhaps of a wooden-cased grandfather-style clock, or one of the many black slate mantle clocks that adorned the homes of many of our parents and grandparents. However, there was a small subset of antique clocks that were designed to be seen without an external case in order to display the movement as completely as possible. It would not be sufficient to simply pull an ordinary movement from its case and display it under a glass dome. Conventional movements have their wheels between two solid plates, not much to look at. So to make the clock visually interesting, the plates themselves are cut out, sometimes referred to as "fretting," to allow one to see through the plates and further reveal the clockwork within. When this is done for the sake of the clock movement itself being seen without any external conventional case, it is called a "skeleton clock," and the clock plates are referred to as "frames."



**Photo 2: Samuel B. Gaze, England, c. 1830, 13 inches high.**



**Photo 1: John Bennet, England, c. 1870, thick (7/8 inch), massive gilded, cast-brass plates with deep scrollwork carving, polished edges and interior stippling, 24 inches, 75 lbs.**

Often, this fretwork took on fanciful designs, from the organic and curvilinear ivy leaf to the angular architectural styles based on famous public buildings or churches. Usually, the focus of the clock is on the fretted frames. These could become so elaborate as to nearly obliterate the wheels' works between them, to almost the same degree as would conventional solid plates (photo 1). On rare occasions, the frames were minimized and their design pushed into the background as far as possible to allow the wheelworks to come to the fore (photo 2). Sometimes, the balance between frame and wheelworks were completely harmonized (photo 3). There are even completely unusual mechanisms where the clock is only a part of a larger structure (photo 4). Others have used unusual materials like cut rock crystal for the wheel hubs (photo 5).



**Photo 4: Unknown maker, England, c. 1890; an orrery containing numerous celestial indications and continuously driven by a detent chronometer clock, 14 inches in diameter.**

Aside from the very early domestic iron clocks of the 15th century and the English lantern clocks that followed in the late 17th and into the 18th centuries which showed the internal movement simply to save on materials, the first true skeleton clocks created solely for the purpose of displaying the internal mechanism began in France in the mid 1700s. It wasn't until the Industrial Revolution was in full flower during the Victorian Era from roughly 1830 through 1900 that the skeleton clock became widely popular, especially in England.

Several manufactories, largely located in the Clerkenwell area of London, produced a great many varieties of skeleton clocks to fit all manner of household budgets of the day. The newly introduced machine tools allowed for the semi-automated process of making what would otherwise be a very time-consuming and expensive product if made entirely by pre-industrial methods. The people who bought them looked upon these as examples of the Modern Era's industrial prowess, similar to the other mechanical marvel of the day, the steam engine.

For the more upscale, expensive and complex skeleton clocks, the customer could order their clock with all manner of "options" from a retailer's catalog, not unlike the way one orders an automobile today from the dealer's showroom floor. For example, one could have silvered appliques adorn the frame. The various



**Photo 3: James Condliff, England, c. 1860, 17 inches high. A replica of it has been made by J. Zygowski.**



**Photo 5: James Edwards, England, c. 1840, cut crystal wheel hubs, 16 inches high.**

components holding the wheels and fly fans could either be cut out from a solid form or have that same part also fretted within the interior of the part (photo 6).



**Photo 6: Smith of Clerkenwell, England, c. 1850, ivy leaf design. Complex quarter-striking clock with four-tune music box tripped automatically six times per day.**

The other major country to produce skeleton clocks at the time was France. There, things were quite different. The general public did not take such a great fancy to skeleton clocks as did their counterparts in England, and so, the production was far less prolific and aimed at a more exclusive clientele. The quality and materials were generally better than in England and further reflected what one might have expected in the Pre-Industrial Era. These clocks were also adorned, as is often the custom in French clocks, with elaborate enamel dialing and ormolu embellishments which also added to their cost. French skeleton clocks are highly valued today, (photo 7).

For many years, skeleton clocks were largely shunned within the horological community. It was not until F.B. Royer-Collard published his *Skeleton Clocks*<sup>1</sup> in 1969 to be later followed on by two books<sup>2</sup> by Derek Roberts in 1987 and 1989 that collectors began to take notice of these masterpieces of the art of clock making. Today, they are much sought after, and those examples that have rare complications (special features or functions, such as calendars, moon phases or astronomical functions) or display extreme skills in the presentation of the frame, dial or wheelworks command premium prices, some into the six-figure range.

In the Modern Era, there are still people who try their hand at demonstrating their skills at making a beautiful skeleton clock. One of the more complex skeleton clocks made in the 20th century was done by a country clockmaker, Paul Pouvillon, in France from 1918 to 1939, (photo 8). For the 21st century, I have commissioned



**Photo 7: Henry Lepaute, France, c. 1830, inverted pendulum design with day, date and month calendar, 29 inches high.**

a complex astronomical clock that has more than 350 wheels, 20 complications and is designed to entertain the viewer with an ever-changing range of movements throughout the mechanism (photo 9). It will be one of the most complex clocks made. One can follow the construction in real time at [http://www.my-time-machines.net/astro\\_index.htm](http://www.my-time-machines.net/astro_index.htm).

As with any other popular type of antique, one needs to guard against fakes. There are a great many modern copies of classic skeleton clocks coming currently from China, and there are a number of reputable firms who sell these as what they are: modern, low-priced and attractive decorative pieces. Over the years, the Chinese copies have become better, and unfortunately, unscrupulous resellers, especially within online venues like eBay, advertise these as antique. I've even seen some mainstream auctioneers who have "unknowingly" sold these as genuine antiques. Selling copies as authentic or antique is inexcusable as a careful look at the brass frames should show signs of the small casting flaws that were present in any cast frames made prior to the 1920s. Modern brass is mill-rolled and contains no such imperfections. Other signs to look for are a lack of wear on the pinions, dial surfaces and especially the screw heads. Any clock over 100 years old has probably been taken apart at least a few times for servicing, and the slots on the screw heads should show at least some distress from prior repairers. This is especially true if the screws have a blued finish. Finally, if the price seems too good to be true, it probably is!

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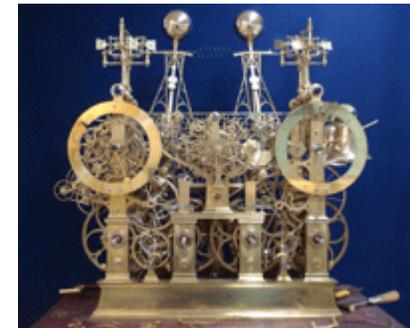
- 1 F.B. Royer-Collard, *Skeleton Clocks*, (N.A.G. Press Ltd., London, 1981)
- 2 Derek Roberts, *British Skeleton Clocks*, (Antique Collector's Club Ltd., Suffolk, 1987)
- 3 Derek Roberts, *Continental and American Skeleton Clocks*, (Schiffer Publishing Ltd., USA, 1989)

Mark Frank has been a collector of clocks for the past 20 years. His focus is on the theme of those clocks where one can readily view the mechanism. Skeleton clocks achieve this goal; tower clocks do the same on a much larger scale. He also restores and repairs clocks and tower clocks for his collection, and he engages in public speaking and writing on antique clocks. In 1983, he teamed up with Buchanan of Australia to create a complex fantasy clock mechanism that is due for completion in 2014 and will be one of the most complex clocks ever created. You can see some of his collection and contact the author through his website at: <http://www.my-time-machines.net/> .

All clocks, except 1 and 13, are from the author's collection. Height measurement is the clock without a dome.



**Photo 8: Paul Pouvillon, France, c. 1930, an extraordinary astronomical clock with more than 44 various indications. Considered the most complicated clock built for its size, 20 inches high.**



**Photo 9: Modern skeleton clock by Buchanan of Australia, currently under construction. Custom-built to the author's design with more than 350 wheels and 8,000 parts. Created to visually mesmerize through the use of movement and complications.**

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