

BULLETIN

Mar/Apr 2024
Vol. 66
No. 468

Journal of the National Association of Watch & Clock Collectors, Inc.



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Headquarters: 514 Poplar St., Columbia, PA 17512-2130 | 717-684-8261 | www.nawcc.org

Executive Director Rory McEvoy, ext. 209, rmcevoy@nawcc.org

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Managing Editor Laura Taylor, ext. 206, ltaylor@nawcc.org

Associate Editor Michael Schwartz, ext. 207, mschwartz@nawcc.org

Advertising & Programming Coordinator Amanda Mellinger, ext. 208, amellinger@nawcc.org

Designer Myra Beckman

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ABOUT THE COVER

The front cover features an Omega Constellation with the Megaquartz movement. This watch had an unusual frequency of 2.4 MHz and was certified as a marine chronometer. See Joël Pynson's article on the "Quartz Crisis" on page 120. Photo by Franck Ineichen.

WHERE IS TOMMY TICKER?

In each Bulletin, Mr. Ticker is hiding. If you find him, email editor@nawcc.org with your name and the page number and his location. Keen-eyed members and the location will be announced in the next issue. Entries are due by the 1st of the month before publication. Good luck!



MESSAGE FROM THE BOARD CHAIR

I hope all of our members had a wonderful 2023 and a great start to the new year. As Board Chair, I'm very proud of our organization's accomplishments last year and look forward to a fun and productive year ahead. To this end, all 12 members of the Board, our Executive Director, staff, and many member volunteers are hard at work to continue the progress begun in the past year.

One of the highlights for 2023 was our 80th anniversary of the NAWCC celebrated at the National Convention, held in Lancaster, PA, in July. As an organization, we not only showcased our incredible museum in Columbia, but we also provided members and prospective members activities related to all facets of horology. I am very excited about the work being done by the Convention Committee and look forward to continuing this momentum at our 2024 Convention, to be held in Chattanooga, TN, in June.

Over the past year, great work has been done at our Museum by the headquarters team and many talented volunteers. Updates were made to the public time gallery, the *S-Town Exquisite Clocks* special exhibit was created, and the first phase of a renovation of our Hamilton Watch Co. gallery was completed. For 2024 and beyond, many more exciting updates and exhibits are being planned. If you have not toured our Museum lately, I strongly encourage you to take the time to visit. You will not be disappointed.



The NAWCC is also hard at work on making improvements to our online presence, the School of Horology, and our publications. A recent change was made to this publication that combined the *Bulletin* and *Mart* into a single, higher-quality publication. My personal thanks go to our publications

staff, headed by Laura Taylor, for all the hard work in making this happen. In the coming months, we will be rolling out changes to our website and expanding our educational opportunities through the School of Horology.

As always, our continued success is dependent on the generosity of our membership. Your support, financially as well as through your participation at both the local and national levels, is critical to our future. If you're interested in learning how you can help, please contact headquarters, or feel free to reach out to any of our Board or National Committee members. Contact the Board by using the online form at nawcc.org/about/board-of-directors. National Committee members may be reached via the contact form on each Committee web page at nawcc.org/about/organization-contacts/#committees.

A handwritten signature in black ink that reads 'Rhett Lucke'.

RHETT LUCKE
RLUCKE@NAWCC.ORG

MESSAGE FROM THE EXECUTIVE DIRECTOR

Thank you to all who took the time to write in with your views on the new format for the *Bulletin*. Your response was overwhelmingly positive, and it is credit to Laura and her team for all the careful planning and attention to detail that has resulted in a more attractive, modern-looking, and engaging publication. One member was even inspired to write an article to be published in the updated journal! As mentioned in our monthly e-newsletter, I am particularly excited to see the Chapter Highlights appear with color photographs. We hope that this will inspire and generate more reports on Regional and Chapter events.

Seeing Tommy Ticker on the cover led me to dig a little into his background. He first appeared as a frontispiece in the 1873 book by James W. Benson, *Time and Time-Tellers*. Benson's book is a time traveler's delight, packed with references to time and time measurement in literature. He described many the types of watches and clocks that we now cherish as collectible antiques and provided details on his Great Clock that was displayed at the 1862 international exhibition. The book gives a strong hint of the Victorian sense that good time management and punctuality were more than just admirable etiquette. Timekeeping was inextricably connected to morality.

Anyone interested in this era might wish to explore Sarah Jane Stansfield's *Punctuality* (available on Google Books). This is a highly opinionated diatribe on the "slothful and careless; the street stroller, the intemperate man, the gambler; and many other characters . . . who do not only neglect this duty [being punctual], but deride it." The conclusion that all of the world's problems might be fixed if we could all be punctual may be naïve, but it gives us a fascinating glimpse into the world that many of our antique watches and clocks originally served.

To use Stansfield's language, we at HQ have not been "living riotously" and that we have been using our time and resources well to help improve the NAWCC experience. There are some exciting changes to our website that will make the process of renewing membership and donation

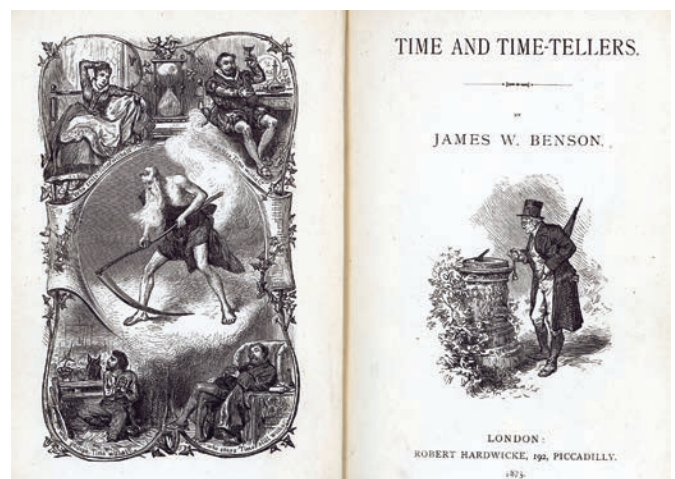


much easier than ever before. These seemingly minor changes are just the tip of the iceberg. Behind the scenes we are completely overhauling and updating our systems and software. As with the changes to the *Bulletin*, this is part of the ongoing effort to combat inflation and strengthen our

Association. The process of improving the School, Museum, and Library is ongoing, and I will update you on these projects as they develop in the coming year.

Once again, I would like to emphasize just how proud I am of our team and their proactive approach to the task of running the NAWCC. Thanks to their multiple cost-saving efforts, I can inform you that membership dues will not increase this year.

RORY MCEVOY
RMCEVOY@NAWCC.ORG



The “Quartz Crisis” and Swiss Watchmaking: Part 1

By Joël Pynson (FR) | Translated by Damon Di Mauro (MA)

Editor’s note: This article was originally published in Chronométrophilia in 2021 and has been revised and expanded by the author for publication in the Bulletin.

The term “quartz crisis” is often used to describe the troubles in the Swiss watch industry between 1975 and 1985. Wikipedia reflects a commonly held opinion: “It caused a significant decline of the Swiss watchmaking industry, which chose to remain focused on traditional mechanical watches, while the majority of the world’s watch production shifted to Japanese companies such as Seiko, Citizen, and Casio which embraced the new electronic technology.”¹

This topic has been discussed at length and has been the subject of numerous studies, most notably that of Cécile Aguilhaume.² More recently, in 2011, Pierre-Yves Donzé observed that Japanese manufacturers, headed by Seiko, did not build their success solely on quartz watches, since they mostly manufactured mechanical watches in the early 1970s. They also built on an industrial blueprint, through the mass production of quality watches, and on a conscious strategy of conquering markets, in particular the American market, which until then was the private preserve of the Swiss.³

Why then return to this topic? In recent years, a great many periodicals have posted their archives online, making it easier to conduct focused research over extended periods of time. *L’Impartial*,⁴ a newspaper based in La

Chaux-de-Fonds, Switzerland, and the *New York Times*⁵ in the United States are two notable cases in point. For this article, moreover, the Swiss trade press (*Journal Suisse d’Horlogerie* and *La Suisse Horlogère*) for the period in question was consulted, and the entire corpus of monthly editions of *La France Horlogère* magazine between 1969 and 1979 was examined. The purpose was to revisit some of the assumptions that might explain the sharp drop in Swiss watch sales from the second half of the 1970s onwards, as well as to try to draw a more comprehensive explanation for it.

THE FIRST WAVE: 1969-1974

THE STRATA OF THE SWISS WATCH MARKET IN THE 1970S

At the end of the 1960s, the Swiss watch industry supplied 80% of the world watch market in value (45% in volume). It employed 80,000 workers spread over 1,700 companies.⁶ Every segment of the market was under Swiss control.

The beautiful Swiss watch, primarily made in Geneva, had no competition. Prestigious brands such as Vacheron & Constantin, Audemars Piguet, and Patek Philippe reigned supreme in luxury watches, highly complex watches, and jewelry watches.

The quality-made, mass-produced Swiss anchor watch was recognized the world over. This success was based on healthy competition among Swiss brands, which vied with each other in technical innovation such as the

chronograph, the alarm watch, and the automatic watch. This success also derived from several other factors: continuous improvement in watch quality, reliability, and accuracy; a high-performance manufacturing base that had benefited from the protection of the Swiss Confederation, with the creation, for example, of the *ébauches* and *assortiments* trust; well-established and reliable distribution networks across the globe; and, finally, a streamlined after-sales service system, under the impetus of Ébauches SA and its supply network, which could send any spare part to any point on the planet within a few days.

The Roskopf watch, a low-cost watch with pin pallet escapement, occupied the final stratum of cheap watches, which was very significant in terms of volume. It stood up well to American competition (Timex), the only company that actually gave Swiss watchmaking a run for its money,⁷ thanks to a remarkable streamlining of its production, which was carried out on a massive scale in modern factories, and thanks to reliable, high-performance calibers despite the technical disadvantage.

THE THEN-EXISTING TECHNOLOGIES

It's worth remembering that the obsession of Swiss watchmakers at the time, and for decades, had been precision. A good watch had to be precise. And to measure themselves, there were the Observatory competitions in Geneva and Neuchâtel, as well as the institutes for official watch timekeeping tests in Le Locle, Biel, La Chaux-de-Fonds, Saint Imier, and Le Sentier. Successes in precision competitions were the subject of blaring headlines, though all brands came out ahead, since prizes and competitions were legion and foreign brands were not invited.

Without getting into technical details, it can be stated that in the 1960s watch precision was quite adequate thanks to the many improvements made to balance springs, oils, alloys, and manufacturing precision over the years. The factor that could further improve running quality and accuracy was the increased frequency of the oscillating system. This is what explains the technological advances that gradually appeared during this period.

The traditional lever watch had a frequency of 18,000 or 21,600 A/h (2.5 and 3 Hz). Chronographs and counters already existed with higher balance frequencies enabling measurement to 1/10th of a second, if not less. But mass production of high-frequency mechanical watches

required a capable escapement. Fabriques d'Assortiment Réunis was able to achieve this in 1966, introducing the Clinergic 21 escapement with a frequency of 36,000 A/h. First used by Girard-Perregaux, it was later adopted by a group of manufacturers brought together under the name Comité d'Horlogerie de Précision (Favre-Leuba, Eberhard, Cyma, Ebel, Ernest Borel, Doxa, Zodiac [Figure 1], Heuer, Juvénia) and by Longines.⁸ The accuracy reached was remarkable, at 2 seconds/day, and rivaled that of tuning-fork watches. The high-frequency mechanical watch was indeed the subject of an extensive promotional campaign by ASUAG in 1972.

The first industrial attempts to introduce electronics into wristwatches came from the United States and France, with the release of the first electric watches in 1957 and 1958, respectively, by Hamilton and Lip in collaboration with Elgin. Their frequency was no higher than that of lever watches, but they fostered in particular the development of miniaturized batteries to supply

Figure 1. A 1970 advertisement for a watch with a 36,000 A/h caliber.

Zodiac SST*36000
technique et ligne d'avant-garde

* Split Second Timing
automatique, jour et date, étanche

Garantie de précision
Zodiac SST 36000 bat 2 fois plus vite qu'une montre habituelle. 36000 fois à l'heure, 10 fois à la seconde. Elle atteint un tel degré de perfection que la fabrique en garantit la précision moyenne à ± 2 secondes en 24 heures.

La montre des sportifs
(les chocs n'affectent pas sa marche imper-turbable)
L'organe réglant, par ses oscillations rapides, est beaucoup moins sensible aux chocs qu'une montre à fréquence moins élevée. La SST 36000 a été choisie pour sa robustesse et la

sûreté de sa marche par des grands sportifs tels qu'Arthur Zartmann, champion du monde de hors-bord, et le skieur Bernhard Russi, champion du monde de la descente.

Elle "pense" à nombre de choses que vous pourriez oublier
La SST 36000 aime l'action : elle en a même besoin puisqu'elle se remonte d'elle-même à vos moindres gestes. De plus elle vous indique simultanément le jour et la date (rectifiée par simple pression sur la couronne lorsque le mois compte moins de 31 jours).

Zodiac

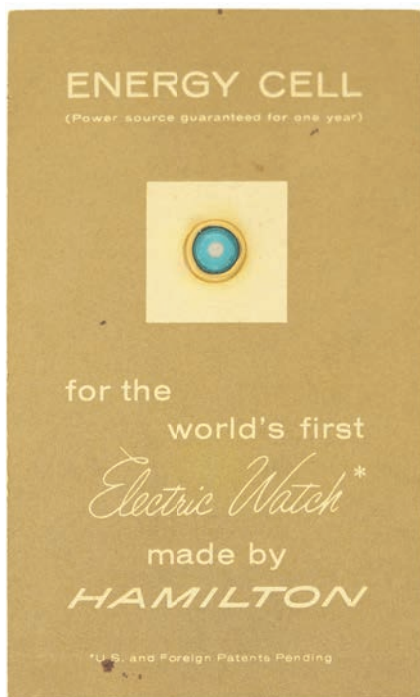
Zodiac, Le Locle, Suisse Fabricant des montres électroniques Modul-O-Quartz et Spacetric

energy (Figure 2). The electric watch met with limited success, and Swiss attempts in this field were no more encouraging (Dynotron). The Accutron tuning-fork watch, launched by the American company Bulova in 1960, had a different result. With a vibration frequency of 360 Hz, it guaranteed a precision of 2 seconds/day, or about 1 minute per month. At the time of its unveiling, it sold for \$175 to \$325, while the average price of a classic Bulova hovered around \$50. Yet the price soon dropped, and the Accutron proved so successful that it was even manufactured in Neuchâtel, Switzerland, from 1965 onwards. By 1968, Bulova had sold over 1 million Accutron. The threat became serious for the Swiss watchmaking industry, which chose collaboration rather than competition: Bulova and Ébauches SA signed a technology transfer agreement in September 1968,⁹ spawning the development of the Swissonic tuning-fork watch. In 1970, Bulova also signed agreements with Citizen in Japan for the production of tuning-fork watches.¹⁰

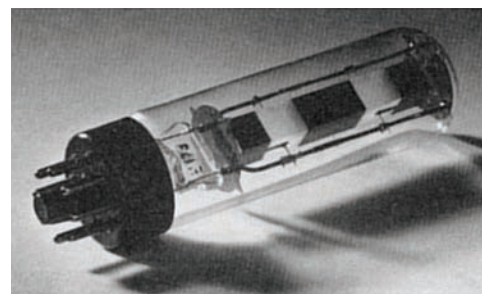
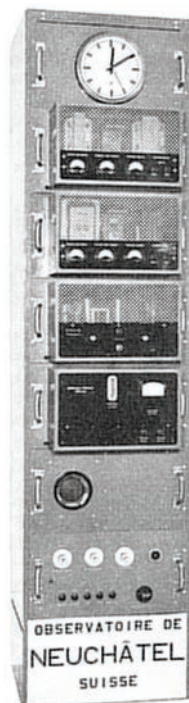
Quartz had even greater precision potential, since its vibration frequency could reach several tens of kHz. It was well known to watchmakers. As early as the 1930s, quartz clocks equipped physics laboratories¹¹ and observatories in Paris, Hamburg, Greenwich, and Washington. Their frequency ranged from 20 to 200 kHz, and their accuracy could reach a thousandth of a second/

day, prompting horological author Léopold Reverchon to say in 1939, "Today, it seems that quartz has found the gateway through which it will be allowed to enter the field of chronometry once and for all. It is therefore with good reason that we recommend watchmakers to keep an eye out without delay. And the right one."¹² The first quartz clocks were quite impressive. They were the size of a large wardrobe and required strict conditions of use: perfect size of the quartz crystal, placed in a vacuum, and strict temperature control, as quartz vibrations are very sensitive (Figures 3 and 4).

Over the course of the 1940s and 1950s, quartz clocks became more compact and were used by Swiss watchmakers to regulate their watches. They were also used for certain measuring instruments such as Longines's Chronocaméra or Omega's Time Recorder, developed for sports timing.¹³ Quartz became even more widespread with the development of the first quartz chrono-comparators, such as the Vibrograf from Reno SA or the Chronografic from Chs. Montandon SA, which became the benchmark for the evaluation of watches by watchmakers the world over. In 1949, Ébauches SA created its Oscilloquartz branch to research this technology. It was thus Oscilloquartz that supplied the quartz resonators later used in the first Swiss quartz watches.



◀ **Figure 2.** Hamilton's "energy cell." COURTESY OF THE NATIONAL WATCH & CLOCK MUSEUM.



▲ **Figure 3.** Vacuum quartz rod manufactured by Laboratoires Radio électriques SA, ca. 1948, as shown in *Journal Suisse d'Horlogerie*, 1948.

◀ **Figure 4.** Quartz clock at the Neuchâtel Observatory, as published in *Revue Internationale d'Horlogerie*, 1951. This clock was built by the Oscilloquartz department of Ébauches SA.

In 1952, Patek Philippe in Geneva designed a quartz clock that was far ahead of its time, with no hands and no wheels (Figure 5). The time was indicated by illuminated 12-hour markers and 60-minute markers.¹⁴

A further impetus was given to electronic watchmaking in Switzerland with the creation of the Centre Électronique Horloger (CEH), which was up and running in 1962. The effort devoted to the development of a quartz caliber by the CEH was considerable: nearly 90 engineers and 30 million Swiss francs (equivalent to \$136 million in 2023).¹⁵ The Beta caliber by the CEH was the product of a community of interest, made up of Swiss industrialists that included Ébauches SA, the Fédération Horlogère (FH), and numerous manufacturers such as Rolex, Longines, Jaeger-LeCoultre, Ebel, Doxa, Zenith, Omega, Enicar, and IWC.

The 1960s witnessed the arrival of the first quartz table clocks, in France in 1960 (Lip), Switzerland in 1961 (Ulysse Nardin in conjunction with Oscilloquartz), the United States in 1963 (Bulova, produced in Switzerland), Japan in 1965 (Seiko), and Germany in 1967 (Junghans).

Quartz marine and on-board chronometers were admitted to the chronometric competitions of the Neuchâtel Observatory in 1963, where they shattered



Figure 5. Patek Philippe quartz clock from 1952 in *Journal Suisse d'Horlogerie*. This clock has no wheels and no hands: markers light up on the dial to tell the time.

RECORD
A L'OBSERVATOIRE DE NEUCHÂTEL

Résultats du Concours de 1963
proclamés le 12 février 1964
Catégorie des chronomètres de marine

V = 1 dm³

1^{er} EBAUCHES SA NEUCHÂTEL

avec un nombre de classement jamais atteint
de 0,13 point - soit une précision de l'ordre du
centième de seconde par jour

En s'assurant ce résultat, Ebauches S.A. confirme sa connaissance des techniques modernes de l'horlogerie et de l'électronique. Grâce à ses performances, elle a été appelée à fournir les étalons-horaires d'expositions nationales et internationales.

Le garde-temps à quartz, primé à l'Observatoire de Neuchâtel, ne constitue pas une pièce réservée aux expériences de laboratoire. Il trouve des applications multiples dans l'aviation, l'armée, l'industrie, le marine, les chemins de fer, les usines électriques, l'horlogerie et la guidance.

Ebauches S.A., avec la même attention et des techniques ultra-modernes, produit dans ses 18 usines les pièces essentielles qui équipent 70... des montres soignées de qualité. Première à produire des ébauches de montres automatiques, en série, elle a été première aussi à créer une montre électrique suisse. Ses départements électroniques développent, pour les observatoires, les laboratoires scientifiques et les industries, des instruments et des appareils de très haute précision, tels que notamment : horloges à quartz, compteurs électroniques de tours, transformateurs de temps, récepteurs de signaux horaires, etc.

EBAUCHES SA NEUCHÂTEL
SWITZERLAND

Figure 6. As early as 1963, quartz chronometers were shattering precision records.

Figure 7. A 1971 Longines ad featuring watches with three different technologies.

LONGINES ULTRA-QUARTZ

La précision de la montre-bracelet cybernétique Longines Ultra-Quartz est quasi absolue. Elle est assurée par deux oscillateurs dont l'un asservit l'autre grâce à un circuit électronique de comparaison. L'oscillateur à quartz, très précis, corrige ainsi 170 fois par seconde la fréquence du moteur vibrant et la stabilise.

Les autres aspects essentiels de la Longines Ultra-Quartz sont: qualité, fiabilité, élégance, résistance, étanchéité et une autonomie de marche de plus d'une année.

LONGINES ULTRONIC

L'Ultronic Longines est équipée d'un diapason deuxième génération (résonateur de flexion à fréquence sonore avec un circuit électronique) ainsi que d'une partie mécanique. Grâce à cette conception modulaire, l'Ultronic est insensible aux champs magnétiques, aux chocs, aux accélérations et aux vibrations.

Ella est de ce fait très précise et étanche. En outre elle est dotée d'un calendrier et a une autonomie de marche de plus d'une année.

LONGINES ultra-chron Chronomètre

Les modèles Longines Ultra-Chron sont pourvus d'un résonateur « balancier-spiral » oscillant à 36 000 alternances/h, soit environ au double de la fréquence habituelle d'une montre. Cette particularité leur confère une plus grande précision et une résistance accrue.

LONGINES ADMIRAL

Complète la gamme des montres Longines Haute Fréquence. 4 formes originales de lunettes en acier et plaqué or, 9 cadrans de couleurs offrant ainsi un vaste assortiment de 36 modèles différents.

La conception technique du cadran ainsi que l'emploi de couleurs assurent une lisibilité parfaite et aisée jusqu'à la demi-seconde.

La nouvelle conception esthétique de la lunette alliée aux cadrans couleurs font de l'Admiral une montre résolument moderne.

Longines chronométré officiel aux Jeux Olympiques Munich 1972

records: Ébauches SA in 1963 and 1964, Voumard in 1965 (Figure 6). In that year, however, it was a foreign company that won the series prize for pocket chronometers: Seiko. And two years later, the same firm placed five quartz pocket chronometers in the top five spots! In the wristwatch chronometer category, the CEH presented its prototypes, which performed brilliantly in competition, just ahead of...Seiko.

On April 27, 1968, the Counsel of State suspended the competition in the "bracelet" category. The quartz watch had, in fact, become a reality in several countries.

A quartz watch was presented to the press by Longines in August 1969,¹⁶ but Seiko was the first to bring a quartz watch to market on Christmas Day 1969. It was a gold watch with a quartz frequency of 8,192 Hz, selling for \$1,250 (equivalent to about \$10,450 in 2023).¹⁷ The Swiss quartz watches (frequency of 8,192 Hz),¹⁸ produced by the CEH and presented at the Neuchâtel Observatory

competition in 1967, were prototypes, though the first watches equipped with the CEH's Beta 21 caliber were not marketed until 1970.

At the beginning of the 1970s, Switzerland was home to several cutting-edge technologies for the manufacture of modern watches. A very noteworthy example was presented by the Longines company, which offered the following in 1971 (Figure 7):

- High-frequency mechanical watches (36,000 vph) under the name Ultra-Chron
- Tuning-fork watches under the name Ultronic
- Analog quartz watches under the name Ultra-Quartz

Therefore, the Swiss watchmaking industry was not lagging behind technologically and was poised from the early 1970s to invest in any and all technologies that would be successful with the general public.



Figure 8. Quartz watches presented at the 1970 Basel Fair and appearing in the *Journal Suisse d'Horlogerie*. From top to bottom and left to right: caliber Béta 21, Girard-Perregaux Elcron, Longines Ultra-Quartz, and Omega Megaquartz.

This is what can be verified by examining the chronology of events at the beginning of this decade.

CHRONICLE OF EVENTS

This first period, from 1969 to 1974, witnessed a strong response from the Swiss watchmaking industry, which stepped up its investments and innovations. This was done in a chaotic manner, as competition was fierce between manufacturers and assemblers.

By 1970, there were five Swiss quartz watch technologies, each different from the other, evidence of considerable effort expended in a short period of time (Figure 8):¹⁹

- Longines²⁰ (Ultra-Quartz,²¹ in collaboration with Bernard Golay SA, 8,192 Hz)
- Girard-Perregaux (Elcron, in collaboration with Thomson, 8,192 Hz)

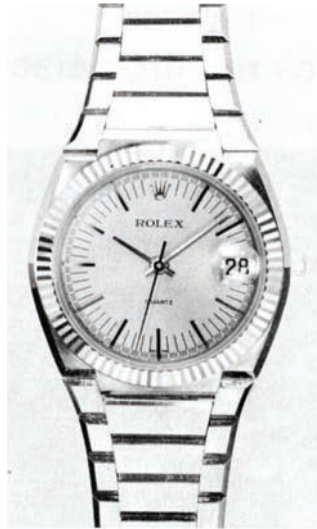


Figure 9. Rolex quartz watch, 1971, in *La Suisse Horlogère*.

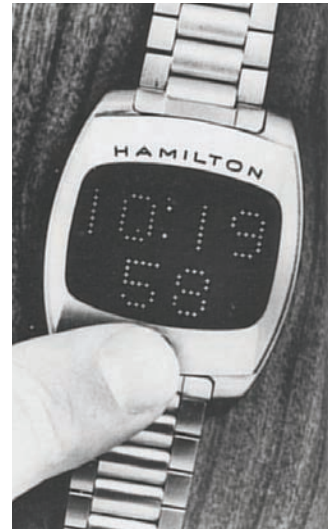


Figure 10. Hamilton Pulsar, the first quartz watch with an LED display, 1970, in *Journal Suisse d'Horlogerie*.



Figure 11. Second version of the Girard-Perregaux quartz watch, 1971, in *Journal Suisse d'Horlogerie*.

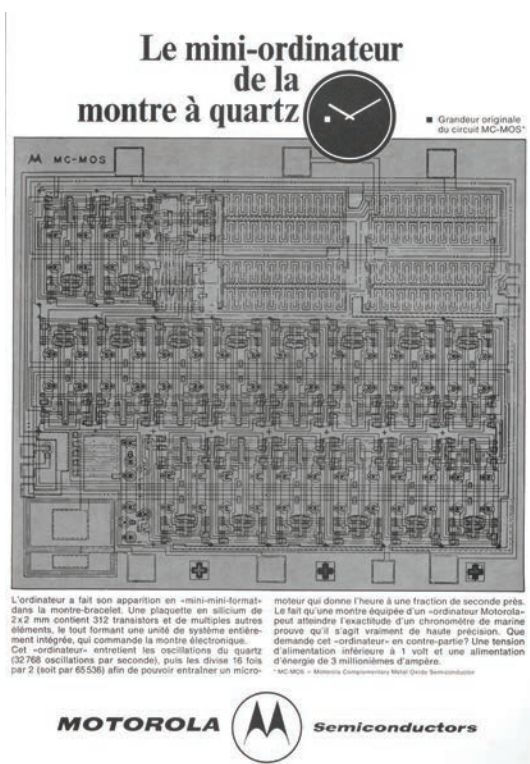


Figure 12. As early as 1971, Motorola offered its electronic technologies to Swiss watch manufacturers.



▲ **Figure 13.** View of Ébauches Électroniques SA in Marin, near Neuchâtel, in 1971, as shown in *La Suisse Horlogère*.



◀ **Figure 14.** Longines watch equipped with the Swisssonic 2000 caliber, 1972, in *L'Impartial*.

- Néosonic (participating firms: Büren-Hamilton, Certina, Roamer, and Rolex [Figure 9]), in collaboration with the Institut de Physique Technique de Zurich, 16,384 Hz)
- Omega (Megaquartz, in collaboration with the Institut Battelle in Geneva, 236 kHz)
- The CEH supplied its Beta 21 movement, at a rate of 500 per month and at the not inconsiderable price of 700 Swiss francs per unit (around \$2,500 equivalent in 2023), to numerous brands, which marketed it under their own name: Universal, Bulova, Cyma, Ebel, Enicar, Zenith, IWC, Eberhardt, Jaeger LeCoultre, Favre-Leuba, Juvénia, Doxa, Borel, Zodiac, Rado, Patek Philippe, and even Omega.

The CEH prepared for the future and signed a collaboration agreement on diode displays with an American firm.²²

In 1970, the first quartz watch with digital display was released: the Hamilton Pulsar (Figure 10), with LED display, developed in collaboration with Electro/Data²³ and sold in the United States for \$1,500 (\$12,500 equivalent in 2023). Quartz had a vibration frequency of 32,768 Hz, which gradually became the standard for quartz watches worldwide.²⁴ It was also in 1970 that the first French (Lip Exachron, Motorola circuits) and German (Junghans Astro-Quartz) quartz watches were announced, though they were marketed later.

In 1971, Girard-Perregaux introduced a second version of its quartz watch (Figure 11), with Motorola integrated circuits (Figure 12),²⁵ 32 kHz frequency, mechanical parts in collaboration with LeCoultre & Cie, and marketed at around 700 Swiss francs (\$2,500 equivalent in 2023).

Ébauches SA opened the Ébauches Électroniques SA center in Marin, near Neuchâtel, a vast complex that could accommodate 1,200 workers (Figure 13).²⁶ But there were two rounds of bad news: the Swiss franc was revalued by 7% and Zenith-Movado passed into American hands. SSIH (Omega-Tissot-Lémania) saved face by taking a stake in Hamilton.

It was also in 1971 that RCA (Radio Corporation of America) rolled out a watch with a liquid crystal display (LCD).²⁷ This had the advantage of the time remaining permanently displayed, whereas LEDs, which consumed a great deal of energy, appeared only briefly at the touch of a button.

Figure 15. Ditrionic quartz watches, 1972, in *Journal Suisse d'Horlogerie*.



In 1972, Ébauches SA fulfilled its role as the official supplier to the Swiss watchmaking industry by coming out with two quartz movements: the Swissonic 1000 (ESA 9170), a 32 kHz analog movement, and the Swissonic 2000 (ESA 9260), in collaboration with Longines, whose LCD display was supplied by Texas Instruments (Figure 14).

The number of firms producing quartz watches increased rapidly. In Switzerland, with astonishing speed, several firms introduced quartz watches with LCD display, even

Figure 16. The two types of quartz watches presented by Roamer in 1972, in *La Suisse Horlogère*.



though this technology had only been available for a year. The SGT group (Helvétia, Avia, Silvana, Titus, Sandoz), in association with its American subsidiary Waltham²⁸ and the electronics company Optel, offered a watch with LCD display for 650 Swiss francs (\$2,000 equivalent in 2023). The Ditrionic group (BWC, Delvina, Milus, Glycine, Wyler) unveiled its own versions at the Basel Fair (Figure 15).

Roamer then offered quartz watches with LCD display and, in collaboration with General Time Corporation,²⁹ with



Figure 17. Bulova quartz watch from 1972, whose quartz drove a tuning fork.

Le renom de Jaeger-LeCoultre: une garantie.

Une garantie aussi pour notre plus récente réalisation: la Master-Quartz.

Les maîtres-horlogers de Jaeger-LeCoultre aiment les idées révolutionnaires. N'ont-ils pas créé l'Atmos, cette extraordinaire pendule dont on dit qu'elle "vit de l'air du temps", parce qu'elle se remonte automatiquement par les variations de la température? La Memovox, la première montre ultra-précise munie d'une sonnerie?

Mais les chercheurs de Jaeger-LeCoultre ont une autre caractéristique: ils aiment pousser les idées très loin. Ainsi, on leur doit la plus petite montre du monde, un chef-d'œuvre de l'industrie horlogère.

Aujourd'hui, Jaeger-LeCoultre présente sa Master-Quartz. Ce n'est pas la première montre à quartz.

Mais elle atteint la qualité et la fiabilité que l'on attend d'une Jaeger-LeCoultre.

La Master-Quartz est pilotée par un cristal de quartz qui vibre 32768 fois par seconde. Or, plus on fractionne la seconde, plus la montre est précise! Un circuit intégré comprenant 312 éléments entretient et divise cette fréquence. Les aiguilles sont entraînées, par un moteur pas à pas de conception entièrement nouvelle.

Le résultat de ces performances techniques est une précision fantastique, que seuls le quartz et le savoir-faire de Jaeger-LeCoultre pouvaient vous assurer.

MASTER-QUARTZ

JAEGGER-LECOULTRE
marque déposée

Figure 18. Jaeger-LeCoultre advertisement for Masterquartz quartz watches, 1973.

Zenith XL-Tronic Quartz. Une minute au plus d'écart par an: sa précision tient les promesses de sa beauté

Les fabricants de sa haute précision... (text is small and partially illegible)

Les fabricants de sa haute précision... (text is small and partially illegible)

Les fabricants de sa haute précision... (text is small and partially illegible)

ZENITH

Zenith. Nous donnons l'heure et signons sa beauté.

Zenith Time SA - Bienne/Suisse - www.zenith.ch

Figure 19. Zenith XL-Tronic Quartz advertising, 1973.

analog display (Figure 16). It succeeded in bringing down the retail price to less than 300 Swiss francs (\$940 equivalent in 2023) by replacing the stepper motor with a spiral balance, which was well known to watchmakers. This was also the solution adopted by Corum, in collaboration with RCA and Bernard Golay SA, for its "µ Quartz" watch.³⁰

Production of quartz watches in Switzerland remained insignificant: 325,000 in contrast to over 70 million mechanical watches.

In 1972 in the United States, Bulova launched the Accuquartz (Figure 17), whose quartz drove a tuning fork, and, most importantly, Timex, a specialist in economical watches, offered a quartz watch at \$200 (\$1,450 equivalent in 2023), then in 1973 down to \$550 equivalent in 2023).³¹ Gruen followed suit with an LCD display watch at \$150 (\$1,000 equivalent in 2023).

In 1973, the quartz phenomenon gained steam. Jaeger-LeCoultre presented its analog Master-Quartz version (Figure 18), Synchron (Cyma, Borel, Doxa) also opted for analog (Stratoquartz 2000), as did Zenith (XL-Tronic Quartz; Figure 19), Mido, Favre-Leuba (Quartz Raider), Zodiac (Astroquartz), and Certina. Nivada opted for LEDs, and Nepro for LCDs (Figure 20). Fiercely independent, Omega had chosen an unusual frequency of 240 kHz

for its Constellation quartz, but in 1973 also developed a caliber with a more conventional frequency of 32 kHz (Figure 21).

Ronda, the independent specialist in low-cost movements, introduced its Ronda-quartz at an affordable price.

Oscilloquartz (Figure 22), a subsidiary of Ébauches SA, produced 1,000 quartz wristwatches a day, and intended to double its output in short order.³² Ébauches SA was developing an all-Swiss quartz caliber; the field-effect LCD display was developed with two Swiss firms: Brown Boveri and Faselec (Figure 23).³³

But production of electronic watches in Switzerland remained marginal: 650,000 out of 75 million. The dollar lost more than 10% against the Swiss franc.

It could be argued that a turning point took place in 1974. In that year, mechanical watches broke sales records (88.8 million watches and movements exported by Switzerland), which of course put into perspective the importance of the market penetration of quartz watches. This also led the Fédération Horlogère's Department of Economic Research to publish a voluminous study on the evolution of the cost of electronic watches. This study contained two errors that will explain the events that

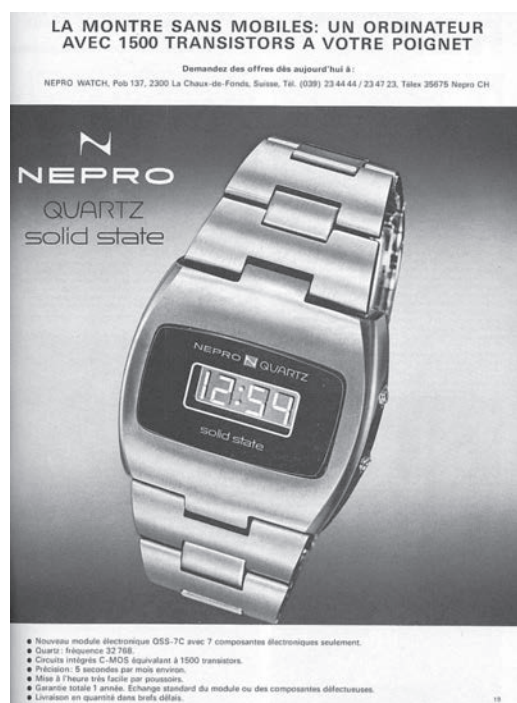


Figure 20. Advertising for the Nepro quartz watch with LCD display, 1973.



Figure 21. Omega chose an unusual frequency of 240 kHz for its quartz Constellation, but in 1973 it also developed a caliber with a more conventional frequency of 32 kHz. PHOTO COURTESY OF FRANCK INEICHEN.

Un pour tous.

Plusieurs calibres de montres électroniques sont équipés avec un seul et même quartz, qui est fabriqué en Suisse par centaines de milliers: le nôtre.

Cette longue expérience permet à Oscilloquartz SA d'offrir un quartz miniature à hautes performances. Ce résonateur oscille 32 768 fois par seconde (2¹⁵ Hz) et peut équiper indifféremment des montres bracelets électroniques hommes, dames et à affichage digital.

Ces quartz pour montres électroniques, fabriqués par Oscilloquartz SA, ont une très bonne stabilité à long terme et une excellente résistance aux chocs. Ces deux qualités ont une incidence déterminante sur les performances des montres.

Ces caractéristiques, alliées au prix d'un produit de masse, font de ces quartz une base de temps idéale, non seulement pour la montre, mais aussi pour tout autre instrument électronique.

Depuis 1949, nous sommes engagés dans la fabrication de quartz destinés à la mesure du temps.

Maison affiliée à Ebauches SA
OSCILLOQUARTZ SA
 CH-2002 Neuchâtel 2 Suisse
 Tél. 038 25 85 01, Télex 35 3115

Figure 22. In 1973, Oscilloquartz proudly proclaimed its manufacture of quartz crystals for electronic watches.

Elesta, premier fabricant suisse de circuits à couches épaisses pour l'horlogerie

Les avantages suivants ont poussés les horlogers à se tourner vers une nouvelle technique, les circuits à couches épaisses:

- Fiabilité améliorée (diminution du nombre de connexions)
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- Rigidité mécanique
- Résistances de haute valeur ohmique à très bonne stabilité
- Circuits testés à 100% par nos soins
- Prix avantageux

Nous tenons à votre disposition une documentation détaillée vous informant de façon plus précise sur les caractéristiques particulières de cette nouvelle technique. Prenez contact avec nous, nous vous assisterons volontiers dans l'élaboration de vos projets.

ELESTA
 Elesta Electronique SA
 CH-7310 Bad Ragaz
 Téléphone 085-9 25 55
 Telex 74 298

Elesta Electronique SA
 CH-1003 Lausanne
 rue Centrale 5
 Téléphone 021-22 03 96

Figure 23. In the early 1970s, several Swiss electronics manufacturers, including Elesta, ventured into electronics for quartz watches. This ad is from 1973.

followed: the underestimation of the electronics industry's capacity for innovation, and the underestimation of the speed at which this industry could bring its innovations to market. Among these innovations, most pertinently, was the ability to reduce costs. In this report, the tone was evident from the outset: "Indeed, it has been claimed that the cost price of the electronic watch would be considerably lower than that of its mechanical counterpart, whereas in the current state of affairs, the price of quartz alone is sometimes higher than the cost of a simple hand-wound timepiece."³⁴

The Fédération Horlogère neither believed in a reduction in the price of quartz ("the quality quartz that is already produced industrially currently costs around Fr.12-... but it seems unlikely that it will fall below Fr.10- in the foreseeable future"³⁵), nor in a reduction in the price of electronics ("the C-MOS circuit used in liquid crystal

watches is much more complex...and its price cannot, according to experts, be reduced in the short term by more than a few percent"). The Fédération Horlogère then concluded that "there is a big difference between the wish expressed by some to see costs disappear, as if by magic, and the reality of a highly complex product: the watch."

In retrospect, it's easy to argue that the Swiss manufacturers' mistake was not to invest in the mass production of quality quartz watches. But which quartz watch in 1974? Analog? Solid State? LCD? Field effect? LED? C-MOS? A host of acronyms alien to traditional watchmaking terminology. Manufacture one's own quartz, like Omega or Ébauches SA? Join forces with American electronics specialists like Roamer, Ébauches SA, or Girard-Perregaux? What, then, is Swiss Made?

In summary, during the first period of the “quartz years,” the Swiss watchmaking industry demonstrated great agility and remarkable responsiveness. Working in a disorganized manner imposed by the very structure of this industry, companies explored the various technological options with manufacturers who wanted to retain control of their production, trusts that invested to meet demand, and independents eager for any association. At the 1974 Basel Fair, Swiss quartz watches were in every window. Nonetheless, facts are stubborn things: they weren’t selling very well.

Part 2 of the article will examine the coming wave of American competition on price, Japanese competition on quality, the devaluation of the dollar against the Swiss franc, and the arrival of a new competitor in Asia.

Acknowledgment

Swiss trade journals were consulted at the research center of the Musée International d’Horlogerie in La Chaux-de-Fonds, thanks to the team of archivists under the direction of Régis Huguenin, whom I could not thank enough for their warm welcome and helpfulness. Part of the MIH’s documentary collection is available online at The Watch Library: <https://watchlibrary.org/>.

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4. Available at <https://www.arcinfo.ch/pages/archives-d-arcinfo-l-express-et-l-impartial-437575>.
5. Subscription required: <https://timesmachine.nytimes.com/browser?searchResultPosition=0>.
6. *L’Impartial*, January 6, 1972, 1.
7. Russian production outstripped American production (20 million units vs. 19 million) but in very limited markets. Japanese production (21 million units) was essentially limited to its domestic market. In 1969, total Swiss production reached 72 million units.
8. *La Suisse Horlogère* (1967): 6, 36.
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11. *Journal Suisse d’Horlogerie* (1936): 7–8, 43–45.
12. *Revue Internationale d’Horlogerie* (1939): 9, 126–29.
13. *Journal Suisse d’Horlogerie* (1951): 1–2, 46–51.
14. *Journal Suisse d’Horlogerie* (1952): 9–10, 271–76.
15. *L’Impartial*, April 15, 1970, 23. Swiss francs were updated using the Switzerland Inflation Calculator website, <https://www.in2013dollars.com/switzerland/inflation/>. US dollars have been updated using <https://www.saving.org/inflation/>.
16. *L’Impartial*, August 21, 1969.
17. *The New York Times*, January 5, 1970.
18. This frequency of 8,192 Hz, lower than the 32,768 Hz that would later become the standard, is linked to the difficulties that initially existed in reducing the frequency to drive a ratchet wheel. This constraint meant that the quartz rods were quite long (nearly 24 mm). Advances in integrated circuits have facilitated downsizing and enabled the use of smaller crystals oscillating at higher frequencies.
19. *Journal Suisse d’Horlogerie* (1970): 3, 312–18.
20. The Longines Ultra-Quartz watch did not actually come onto the market until the following year. Its development, with the help of Bernard Golay SA, was complex, and few examples were built.
21. Some of the first Longines quartz watches bore the name Quartz-Chron.
22. *L’Impartial*, May 22, 1970, 31.
23. Electro/Data, founded in 1966 in Garland, TX, was already working on prototypes of solid-state quartz watches; see <http://oldpulsars.com/ElectroData.htm>.
24. Girard-Perregaux claims to have first used this frequency for its quartz watches. This is indeed the case for the second generation of Girard-Perregaux quartz watches, released a year after the Hamilton Pulsar. When contacted about this via their website, the company did not reply.
25. *L’Impartial*, January 20, 1971, 3.
26. *Communications Ebauches SA* (1971): 29, 6.
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28. *La Suisse Horlogère*, Edition Hebdomadaire (1972): 271.
29. *La Suisse Horlogère*, Edition Hebdomadaire (1972): 428.
30. *Journal Suisse d’Horlogerie* (1972): 3, 310.
31. Its frequency was very different from that of its competitors: 49,152 Hz.
32. *Journal Suisse d’Horlogerie* (1973): 6, 602.
33. *La Suisse Horlogère*, Edition Hebdomadaire (1973): 426.
34. *La Suisse Horlogère*, Weekly Edition (1974): 1479–80.
35. It will be Fr.1.50 in 1977!

About the Author

Joël Pynson, MD, ophthalmologist, has spent most of his career as an R&D and engineering manager in the field of eye surgery and contact lenses. He holds some 20 patents in this field. A watch enthusiast and collector, he has published numerous articles on the history of Swiss watchmaking and is the author of two books: *Le chronographe de poche Suisse*, published by Chronométriphilia/Simonin, and *Chronographs for Collectors*, published by Time to Tell.



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Magic Numbers

9.2B Hz, \$500, 97 years, and 1 Atomic Clock

By Michael Schwartz (PA)

Mike Bovarnick is one of the more significant people you've never heard of. The 97-year-old retired engineer lives with his wife, Ruth, in Seattle, where he spoke to the *Bulletin* about helping make something you've definitely heard of: the atomic clock.¹ More precisely, the world's first commercial atomic clock: the Atomichron. How the clock came to exist and the impact it did—and didn't—have on Bovarnick's life is a story worth knowing.

"I really think the company had no idea what they had bitten off," Bovarnick said. "I was the whole engineering department. I had an assistant, but that was it. I had been working on a hi-fi amplifier, and that wasn't going well."

"The company [Natco, short for the National Company Inc. of Malden, MA] had on its board a bunch of professors," Bovarnick continued. What the recently installed board of directors lacked in business acumen they more than made up for in audacity, as they took on the task of building the world's first commercial atomic clock seemingly without stopping to consider whether they could actually do it (Figure 1).

So that's how his bosses came to Bovarnick one day and told him to set the stereo aside and focus on a different engineering challenge: make something extraordinarily sensitive, complex, and precise that no one's ever made before.

Bovarnick became the project engineer for electronics on the breadbox, essentially a working model they could experiment on. In theory, he was part of a three-man

engineering team, but in practice he spent most of his time alone, working in a "garage-like facility. I think they had bought an old supermarket or something for us to work in," Bovarnick said.

"When I was first brought on, it seemed to me the whole scheme was getting the oscillator right," Bovarnick continued. "We needed an oscillator that would get us the magic number, 9192.63184 MHz." With little empirical data to draw on, it's impressive that their magic number was only off by .000000076% from the currently known cesium-133 transition frequency: 9,192,631,770 Hz.

"The scheme they had started out with used an oscillator that wasn't stable enough," Bovarnick recalled. "The problem was the original oscillator had to operate in the x-band with a very narrow q " and the original oscillator just wasn't up to it.

So they bought a new oscillator. "The best one we could find was from Bell Labs," Bovarnick said. If a single institution deserves credit for inventing the modern world, Bell Laboratories is surely in the running for that title. The research arm of AT&T, Bell scientists brought us the transistor, the solar cell, radio astronomy, and information theory, without which there would be no computers. The list of Bell achievements goes on, but tangents shouldn't, so suffice it to say they also made a darn good oscillator.

The x-band Bovarnick mentioned refers to frequencies in the microwave radio region of the electromagnetic spectrum, 7-11.2 GHz. His magic number target sits right

in the middle of this range. The “narrow q” refers to the very small margin of error Bovarnick and Natco (and all atomic clock makers) have when exciting cesium atoms. The mechanism that makes a glass shatter when a certain note is played at a certain volume is known as a resonant frequency. Everything, from wine glasses to cesium-133 atoms, has a resonant frequency. At that frequency they’ll jiggle; a little above or below that frequency, they’ll just sit there.

Bovarnick’s main contribution to the Atomichron and the modern world it heralded was developing what he called “the Synthesizer.” The Synthesizer’s purpose was to keep the beam tub—where the cesium atoms jump from one energy level to another—stable. Solving the stability problem was essential for the Atomichron to work, so Bovarnick set to work on that and only that. Six months later he had finished, and his Synthesizer brought practical atomic timekeeping within reach.

What makes cesium-133 useful as a timekeeper, that is, as a thing that ticks, is that its resonant frequency is so precise, so well known, and attended by another phenomenon. When cesium atoms are jigged approximately 9.1 billion times a second, its electrons jump from one energy state to another and fall back again. In this process, they release light that is measured to verify the accurate operation of the device.

An atomic “clock” then is a bit of a misnomer. With a few exceptions—including one you can see at the National Watch & Clock Museum (Figure 2)—looking at the front of an atomic clock may well tell you interesting information, but you’ll have to look elsewhere to find out what time it is. An atomic clock is best thought of as the most accurate pendulum possible, ticking away 9 billion times a second.

And the reason anyone should care about any of this was summed up pithily by the BBC:

Whenever you have a network operating over distance, accurate timekeeping is essential for synchronization. And the faster the speed of travel, the more accurate the timekeeping must be. Hence in the modern world, where information travels at almost the speed of light down wires or through the air, accuracy is more important than ever.

What cesium has done is to raise the standards for the measurement of time exponentially.²

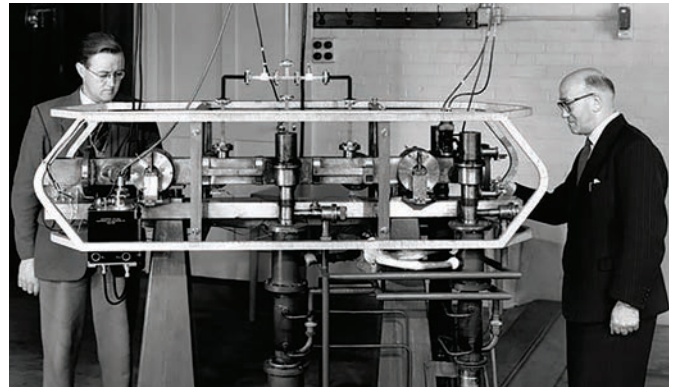


Figure 1. The world’s first cesium-133 clock was built in 1955 by Louis Essen (right) and Jack Parry (left) of the National Physical Laboratory in London.

This theory was more or less known to Mike Bovarnick, though understanding it didn’t really help him with the problem at hand. “Building the Atomichron was more of an engineering problem than a physics one,” he said.

Bovarnick and the Natco team spent all of 1954, 1955, and part of 1956 getting the Atomichron ready for prime time. Army, Air Force, and Navy labs placed orders for the first nine Atomichrons, an investment totaling \$360,000 that barely scratched the surface of the unit’s final development cost. The company found itself desperately short on cash, and the price of an Atomichron kept rising. When the program was first announced in January 1955, Natco said it would have clocks for sale later that year for around \$15,000. That figure had risen to \$50,000 by June.

When the team tested the first finished Atomichron, the results were disappointing and frustrating. At least at first.

“It was too stable,” Bovarnick said. “It was so stable we were all convinced we had to be wrong.” But they weren’t wrong; they had simply built a machine too exceptional for their skepticism to accept.

The Atomichron was publicly unveiled in New York in October 1956. Despite accruing a reliable operating history and having an accuracy and stability more than an order of magnitude greater than originally specified, the Atomichron could not save Natco. To avoid bankruptcy, Natco sold all of its Atomichron patents to Frequency Electronics in 1969.



Figure 2. The National Watch & Clock Museum's Atomichron, ca. 1962, catalog number 7715.4.

While today Bovarnick speaks of his work on the Atomichron with well-deserved pride, his feelings about his efforts and what Natco had achieved were a bit more somber when he was in the thick of it.

"I'm not sure people appreciated what we were doing. Civilians were used to buying 'atomic clocks' at pharmacies," Bovarnick said. "Atomic clock" was the colloquial term for radio clocks synchronized to a government time signal, broadcast continuously since 1945.

"I really feel now that it was a fabulous accomplishment, but I don't think I realized it at the time," he continued. "I was just so involved in the day-to-day every day."

When Bovarnick speaks about Natco, one pictures a company with an almost supernatural gift for folly. It had cornered the atomic clock market for five years and then managed to lose that advantage, selling its brand and assets way below cost a decade later. According to Bovarnick, "the company had no idea" what it was getting into.

Nevertheless, Bovarnick said he was a "happy camper" when the clock hit the market. He would have stayed at Natco, but the company managed to bungle that too.

"When I started, I was making a salary of \$7,000 a year," Bovarnick said. "We released the Atomichron and after demonstrating an accuracy of 10 to the 10th [about 1 second in 317 years], they gave me a raise of \$500." He paused. "That's when I started looking for another job."

A man with Bovarnick's talent and experience didn't have to look far. "A couple months later, I started at Boeing. Another good engineer becomes a lousy manager!" he joked, as his wife interjected in the background, "You were a good manager!"

Boeing must have thought Bovarnick had something to offer. "I worked in ballistic missile defense for 38 years," he said. Reflecting on his work on the Atomichron, Bovarnick uttered a far more revealing and personal statement. "I really think I made a contribution to the world," he said.

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By George Meyer (DE) and Burt Cifrutlak (PA)

INTRODUCTION

As avid collectors and horology enthusiasts, we are interested in areas that are often overlooked or cursorily examined. Our recent visit to the old Hamilton Watch factory during the NAWCC's 2023 National Convention in Lancaster piqued our curiosity. We observed the stark difference between the current clock towers and the engravings and photos depicting the original factory. This ignited our determination to delve deeper into the factory's history.

Some of the best agricultural land anywhere in the world is in southeastern Pennsylvania at the foot of the Appalachian Mountains. This area was part of the Penn's Woods charter of 1681 where many German-speaking people flocked to farm the land. It was here that the City of Lancaster was founded in 1742, laid out by James Hamilton.

The building at 917 Columbia Ave. housed every major Lancaster-based watch company, starting with the Adams & Perry Watch Co., founded in 1874, followed by



Figure 1. The Clock Towers Condominiums today, located on Columbia Ave. in Lancaster, PA. PHOTO BY MELONIE MURRAY.



▲ **Figure 2A.** This is the original line drawing of the factory by architect Clarence Luther Styles in 1874. It is marked "Drawn at Zahm's Corner" and depicts what was intended to be built. Shortfalls in initial capital prevented a clock and end cupolas from being completed. This artifact provided many answers to our early questions. COURTESY OF THE NATIONAL WATCH & CLOCK MUSEUM. PHOTO BY MICHAEL SCHWARTZ.

► **Figure 2B.** According to the Lancaster newspaper *The Daily Evening Express*, the cornerstone was laid on October 27, 1874, and was well attended by the community leaders, factory representatives, and the public. IMAGE COURTESY OF THOMAS CUNROD.

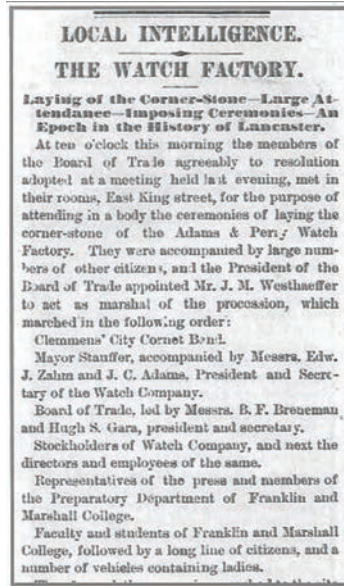


Figure 2C. The original Adams & Perry factory cornerstone with the date of "A.D. 1874" can be viewed today. PHOTO BY THOMAS CUNROD.

the Lancaster-named firms and the Keystone Watch Co., before concluding with its longest-lived tenant, Hamilton. Today, the former factory is known as the Clock Towers, a collection of 135 condominiums that earned a spot on the National Register of Historic Places in 1982 (Figure 1).

Beginning with the first factory building, designed and built in 1875, for the Adams & Perry Co., it was the company founders' intention to have a large tower clock to display the correct time. The plan included a clock tower and clockworks, with a four-sided dial facing the cardinal directions and visible to locals.

Despite this intention, no clockworks were ever installed until 35 years later when Hamilton installed the first one in 1910. Shortfalls in Adams & Perry's capital eliminated the proposed cupolas at each end of the factory wings. The central tower served as the main entrance for all employees until a second tower and entrance were added in 1916. Today the clocks are silent and do not work.

THE EARLY LANCASTER WATCH COMPANIES

ADAMS & PERRY

The Adams & Perry Watch Co. started humbly on June 19, 1874.¹ With no appropriate factory space available, the company operated from Edward Zahm's jewelry store in Lancaster's town square and used a portion of John Best's icehouse for machining operations.² Notably,

these spaces belonged to early local investors in Adams & Perry who had championed the start-up. Plans for a new factory were drafted in Zahm's store by Chicago architect Clarence Luther Styles (Figure 2A).³ Charles Augustus Bittner, a local investor and city council member, generously donated "free and simple" 3 acres on the town's west side for the new facility. This was farmland and required connections to the city's infrastructure, such as gas, sewer, and water lines, as well as road improvements. By the fall of 1874, construction began, supported by local investments and the backing of the Lancaster government and community.⁴ The cornerstone was laid with great fanfare on October 27, 1874 (Figures 2B and 2C).

The new factory was built for watchmaking, designed in the Empire style and adorned with a 90' tall clock tower, minus its clockworks and cupolas (Figures 3A, 3B, 3C). Attendees of the annual stockholders' meeting met there in June 1875. Challenges like economic downturns, poor managerial decisions, and not enough capital led to the downfall of not just Adams & Perry but also the half-dozen other companies that tried and failed to get a successful watch business started in that factory over the next 20 years.

Between 1875 and 1890, minimal upgrades were made to the factory, as the photograph in Figure 3D illustrates. The series of failed Lancaster companies depleted a modern equivalent of \$35 million, leaving the factory dormant until its assets were liquidated in 1892.⁵

Figure 3A. Pictured here is an engraved image of the original Adams & Perry factory designed by Clarence L. Styles, opened in June 1875. It has been published many times and was accepted as showing what the factory looked like. However, the clock face and wing end cupolas are drawn but were never installed due to shortfalls in capital. A drawing or engraving may not be reliable in showing what a building actually looked like. COURTESY OF GEORGE MEYER. **B.** This is the engraved image of the factory used on the stock certificates issued by Adams & Perry. There was no factory built at this time so in its absence the company used a modified engraved image of the Cornell factory. COURTESY OF GEORGE MEYER.

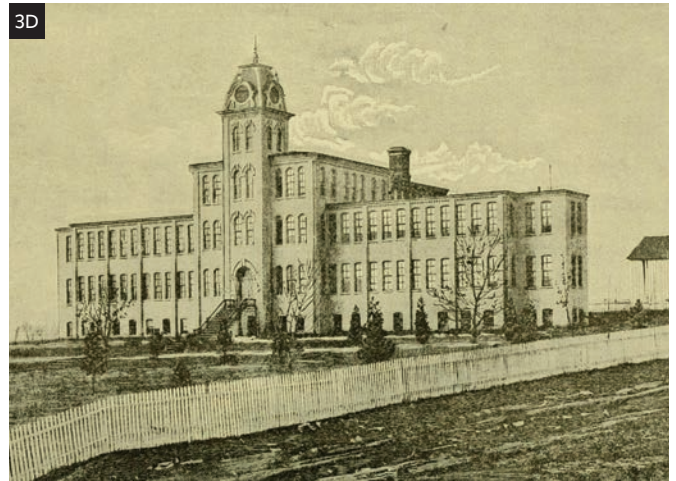


Figure 3C. Here is the engraved image of the Cornell Watch factory, which was started by John Adams and Paul Cornell in 1869. This is the image that was modified to represent the Adams & Perry factory on its stock certificates and leads us to conclude it was also designed by Styles. COURTESY OF GEORGE MEYER. **D.** Here is a very early photograph ca. pre-1890 titled "Keystone Watch Factory." There is no clock face or hands in the picture or cupolas at the building wing ends. As this is an actual photograph, it provides evidence as opposed to an artist's rendering in an engraving or drawing. COURTESY OF GEORGE MEYER.

In 1892, the factory and its contents were acquired at auction by Hugh M. North and local investors for \$6,000. Interestingly, these investors also acquired the Aurora Watch Co., a predecessor of Hamilton.⁶ A poignant remark in the *Jewelers' Circular and Horological Review*

aptly summarizes the challenges faced: "Starting a watch company is akin to launching a New York Daily—it demands substantial capital and resilience."⁷ Unlike the early companies, Hamilton would purchase its first assets for pennies on the dollar.

AURORA WATCH CO.

In 1892, the Aurora Watch Co. of Chicago, renowned for its high-quality products and good timekeepers,⁸ was sold at auction for \$50,000, a good bargain for the new owners. Charles Rood and Henry Cain, now in Lancaster, were the buyers. The initial founders dubbed their new venture Columbia Watch Co., but due to trademark conflicts the name was soon changed to Hamilton. Aurora's valuable assets, amounting to \$250,000, as well as its seasoned employees, played a significant role in Hamilton's success.

HAMILTON WATCH CO.

Commencing operations in June 1892, the Hamilton Watch Co. was officially open and named after the distinguished Philadelphia attorney Andrew Hamilton.⁹ John J. Bowman, writing for the Lancaster County Historical Society in 1945, stated, "Hamilton integrated the best of Keystone's assets with Aurora's machinery and personnel." By 1893, the factory expanded, adding a new extended eastern wing and introducing telephone service, a new jewelry room, and an oil house (Figure 4). By 1905, an additional floor was annexed to the main building, and the west wing extension added (Figure 5).¹⁰ A major change at the site occurred in 1909 when the original Adams & Perry tower was replaced with a new tower that extended the entrance and a new tower toward the south. The shape of the center cupola was also distinctively different. It was in that new tower that the first clockworks were installed (Figure 6). The second, or West, tower is visible in Figure 7.

Under the astute leadership of Charles Rood, Henry Cain, and John Perry, Hamilton very early on targeted the railroad industry with high-quality, jeweled watches. The company's motto—"The Railroad Timekeeper of America"—accurately reflected its dominance in the rail industry. With its products' success during World War I and as wristwatches for both men and women gained popularity after the war, Hamilton's production needs expanded. The company adopted a strategy of self-reliance and did not depend on other suppliers for support. The company was truly a self-sufficient operation with its own engineering department, metal labs and foundry along with a watch oil refinery, all of which gave it a competitive edge. All these combined efforts resulted in more watches sold, an expanded workforce, and the need for more factory space.



Figure 4. This is the earliest photographic image we have of the Hamilton factory ca. 1892. A Hamilton Watch sign was added over the east wing and expansion to the factory wings was made to accommodate the Aurora machinery. If you look closely, there are no hands and face where they should be. COURTESY OF GEORGE MEYER.



Figure 5. A ca. 1905 photo shows a fourth floor added to the original building, as well as extensions of the east and west wings. COURTESY OF GEORGE MEYER.



Figure 6. Here is a ca. 1909 view of the factory illustrating the new East Tower featuring a bumped-out center section and more fourth-floor additions. The first clock installed was a Seth Thomas no. 6 tower clock with electric winding. The clock boasted four 6' diameter illuminated dials. COURTESY OF GEORGE MEYER.

ILLINOIS WATCH CO.

Hamilton purchased the Illinois Watch Co. in 1927 and continued to produce the Illinois watches at the Springfield location until 1932. After 1933, all manufacturing of Illinois watches was moved to Lancaster, again requiring further expansion of the factory (Figure 8). Hamilton would continue using the Illinois brand until 1940, when those operations ceased.¹¹



Figure 7A. We can clearly see the second or West Tower in this ca. 1916 photo showing substantial expansion to support operations. COURTESY OF GEORGE MEYER.



Figure 7B. Here is the 1916 date marker that was placed on the new tower. PHOTO BY THOMAS CUNROD.



Figure 8. Another view of the factory, ca. 1930s, where you can see the two towers and considerable additional building space added to the west side, no doubt to accommodate the Illinois acquisition. COURTESY OF GEORGE MEYER.

FACTORY EXPANSIONS

In 1945, John Bowman added to this story, after “a glance through records of the Directors meetings,” noting continued expansions of the Hamilton factory, including a new tower and clock in 1909 with the expansion of the center section of the building, at a cost of \$6,566. This work required the old tower to be dismantled and a new tower and “bump out” of the building to the south. This clock would have a large 6’ diameter and illuminated dials. New office buildings and a rear addition were built in 1911 for \$16,138. Two more buildings were added in 1912, costing \$20,388.¹² Bowman does not address the major 1916 work of adding a second (West) tower. We know these expansions were done, as the building itself is marked with a date stone. Bowman does not give any details about further factory expansions until he writes of the final 1941 expansion.

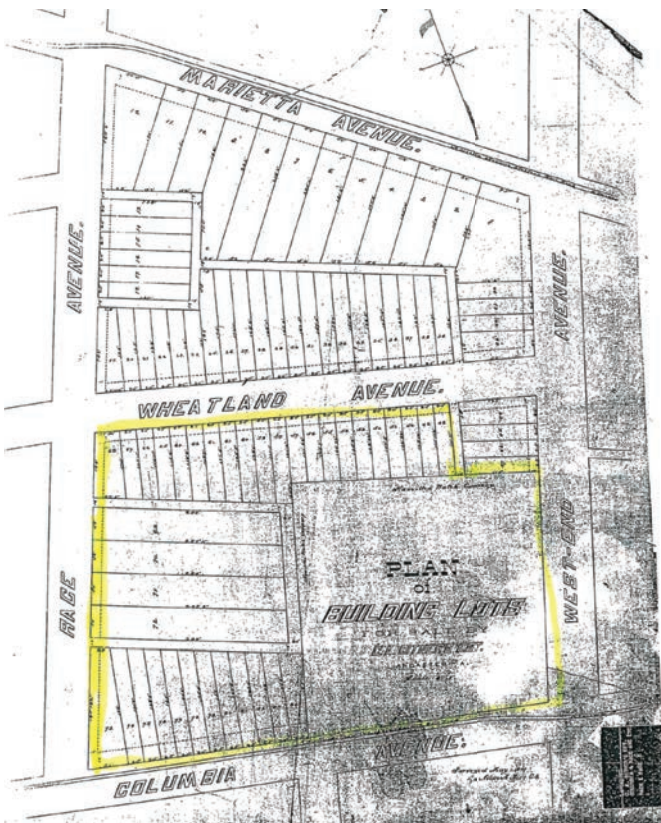
During World War II, Hamilton’s engineers, watchmakers, and workers made unparalleled contributions to the war effort, crafting some of the most impressive navigational timepieces ever built.¹³ The company’s war production resulted in the government procuring over \$31.5 million worth of quality watches, chronometers, and other time-recording instruments for the military. Hamilton established itself as a leader in quality military timing instruments and the ability to produce them quickly. These efforts required yet another major expansion of the factory, which was started in 1941 and cost \$425,000 (Figure 9).¹⁴ The facility continued to expand until 1963, with its final additions to the north of the main building (Figure 10).



Figure 9. Aerial view of the 1941 additions, showing how the factory grew in gigantic proportions compared to the original 1875 building. COURTESY OF GEORGE MEYER.



Figure 10. This ca. 1963 image shows what would be the final expansion of the Hamilton factory complex.



Hamilton's land assets greatly expanded from the original three acres donated by Charles Bittner to more than 13 acres to accommodate the factory expansions and increased parking area needed for employees (Figure 11). Hamilton purchased these additional acres from the Bitner family.¹⁵ South of the factory and across Columbia Avenue, an entire community was developed and was known as Bitnerville. Charles's gift of three acres turned out to be a pretty good investment for the family.



◀ **Figure 11.** This illustration highlights the original 3-acre gift that Charles Bitner donated to Adams & Perry in 1874, compared to the total 13 ½ acres the property would become after purchases from the Bitner family. COURTESY OF TOM CUNROD.

▲ **Figure 12.** Massive bank-type doors and heavy masonry construction were used in the factory to secure the valuable assets of the company. PHOTOS BY MELONIE MURRAY.

THE VAULTS

When reading about the vaults at Hamilton, our understanding was that they were merely rooms under lock and key. These were the locations where completed and nearly completed watches were stored prior to finishing and shipping. We were very surprised to learn that these rooms were actually heavy-duty masonry constructed and secured with bank vault-type doors. Several were built within the factory walls (Figure 12).

MYSTERY IN THE TOWERS

Today this historic building is home to the Clock Tower Condominiums and is well maintained inside and out. We were surprised and a little disappointed to learn that clocks in the factory towers are not operational. We also learned that the clockworks in the East and West Towers now contain what we believe to be second-generation electric clockworks. Thus began yet another mystery to investigate: if these clocks were not original to each tower, when they were first constructed in 1909 and 1916, what did they replace?

While attending the NAWCC 2023 National Convention in Lancaster, we visited the old factory and met Tom Cunrod there. Tom is a resident of the Clock Towers Condominiums and president of the Clock Towers Association. He is also the unofficial timekeeper and attends to the clocks located there. It was he who sent pictures of the present electric clocks and their related gearing, which started us on our search to discover what was there before, when the original mechanical clocks

were replaced, and who replaced them. A good first guess for when the change occurred would be in the 1940s or 1950s when many mechanical clocks were converted to electric. With very little information to go on, we posted a picture of the current clock and its connecting rods and universal joints on the NAWCC message board (Figure 13).¹⁶

Just when it appeared we had hit a stone wall in our investigation, we received a reply from an astute member of our message board, Greg Vasale, regarding the pictures we had posted there. The connecting rods and universal joints that remained in the East tower were identified as that of a Seth Thomas clock. With this information, we then checked the available Seth Thomas records of clock installations, available from the NAWCC. We discovered that a model no. 6 Seth Thomas mechanical clock with electric winding and 8' pendulum was purchased by Hamilton in 1910 and installed (Figure 14).¹⁷ This was the first clock to be installed at the factory site. The old tower had been torn down and then rebuilt in 1909. The present electric clock, now in the East Tower, was probably installed in the 1940s or 1950s, replacing the Seth Thomas.



Figure 13A. The electric clock mechanisms that now reside in the East Tower. It appears Hamilton reused the wooden cases of the mechanical clocks, which protected the movement from the environment of the tower. PHOTO BY MELONIE MURRAY. **B.** The West Tower electric clock was installed in 1940 as a replacement for the clock sent to Thaddeus Stevens College. This clock currently does not work. PHOTO BY TOM CUNROD.

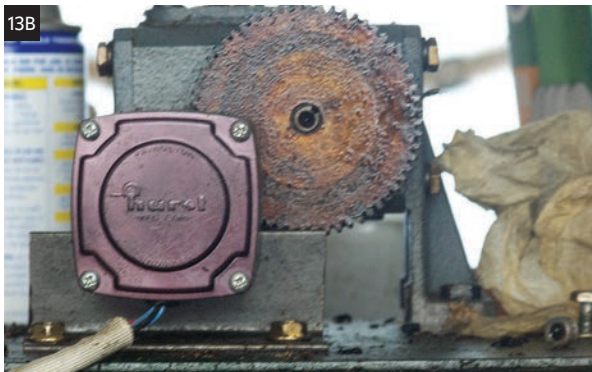


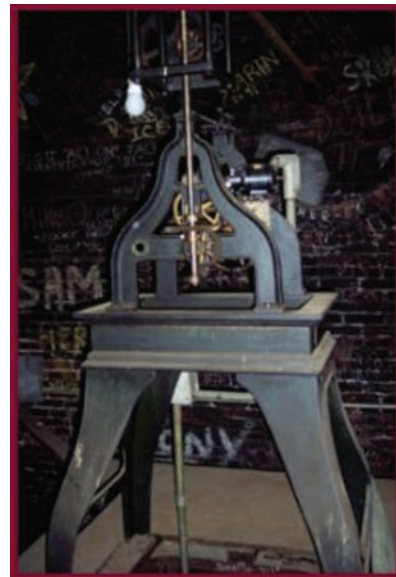
Figure 13C. In the East Tower, the wood case is still there, with the access door that protected and allowed the 8' pendulum to swing below the top floor of the tower room where the clockworks were mounted. There is no such case or provision for one in the West Tower. PHOTO BY MELONIE MURRAY.



Figure 14. A Seth Thomas no. 6 mechanical clock with electric winding at the National Watch & Clock Museum. This is the same type of clock that Hamilton purchased in 1910 for the new East Tower wing and factory entrance. It is a perfect fit for the wood box still in the tower. PHOTO BY MICHAEL SCHWARTZ.

Next we focused on learning more about the West Tower, constructed in 1916, and its original clock. Acting on a suggestion from Tom Cunrod, we directed our efforts to researching the history of Thaddeus Stevens College of Technology, founded in 1905 and located in Lancaster County. We learned that Hamilton supplied a clock to the college in early 1940 (Figure 15A).¹⁸ It appears that Thaddeus Stevens College intended to install a clock in its Mellor Administration building tower, but it would be many years before one was installed. We believe that clock, a Seth Thomas formerly at Hamilton, was modified from mechanical to electrical drive/mechanical (retaining the frame and some gearing) when installed at Thaddeus Stevens College. Connecting rods, universal joints, and other mechanical parts left in the Hamilton West Tower led us to this conclusion.

This historic clock was reportedly first located at New York City's Grand Central Railroad Terminal in 1902 (Figure 15B). This was the second of three terminals built, and when that building was being replaced in 1913 with the current structure, now named Grand Central Station, the clock was deemed to be incompatible with the new design of the building's facade. This was when the clock was acquired by Hamilton for its proposed new West Tower in 1916. In 1940, the current electric clock was installed by Hamilton and the old clock went to Thaddeus Stevens College. The clock in the West Tower at Hamilton today does not work. As amateur historians, we find the challenge of researching information from several sources to answer horological questions very gratifying.



◀ **Figure 15A.** Here is the Seth Thomas clock (now modified to electric drive) that Hamilton acquired from the Grand Central Terminal in 1913 and placed in its West Tower in 1916. In 1940 the clock was relocated to Thaddeus Stevens College of Technology.

▼ **Figure 15B.** New York City's Grand Central Terminal in 1902, clearly showing a four-sided clock.





Figure 16A. Getting to the tower clocks at Hamilton is difficult and can even be dangerous, requiring you to first walk across a portion of the roof. **B.** You must then climb through a tower window onto steps into the tower's first level. **C.** To access the second level, it requires a person to climb a steep ladder to access the clockworks.

PHOTOS BY MELONIE MURRAY.



GETTING INTO THE TOWERS

Accessing the interior of each of the clock towers is difficult, requiring you to step onto and then walk across a portion of the roof, perhaps encountering snow, ice, rain, or wind (Figure 16A). You then enter the tower through a window and descend four makeshift steps to the tower's floor (Figure 16B). Then you must climb up to the clockworks on the second floor by using a steep ladder (Figure 16C). The Seth Thomas mechanical 8-day clocks would have required weekly winding. We believe Hamilton's management would have done everything possible to avoid these precarious climbs by having more easily maintained electric clocks installed.

There is now a project underway to restore timekeeping at the Clock Towers Condominiums. The plan is to replace both clocks with new and more modern equipment, satellite controlled, which should ensure that once again they will display the correct time for many years to come.

CONCLUSION

The history of watchmaking in Lancaster, PA, is an interesting subject that we hope is now better understood and appreciated. The original factory saw the completion of Adams & Perry's watch, and later expansions gave Hamilton the space to build millions of watches, some of the best ever produced. Hamilton's efforts and production in the World Wars have no equal with any other watch company. Our intention with this article was to gather information and bring to light some perspective about the factory and how it developed over the years, and to answer the mystery of the clocks in the towers. The building fulfilled its purpose in accommodating thousands of skilled workers, many of whom spent their entire careers in watchmaking, and housing and protecting the important equipment that was required to produce timepieces of extraordinary quality. Hamilton collectors worldwide are fortunate to have such a historic treasure still standing proud, where each of their watch collectibles was manufactured proudly by expert craftsmen in Lancaster.

Acknowledgments

We can't begin to offer enough thanks to our new fellow NAWCC members Tom Cunrod and Melonie Murray, both of the Clocks Towers Association, for their great photography and enthusiastic efforts in Lancaster. We also thank Rhett Lucke for suggesting we write the article; the staff at Thaddeus Stevens College for helping us find information on their tower clock; Michael Schwartz, associate editor, for his pictures and help at the Museum; and certainly Laura Taylor, managing editor, and staff, for their combined assistance with publishing this article.

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About the Authors

George A. Meyer IV and Burt Cifrulak have coauthored several *Bulletin* articles on the history of early watchmaking companies of Lancaster, PA, and the watches they manufactured. They were each awarded the James W. Gibbs Award for excellence in literary achievement by the NAWCC in 2023 for their *Bulletin* contributions. They truly enjoy the challenge of exploring areas of horology that have been overlooked or recently investigated and then sharing that information with the collecting community. Both are proud members of the NAWCC and value all the friendships that they have made with fellow members over the years.

Keep the Clocks Running at the Old Hamilton Factory

The Clock Towers Condominium Association is selling memorial bricks to help fund the restoration of the two tower clocks. The bricks will become part of a new walkway at the foot of the East Tower.



Contact the CTCA at CTCA@comcast.net for details.



The Oldest Known Spring-Driven Clock with “Seconds” Indication

By Philip Poniz, NAWCC Fellow (NJ)

This article shows that even in horology, if it looks like a duck, swims like a duck, and quacks like a duck, it does not have to be a duck.

Figure 1 shows a magnificent clock, the only surviving example of the pre-1586 spring-driven timepiece with seconds indications. This clock has its own name, F2, which comes from the last private owner of the clock, Joseph Fremersdorf of Luzerne, who accumulated an impressive collection of early clocks. Most of them, including F2, are in Landesmuseum Württemberg, Stuttgart.¹ The F2's poorer brother, F1, is a magnificent clock on its own but with hours indication only. It has its own book, primarily due to its convoluted history, and is also in Landesmuseum Württemberg, Stuttgart.²

F2 is the most remarkable of a group of 13 or 14 highly decorated 16th-century table clocks called Orpheus clocks. The name comes from their decorations depicting the legendary musician Orpheus as he charms animals with his music (Figure 2). Besides showing hours, minutes, and seconds, the F2 clock has an annual calendar showing the date of the week, the date of the month, and the position in the zodiac. One of the rings shows seasonal occupations. The Orpheus clocks are so unique that a book has been written about them. The authors,

Philip Coole and Erwin Neumann, describe F2 in detail, even featuring it on the front and back of the jacket.³ They omit, however, its most curious feature.

The most unusual technical feature of F2 is its subdial at the top of the clock showing seconds. It is the earliest such feature on spring-driven clock that is known. The subdial is divided into 60 and marked every 5 seconds in Arabic numerals (Figure 3). The 2s in all indications, including the seconds track, are marked in Arabic (Figure 4). This is the first striking element of the clock. In all other Orpheus clocks, and in the majority of other German instruments from the period, the 2s are written as Zs (Figure 5). However, this is not the most surprising feature of the clock.

Let us examine the movement of F2. Figure 6 illustrates the going train and Figure 7 shows the escape (crown) wheel. It is easy to see that the minute wheel (the one with the minute hand) is driven directly from the fusee and has 60 teeth and drives a 10-leaf pinion of the intermediary wheel. The intermediary wheel has 62 teeth and drives the seconds wheel (the one with the seconds hand) of the 6-leaf pinion. The seconds wheel engages the contrate wheel set on the arbor of the escape wheel. It is an unusual construction, and I am not aware of another clock with such.



Figure 1. The magnificent F2, ca. 1560–70. COURTESY OF JÜRGEN EHRT, LANDESMUSEUM WÜRTTEMBERG, STUTTGART.

HOROLOGICAL HISTORY: FACT OR FICTION?

Figure 2. Decoration of F2 depicting Orpheus charming the animals with his music, plate 6 in Coole and Neumann's *The Orpheus Clocks*.



Figure 3. Seconds subdial of F2. COURTESY OF JÜRGEN EHRT, LANDESMUSEUM WÜRTTEMBERG, STUTTGART.



Figure 4. Part of the seconds track showing the Arabic 2s instead of the much more common Zs. COURTESY OF JÜRGEN EHRT, LANDESMUSEUM WÜRTTEMBERG, STUTTGART.



Figure 5. Part of the minute track from a clock from the second part of the 16th century. AUTHOR'S PHOTO.

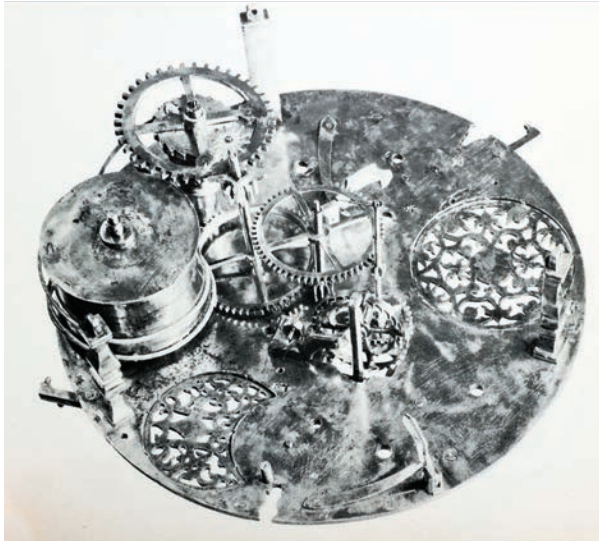
The seconds wheel and consequently the contrate wheel revolve 62 times in an hour, or 1.0(3) per minute. For the minute hand to make one revolution in one hour, the crown wheel (c) must be a divisor of 62 ($62/c=n$). For practical purposes, it must have 31 teeth. And it does. It is irrelevant how many teeth the escape (seconds) wheel has, provided its number is the same as the number of teeth of the contrate wheel. And they are the same, 30 each.

We just showed that the seconds hand does not revolve in one minute; it revolves 62/60 times in one minute. It does not indicate seconds, and simple math shows that its hand makes one revolution in approximately 58.06 seconds instead of 60 seconds. One division on the "seconds" dial corresponds to approximately 0.9677 seconds.⁴

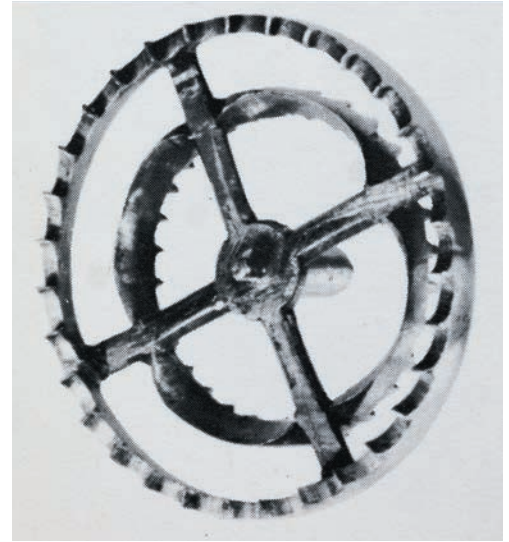
It is practically impossible that the maker made a mistake. Many clocks from the period with much more complicated gearings were perfectly calculated.

At the time, the accuracy of clocks was far from perfect. Among dozens of spring-driven Renaissance clocks I have restored or examined, only two performed with an accuracy of less than 10 minutes per 12 hours. Others ran at most 15 minutes per 12 hours and often over 20 minutes. No wonder why Tycho Brahe, in a letter to Wilhelm IV of January 20, 1587, warned him "Do not trust the Clock too much."⁵

Clearly, for longer time intervals, having seconds indication in such a clock did not make sense; its accuracy was in minutes, not in seconds. For short intervals, though, they could help. Brahe used to arrange his observations in such a way as to rely on his clocks with seconds as short as absolutely necessary.⁶



◀ **Figure 6.**
Going train of F2,
p. 83 in Coole and
Neumann's *The
Orpheus Clocks*.



▶ **Figure 7.**
The unusual
combination of the
crown and contrate
wheel placed on
the same arbor, p.
84 in Coole and
Neumann's *The
Orpheus Clocks*.

Had he seen this clock, he could not have relied on it even if it ran perfectly. The clock was not made for scientific purposes; it was made to impress. Most likely, the maker realized that the wheel driving the contrate wheel revolves in almost a minute and placed a seconds subdial there. Alternatively, he wanted to make a visually animated clock.

At the time, nobody would have noticed that it made a two-second difference in one revolution. Moreover, it seems that no one noticed it for the next half a millennium either.

One wonders in how many other early seconds clocks the seconds display did not display seconds. Sixteenth-century "precision" horology will be explored further in the next issue.

Acknowledgment

Special thanks to Jürgen Ehrt, conservator of the clocks in the Landesmuseum Württemberg, Stuttgart, for his photos and discussions about horology, horologists, and more.

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(London: Hutchinson Educational Limited, 1972). The authors were aware of nine such clocks; after the book's publication, five more were discovered. Three appeared at auctions (including a highly suspicious one in Bonhams, NY), one is in a private European collection, and one was destroyed (or stolen) during the bombing of Dresden during World War II, apparently unknown to the authors.

4. It is not possible to make a verge escape wheel revolving in 60 seconds. A verge escape wheel (the crown wheel) must have an odd number of teeth to work. One can make it to beat seconds but not in a 60-second dial. For a 30-second dial, yes.
5. "...non nimium fidus Horologio..." in, for instance, *Epistolarum Astronomicarum*, Uraniborg, 1610: 73.
6. F. R. Friis, *Tyge Brahe: En historisk Fremstilling* (Copenhagen, 1871), 129.

About the Author

Philip Poniz is a mathematician turned horological historian, collector, author, certified master watchmaker, and restorer. At seven years old, he took apart his first watch, sparking his passion for complicated mechanisms, including automata. Many of the world's ultra-complicated watches and clocks have passed through his restoration and forensic studio. His interests began with Renaissance clocks and watches, and he was very fortunate to examine and restore hundreds of them. Since then, he has embraced all complicated timepieces. His work ranges from being a court expert to a custodian of one of the largest horological e-libraries with over 8 million files. He is the manager of WatchInvest and the owner of European Watch & Casemakers. He moderates the NAWCC Complicated Watches Forum (mb.nawcc.org/forums/complicated-watches.427/) and has helped form several major horological collections.

American Clockmakers and Slavery to 1860: Part 2

By Mary Jane Dapkus, NAWCC Fellow (CT)

INTRODUCTION

Part 1 of this series traced the origins of slavery and antislavery in the US, the rise of the nation's slave-grown cotton economy, and the effects of slave insurrections in the American South, through the experiences of a number of clockmakers and peddlers. Part 2 begins by examining the rise of radical abolitionism in New England and how a few concerned members of the clockmaking community embraced the movement. It concludes with the singular story of a former clock casemaker whose experiences with clocks, slaves, and cotton began during the War of 1812 and continued in frontier Texas.

THE DISRUPTERS

Despite the nationwide prohibition in 1808 against importing captive human beings from Africa, by 1830 the slave population in the American South stood at 2 million and rising.¹ Although slavery had been abolished or was phasing out in Northern states,² some reform-minded individuals worried about the implications of the nation's growing dependence thereon and the escalation of racial prejudice, including in the North.³

The Declaration of Independence of July 4, 1776, states unequivocally, "We hold these truths to be Self evident, that all men are created equal, that they are endowed by their creator with certain inalienable rights...amongst these are life, liberty, and the pursuit of happiness."⁴

A free black man by the name of Benjamin Banneker (1731–1806) reminded the Declaration's author, Thomas Jefferson, of these words in a letter to Jefferson on August 19, 1791. By the time Banneker penned this unprecedented antislavery appeal (intending also to dispel Jefferson's flawed assumptions regarding the natural intelligence of black persons), Banneker had earned widespread fame as a self-taught astronomer, almanac maker, and the maker of a single remarkable clock. He had also served for a time as scientific assistant to Major Andrew Ellicott (1754–1820), during the latter's 1791 survey for the new seat of US government in Washington, DC.⁵

In 1816 a group of Northern reformers established the American Colonization Society. Its purpose was to transport free black settlers to Africa to establish a Christian mission, while at the same time ridding the US of what many considered an inconvenient free black population. In 1848, the names of Connecticut clockmakers Eli Terry [Sr.], E.[lisha] C. Brewster, Birge & Fuller, Z.[elotes] C. Grant, Noble Jerome, Elijah Darrow, and P.[orteus]

R. Ives appeared on the Society's donor list. Like them, many Southern planters also favored colonization, figuring it would remove a source of their slaves' discontent. The Society established the West African colony of Liberia; however, the few black persons who were sent there encountered little more than abject poverty and disease.⁶

In Boston in 1831, as fear of slave uprisings permeated the South, a young reformer by the name of William Lloyd Garrison (1805–79) (Figure 1) founded an antislavery newspaper called the *Liberator*. The newspaper ignited a national furor, as its uncompromising editor demanded not only immediate emancipation but also suggested dissolving the Union as a way of eliminating the Constitutional loopholes that allowed slavery.⁷ The *Liberator* proved so controversial that in Danvers, MA, passersby threw stones at persons soliciting subscriptions. Elsewhere, mobs attacked the homes of prominent abolitionists; Garrison himself was nearly lynched.⁸

In Danvers, MA, in 1831, tall-clock maker Ezra Batchelder Jr. (1769–1858) took one of the *Liberator's* earliest subscriptions. He was not, however, the only clockmaker who sided with the radicals. Having converted to the Quaker religion early in his career, for example, clockmaker and lay preacher John Bailey (1751–1853) of Hanover, MA, traveled widely in New England and the South spreading the abolitionist message. His son John Bailey Jr. (1783–1883) moved to New Bedford, MA, where he repaired ships' chronometers, tall case clocks, watches, and other horological items for an affluent seafaring clientele, all the while following in his father's avocation as a charismatic abolitionist speaker. The younger Bailey's antislavery stand, however, caused him to fall from favor with local elites who conspired to deprive him of his lucrative business. About 1848, he resumed the clock- and watch-repairing trade at Lynn, MA, amid a populous Quaker community that shared his antislavery views.⁹

FARMINGTON, CT, CLOCKMAKERS AND ANTISLAVERY

Despite the widening national division over slavery, a number of Northern clockmaking firms and their agents continued doing business in the South. At Plymouth, CT, Eunice (Terry) Richardson (1827–72), a daughter of clockmaker Eli Terry Jr., recalled two occasions on which customers brought their slaves to her father's factory to purchase and carry away clocks.¹⁰



◀ **Figure 1.** William Lloyd Garrison (1805–79), ca. 1870, albumen print photo.

COURTESY OF THE LILJENQUIST FAMILY COLLECTION OF CIVIL WAR PHOTOGRAPHS, LIBRARY OF CONGRESS PRINTS AND PHOTOGRAPHS DIVISION, [HTTPS://WWW.LOC.GOV/PICTURES/ITEM/2017660623/](https://www.loc.gov/pictures/item/2017660623/).

▼ **Figure 2.** Cowles, Deming & Camp, Farmington, CT, label in wooden movement shelf clock, ca. early 1830s. COURTESY OF THE FARMINGTON [CT] HISTORICAL SOCIETY. AUTHOR'S PHOTO.



Bitter division over slavery in the 1830s did not spare the town of Farmington, CT. However, through the efforts of a handful of its citizens, the town became one of the state's leading abolitionist centers.¹¹

In Farmington between 1832 and 1834, the clockmaking firm of Marsh, Gilbert & Co., succeeded by George Marsh & Co., rented part of a grist, saw, and wool-carding mill complex on the Farmington River, belonging to the firm of Cowles, Deming & Camp. A number of wooden-movement Marsh, Gilbert & Co. and George Marsh & Co. clocks with Farmington labels are known. In contrast, only a single wooden-movement shelf clock example has come to light that bears the name of Cowles, Deming & Camp. Its label is shown in Figure 2.¹²

At least three of the five partners in Cowles, Deming & Camp—namely Samuel Deming (1798–1884), James K. Camp (1784–1845), and Richard Cowles (1786–1845), all belonging to the highest echelon of Farmington society—were deeply committed to abolitionism. In 1836, Deming and a handful of other Farmington elites, including Austin F. Williams (1805–85) (the “Williams” in the Farmington [Unionville village] clockmaking firm of Seymour, Williams & Porter), were instrumental in founding the local antislavery society.¹³ By the 1840s, Deming and Williams also served as agents in the Underground Railroad, which undertook to transport fugitive slaves northward toward freedom in Canada.¹⁴

In 1835, Austin F. Williams helped organize a program by a noted clergyman and representative of the American Anti-Slavery Society, Amos A. Phelps (1805–47). Scheduled to take place in Farmington on December 15, Phelps’s speech was interrupted when 20 or 30 angry white men smashed windows and a lamp, then entered the building intending to break up the meeting by force. Sympathetic persons whisked Phelps to safety.¹⁵

In the presence of several witnesses on the following day (December 16, 1835), New York City merchant and fellow Farmington resident Abner Bidwell (1785–1880) physically assaulted Austin F. Williams “with great force and violence.” It is reasonable to believe the assault had something to do with the latter’s antislavery activism. Despite his plea to the contrary, a jury found Bidwell

guilty. On appeal he was sentenced to pay a \$1 fine to the town of Farmington’s treasury.¹⁶ Nevertheless, on January 13, 1836, 200 Farmington residents gathered to express their opposition to antislavery associations.¹⁷

Aside from the lack of universal support for abolition, some local residents, including a few clockmakers, found slavery expedient while working in the Southern states. When, for example, Joseph R. Gillett of New Hartford, CT, and Frederick P. Hall of Farmington commenced a partnership in July 1835 for the purpose of selling clocks in Alabama as a subsidiary of their manufacturer, Seymour, Hall & Co. of Unionville village, Gillett and Hall acquired “one slave, Horses, Waggon, clocks, harness & divers other articles of visible personal property in Alabama,” valued at a total of \$4,600.¹⁸

On February 28, 1838, Richard Cowles, Austin F. Williams, Samuel Deming, and fellow Farmington resident Henry C. Bull (the latter, as we will see, a silent partner in the clockmaking firm of Williams, Orton, Prestons & Co.) attended a convention held in Hartford, CT, marking the establishment of the Connecticut Anti-Slavery Society. On that day, Cowles and Deming were elected to the society’s executive committee; Austin F. Williams was appointed one of its managers.¹⁹

The Connecticut Anti-Slavery Society published the premier issue of its newspaper, the *Charter Oak*, in March 1838 (Figure 3). In the same year, Plymouth, CT,

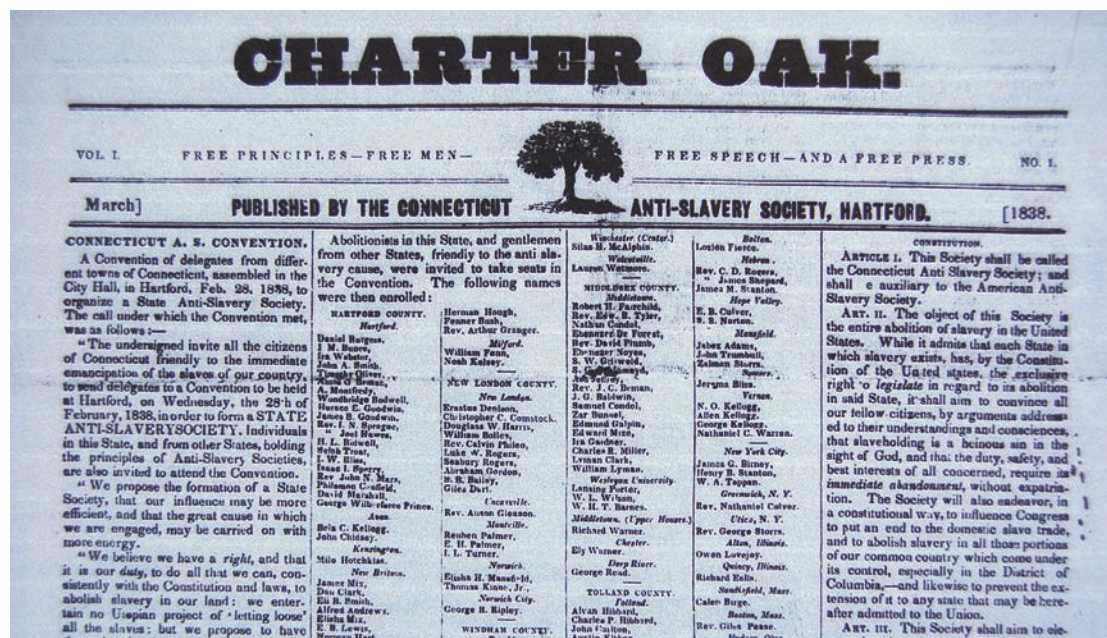


Figure 3. Banner portion of page 1 in the premier issue of the Connecticut Anti-Slavery Society’s newspaper, *Charter Oak*, March 1838. COURTESY OF THE CONNECTICUT STATE LIBRARY. AUTHOR’S PHOTO.

clockmaker Henry Terry (1801–77) served as the paper’s agent for Plymouth Hollow, and Ezekiel Birdseye (1796–1861) served as its agent for his native town of Cornwall.²⁰ This was quite likely the same Ezekiel Birdseye who was a partner in the clock-sales firm of P. Barnes & Co. (1821–ca. 1830), together with Philip Barnes of Great Barrington, MA (a former slave owner) and Rensselaer Upson of Bristol, as described in Part 1 of this article.

Perhaps no other maker of American wood- and brass-movement shelf clocks of the 1830s and 1840s possessed stronger ties to the antislavery movement than Farmington’s Williams, Orton, Prestons & Co. On June 14, 1838, Noah Preston (1800–45), Henry C. Bull (1812–85), and Heman H. Orton (1804–56), three of the firm’s founding partners, together with Noah Preston’s brother John S. Preston (1808–?)—another early partner in the firm—became *Charter Oak* subscribers.²¹ Austin F. Williams (who was not the “Williams” in Williams, Orton, Prestons & Co.) took six copies. As the agent of his politically active father-in-law, Timothy Cowles (1782–1858), Austin F. Williams was then struggling to wind down the contentious affairs of Seymour, Williams, & Porter and its successor firm, Seymour, Hall & Co.²² Other Farmington subscribers to the *Charter Oak* included Samuel Deming and James K. Camp of the firm Cowles, Deming & Camp, with clock connections mentioned above.²³

Remarkably, the above-mentioned subscribers’ signatures, except for John S. Preston, plus the signatures of several additional Farmington clockmakers, including Frederick [W.] Crum (1813–95), Levi Smith (1807–80), and Isaac P. Frisbie (1809–73), are found on one or more highly controversial petitions to Connecticut’s General Assembly made by Farmington residents during 1838. The petitions supported measures aimed at eliminating “distinction among...[the state’s] inhabitants on account of color;” prohibiting the admission of new slave states to the Union; abolishing the slave trade in Washington, DC; prohibiting the interstate trade in slaves; mandating trial by jury for fugitive slaves; and preventing the annexation of Texas (a recently formed independent republic with legalized slavery) to the Union. Several clockmakers, including Henry C. Bull and Heman H. Orton, signed all of them.²⁴ Although the state legislature neglected to act on the petitions,²⁵ their signatures attest to the men’s courage and foresight in these matters.

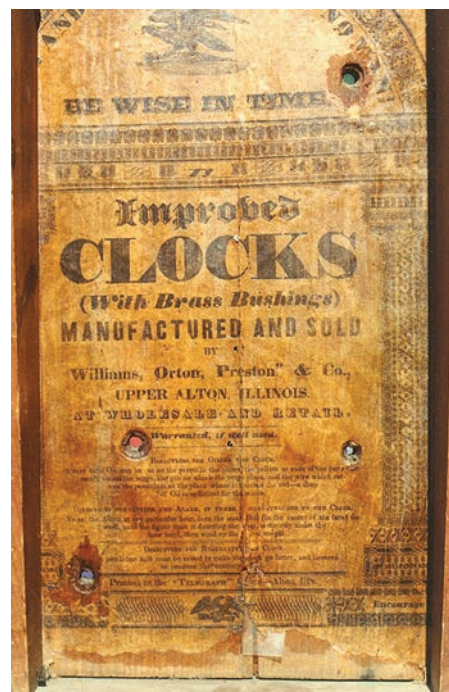
In 1839, Williams, Orton, Prestons & Co. partner Henry C. Bull moved from Farmington to Alton, IL, where he

managed the firm’s clock assembly and sales branch. Figures 4A and 4B illustrate an example of an Alton-labeled clock, with the label’s use of the singular possessive form “Preston’s” (with the final “s” in superscript) reflecting Noah Preston’s expulsion from



4A

Figure 4A. Exterior view of a 30-hour wooden movement shelf clock by Williams, Orton, Preston’s & Co., Upper Alton, IL. **B.** Label of the clock shown in Figure 4A. COURTESY OF THE LATE CHRIS BROWN. AUTHOR’S PHOTOS.



4B

the partnership in 1842. The story of Williams, Orton, Prestons & Co.'s ill-fated Illinois branch has been told elsewhere;²⁶ for present purposes, let it suffice to say that, given the antislavery views of the firm's partners, the decision to set up an assembly plant in Illinois may have had something to do with it being a free state.

In 1840, Austin F. Williams became active in the formation of a national abolitionist political party known as the Liberty Party. In 1841, Samuel Deming and Austin F. Williams brought to Farmington the freed African natives who had commandeered the slave ship *Amistad*. Deming provided shelter for the *Amistad* mutineers (famously acquitted by the US Supreme Court of any crime in the matter) in his store, located "at the corner of Main Street and Mill Lane,"²⁷ in close proximity to Cowles, Deming & Camp's mill, the site of clock production in Farmington village some seven years previously.

The antislavery movement slowly gained ground in Farmington and elsewhere in the North. In 1847, the last active year for the clockmaking firm Williams, Orton, Preston's & Co., the town of Farmington voted narrowly in favor of black suffrage, well ahead of the change in Connecticut state law in 1868 and well ahead of most other towns in its demonstrated concern for the nation's black inhabitants.²⁸

A CLOCK CASEMAKER AND HIS CONNECTIONS WITH SLAVERY

EARLY YEARS

The story of Zenos Bronson²⁹ illustrates how one former clock casemaker navigated the slave economy. Although Bronson's genealogical origins remain a mystery, it is certain that by 1812 he was an experienced cabinetmaker quite familiar with the cabinet and clock casemaking shops of Hartford and Waterbury, CT, and their personnel.³⁰

On June 22, 1812, Bronson appeared in the extant accounts of the Waterbury, CT, wooden tall clock movement-making firm Lamson, Sperry & Co., as the purchaser of "74 D[ay] Month Clocks" (evidently uncased movements), for a total of \$74.³¹ By November 1812, Bronson was in Mecklenburg County, VA, setting up a furniture and clock-casemaking shop in partnership with William K. Lamson (1774–1832) of Waterbury, the "Lamson" in Lamson, Sperry & Co.³²

Bronson set up a cabinet shop in Mecklenburg County and a branch in Raleigh, NC. Unable to pay his debts in the spring of 1815, however, he fled, leaving a trail of creditors and their lawsuits in his wake. In one such suit, plaintiff Thomas Cobbs explained to the Mecklenburg County Chancery Court that Bronson left some property "sufficient probably" to cover his debt to Cobbs as well as to the keeper of a local general store. This property was in the hands of Bronson's co-defendant in the court case, William M. Swepson (1783–1833). Testifying under oath, Swepson stated that he possessed Zenos Bronson's "several boxes of clock works and materials for clocks" of unspecified value, plus \$6 in cash.³³

In leaving some of his assets with Swepson, Bronson was presumably aware that Swepson owned the vast Ravenscroft Estate in Lunenburg County, VA, together with associated plantation lands in North Carolina. He was probably also aware that Swepson owned some 32 slaves.³⁴

On August 19, 1816, the property Swepson held in Bronson's name and the contents of Bronson's abandoned rented shops, including his stock of 60–100 "wooden Clocks" (i.e., movements), clock glass, cabinet supplies, and furniture in various stages of completion were auctioned. The proceeds, however, only partly satisfied the claims of Bronson's Virginia creditors, of whom Cobbs was one.³⁵

ZENOS BRONSON IN GEORGIA

By 1820, Zenos Bronson was operating yet another cabinet shop, this time in Lexington, the seat of Oglethorpe County, GA. The relevant entry in the 1820 US Census Manufacturing Schedule for Oglethorpe County establishes that Bronson was still in the clock-casing business:

Zenos Bronson, Cabinetmaker / Quantity Manufactured Annually: 100 Tables / 200 side boards / 30 bureaus / 100 Clock cases (Figure 5)³⁶

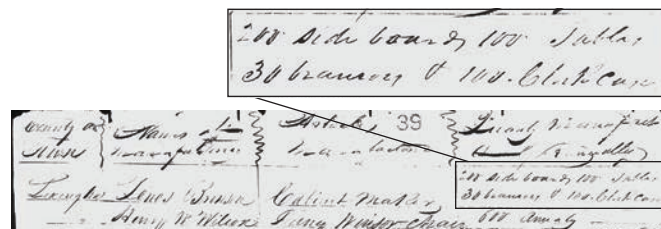


Figure 5. From the 1820 US Census, Manufacturing Schedule, Oglethorpe County, GA. COURTESY OF THE CONNECTICUT STATE LIBRARY.

According to the 1820 US Census (population schedule) for Oglethorpe County, GA, Bronson, aged between 26 and 44 years, was the head of a household in Lexington in which three additional white men between the ages of 16 and 26 resided. All four were employed in manufacturing. As to the men's housekeeping arrangements, one female slave under the age of 14 years and one female slave aged 45 years or older also lived in the household.³⁷

On March 2, 1829, the following legal notice appeared in the Milledgeville, GA, newspaper *Georgia Journal*:

Three negroes to wit: Viney 23 years old, Tom 5 years old, and Amanda 4 months old, and 202 1/2 acres of land, more or less, whereon Hannah Edmondson now lives in the 16th dist.[riect] formerly Baldwin now Jasper county, all levied on as the property of Hannah Edmondson to satisfy sundry fi fas [i.e., executions of court judgments] from Jasper County Superior Court in favor of...Zenos Bronson, bearer, vs. the administrators and Administratrix of the estate of Crawford Edmondson, dec'd.³⁸

It is not known whether or how the sale of land and slaves to satisfy the execution of the Court's judgments in favor of Bronson was consummated, or whether in the process Viney was separated from what appear to be her two children.

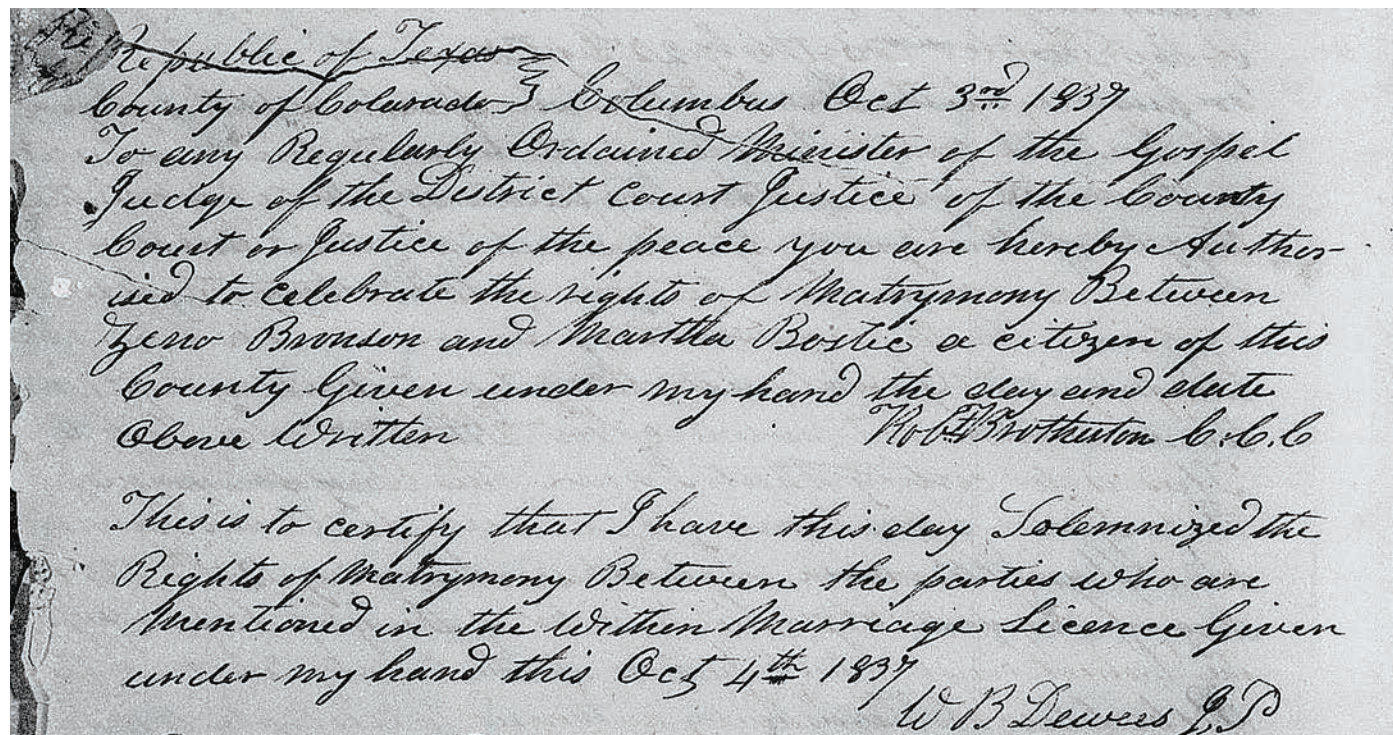
A CAREER CHANGE

Still living in Georgia in 1829, the focus of Bronson's career shifted away from furniture and clock casemaking. In Jasper County, GA, on July 7, he received two US patents: one for a horizontal rack and pinion cotton press and the other for machinery for hulling rice, coffee, clover, and other grains and berries.³⁹ Eighteen months after receiving the patents, on December 22, 1830, an advertisement in the *Augusta Chronicle* alerted readers to the sale of a 50-acre plantation on the outskirts of Augusta "owned and occupied by Mr. Z. Bronson." The property included not only an unidentified crop and agricultural implements but also "carpenter's tools." The advertisement did not mention slaves.⁴⁰ The years between 1834 and 1836 found Bronson living in Cincinnati, OH, where by 1836 he was employed in a steam-powered "Cotton Gin Manufactory."⁴¹

ZENOS BRONSON IN TEXAS

How Zenos Bronson became acquainted with the widow Martha (Hill) Bostick (ca. 1785–1840) remains a matter of speculation. Nevertheless, in Columbus, Colorado County, TX, on October 4, 1837, the two were married in a civil ceremony (Figure 6).⁴²

Figure 6. From *Texas Marriage Records, 1837-1977*. COURTESY OF LATTER DAY SAINTS, FAMILY SEARCH.



The death of her first husband, Levi T. Bostick (1778–1832), left Martha with the care of 5,000 acres of plantation land, crops, some 12 slaves, plus several of Martha and Levi’s nine children who were still minors. Furthermore, when the succession (probate) process on Levi’s estate commenced in 1833, although she could not write, Martha was appointed its administratrix.⁴³

When Martha and Levi settled in Colorado County in 1831, Texas was still part of Mexico. Notwithstanding the fact that Mexico had outlawed slavery in 1829, legal loopholes accommodated the mostly slave-owning American Texas settlers, most of whom engaged in subsistence farming with cotton as a cash crop.⁴⁴

Sometime after Levi’s death on August 13, 1835, Martha contracted with a man by the name of John Butler to produce “the running gear of a [cotton] gin & to make a cotton press...and put the same...gin and screw press in operation” on her plantation.⁴⁵ Although dating some three decades later (to 1871), the image shown in Figure 7 may provide a sense of what the latter apparatus looked like. The agreed price for Butler’s work, \$300, was to be paid upon Martha’s receipt of “two percent of the present cotton crop.”⁴⁶

The late horological researcher Theodore R. Crom (1920–2008) uncovered evidence suggesting that British clockmakers set up and maintained the machinery in Britain’s early cotton manufactories.⁴⁷ Whether or to what extent clockmakers might have played a similar role in the US is uncertain. Nonetheless, the fact that under Martha’s management a geared cotton gin was in use on the Bostick plantation raises the speculation that Zenos Bronson’s initial acquaintance with the widow had something to do with its operation.

Meanwhile, the probate process on Levi Bostick’s estate was interrupted in 1836, when long-simmering disputes between the American Texas settlers and the Mexican government erupted in war. The Texas Revolution ended one month later in the settlers’ victory. When the newly formed independent Republic of Texas adopted its Constitution (modeled after that of the US), it specifically legalized slavery. This explains why, despite the US Congress’s attempt to annex an agreeable Texas by joint resolution in 1838, many Northerners (including a number of Farmington, CT, clockmakers) objected, and the matter languished for a time.⁴⁸



Figure 7. Print from the wood engraving *Scenes in Cotton Land: The Cotton Press* in *Frank Leslie's Illustrated Newspaper* 33, no. 836 (New York: October 1871): 61. COURTESY OF THE LIBRARY OF CONGRESS PRINTS AND PHOTOGRAPHS DIVISION, [HTTPS://WWW.LOC.GOV/PICTURES/ITEM/99614018/](https://www.loc.gov/pictures/item/99614018/).

Zenos Bronson was no doubt aware that at the time of his marriage to Martha, Levi Bostick's estate included a total of 14 slaves, comprising by far the estate's most valuable asset in monetary terms. At a private sale held in February 1839, the 14 slaves were divided among members of the Bostick family, with Martha herself acquiring six of them (Figure 8A).⁴⁹ That slave families were broken up during the estate's partitioning appears likely.

At the time of his death in 1832, Levi Bostick owned a single clock. Valued at \$5, it is reasonable to assume this was a Connecticut-made shelf clock with either a wood or brass movement. I am aware of at least one Connecticut clock peddler—Seth Wheeler (1804–72) of Avon, CT—who entered the Texas territory in 1830–31, selling 8-day brass weight clocks of Joseph Ives's design for their manufacturer, Birge, Case & Co. of Bristol. Another Connecticut clock peddler, Carlos Bates (1808–68) of Granby, may have done the same.⁵⁰

An account dated only "1837" provides a list of Levi's estate's debits to Zenos Bronson (Figure 8B). These included \$107.38 for his services in "Picking out cotton." Zenos's purchases of 16 lb. of "frame and needles" costing \$8.25 and of "bailing + rope" in the amount of \$194.76 likely indicate his procurement of materials needed to repair the on-site cotton gin and to bale a cotton crop.⁵¹

ZENOS BRONSON RIDES INTO THE SUNSET

In June or July 1840, fewer than three years after marrying Zenos Bronson, Martha passed away. At the time of her death, Zenos seems to have been out of the country. In Havana, Cuba, on December, 20, 1841, he boarded the schooner *Hero*, bound for the port of New Orleans.⁵²

It would not have been unusual for Zenos Bronson, the holder of two US patents in agricultural technology plus having experience in setting up wooden tall clocks, to travel to Cuba (then a Spanish colony) in the early 1840s. By the 1830s, a number of American mechanics and engineers customarily worked for slave-holding Cuban plantation owners for four or five months annually, installing and maintaining sugar-processing machinery.⁵³

Although Zenos Bronson paid Martha's Colorado County property taxes for the year 1841, the County Probate Court appointed one of her sons-in-law, Felix G. Secrest, administrator of her estate. Zenos's name was barely mentioned in the probate records, and he was not among the heirs to whom the Probate Court distributed Martha's

Cates. to Zion B. Bostick		Total
Martha Bostick		\$13.00
Boy Plum		\$15.00
Matelan & child Jenny		16.00
Epic Lee		7.00
Boy Isaac		6.00
Epic Betty		21.00
		<u>\$248.00</u>
Washington's Secrets		
Esa & child Howe		\$12.75
Epic Amos		" 3.25

Figure 8A. Results of a private auction showing Martha Bostick's slave purchases from her late husband Levi's estate. TEXAS, US WILLS & PROBATE RECORDS 1833-1974, LEVI T. BOSTICK SUCCESSION RECORDS, 196, ANCESTRY.COM. **B.** Account dated 1837 listing debits from the late Levi T. Bostick's estate to Zenos Bronson. TEXAS, US WILLS & PROBATE RECORDS 1833-1974, LEVI T. BOSTICK SUCCESSION RECORDS, 174, ANCESTRY.COM.

The estate of Levi T. Bostick		Total
1837 to Zenos Bronson		\$194.76
Bailing & rope		8.25
16 lbs frame & needles		25.00
Staples		107.38
Picking out cotton		9.00
2 quarts of Beef		8.00
1 foot & wheel		12.00
3 pr pants		14.00
2 Monkey Sackets		6.00
1 Roundabout		30.00
3 orn coats		7.00
18 lbs ticking		7.00
18 " domestic		18.25
35 " domestic		18.00
9 pair shoes		4.50
1 " Boots		18.00
4 Bushels salt		18.00
100 lbs coffee		10.00
1 Shawl & third yard flannel		20.10
Cash paid Knell		6.00
half Beef		78.80
Tax		5.00
paid to Midwife		24.00
Cash paid Arkhold		20.00
Cash " E. Brown		17.87
2 1/2 yds low cloth		6.00
1 lb " domestic		26.00
1 Barrel flour		\$710.91
deduct on half of the list change		39.70
		<u>\$671.21</u>

inherited lands.⁵⁴ Nevertheless, beginning in 1840 and continuing through 1848, Zenos's name appeared on the Colorado County tax assessment lists as the owner of a 640-acre parcel bordering Sandies Creek. The list of 1846 further identified Zenos as the "original grantee or for whom [the parcel was] surveyed."⁵⁵

After 1848, no further mention of Zenos Bronson's name appeared on Texas county tax lists. Therefore, it may be assumed that Bronson, then approximately 65 years old, passed away during 1847 or 1848. One is left to wonder exactly where and how Zenos Bronson, the cabinet and clock casemaker, inventor, wanderer, adventurer, and husband to a slave-owning widow in frontier Texas, finally met his fate.

The third and final portion of this article will examine the life of a little-known but highly influential clock peddler, who, like Zenos Bronson, was once a slave owner, before briefly exploring the connection between clock decoration and slavery on the continent of Africa.

Notes and References

1. Bernard Bailyn, David P. Davis, David H. Donald, John L. Thomas, Robert H. Wiebe, and Gordon S. Wood, *The Great Republic*, 2nd ed., vol. 1 (Lexington, MA: D.C. Heath & Co., 1981), 397.
2. For example, beginning in 1784, Connecticut law provided that, if born into slavery, Indian and "colored" children then under the age of seven, and any born after March 1, 1785, were to be freed at age 25. In 1788, a state statute prohibited the trading of slaves in Connecticut vessels. A law passed in 1792 prohibited taking a slave out of the state, or kidnapping and selling a person who was to be freed at age 25. In 1797 the age of emancipation was lowered to 21. The possession of slaves in Connecticut was absolutely forbidden after 1848. See Bernard C. Steiner, *The History of Slavery in Connecticut* (Baltimore, MD: Johns Hopkins University Press, 1893), 30-31. Furthermore, the Massachusetts State Constitution of 1780 established that "all men are free and equal." Subsequent decrees of the Massachusetts Supreme Judicial Court in 1781 clarified the matter; see <https://www.mass.gov/guides/massachusetts-constitution-and-the-abolition-of-slavery>.
3. Bailyn et al., *The Great Republic*, 391, 399-400.
4. A transcript of the complete Declaration of Independence may be found at <https://www.archives.gov/founding-docs/declaration-transcript>.
5. [Benjamin Banneker and Thomas Jefferson], *Copy of a Letter from Benjamin Banneker, to the Secretary of State, with His Answer* (Philadelphia, PA: Daniel Lawrence, 1792); Mary Jane Dapkus, "A New Look at Benjamin Banneker (1731-1806): African American Astronomer, Philomath, and Clockmaker," *Watch & Clock Bulletin* 63, no. 449 (January/February 2021), 9-15.
6. American Colonization Society, "Receipts...from the 20th March to the 20th May, 1848," in *African Repository and Colonial Journal* 22, no. 6 (Washington, DC: 1848), 196; see also James F. Clark, *Anti-Slavery Days: A Sketch of the Struggle Which Ended in the Abolition of Slavery in the United States* (New York: R. Worthington, 1884), 36-37.
7. Bailyn et al., *The Great Republic*, 398-402.
8. Clark, *Anti-Slavery Days*, 33-36; Danvers [MA] Historical Society, *Old Anti-Slavery Days: Proceedings of the Commemorative Meeting, Held by the Danvers Historical Society...April 26, 1893* (Danvers, MA: Danvers Mirror Printer, 1893), xii-xvii. In Danvers, another possible tall-clock maker among the *Liberator's* early subscribers was Ezra Dodge, although it is uncertain whether this was the same person as the clockmaker by that name. I thank Damon Di Mauro for bringing the latter source to my attention.
9. Danvers [MA] Historical Society, *Old Anti-Slavery Days*, 151; Gary R. Sullivan, "Clockmaking in Southeastern Massachusetts: The Bailey Family of Hanover," in Brock Jobe, Gary R. Sullivan, and Jack O'Brien, *Harbor & Home* (Lebanon, NH: University Press of New England, 2009), 39-44.
10. Francis Atwater, compiler, *History of the Town of Plymouth, Connecticut* (Meriden, CT: Journal Publishing Co., 1895), 225.
11. Christopher Bickford, *Farmington in Connecticut* (Canaan, NH: Phoenix Publishing, 1983), 210-13.
12. Snowden Taylor and Mary Jane Dapkus, *Antebellum Shelf Clock Making in Farmington and Unionville Villages, Connecticut* (Columbia, PA: NAWCC, 2018), 1-7.
13. See "Connecticut Abolitionists," National Park Service, <https://www.nps.gov/articles/connecticut-abolitionists.htm>; see also [no author], "Connecticut A.S. Convention," *Charter Oak* 1, no. 1, Connecticut Anti-Slavery Society, March 1838, 1; Taylor and Dapkus, *Antebellum Shelf Clock Making*, 1-6; and Calvin D. Cowles, compiler, *Genealogy of the Cowles Families in America*, vol. 1 (New Haven, CT: Tuttle, Morehouse & Taylor Co., 1929), 260.
14. Bickford, *Farmington in Connecticut*, 212.
15. Bickford, *Farmington in Connecticut*, 210-13.
16. Edwin M. Bidwell, *Genealogy to the Seventh Generation of the Bidwell Family in America* (Albany, NY: Joel Munsell's Sons, 1884), 100; *State v. Abner Bidwell*, Hartford County Superior Court Files, Box 429, Connecticut State Library.
17. Bickford, *Farmington in Connecticut*, 211.
18. *Joseph R. Gillett v. Frederick P. Hall, Edward Seymour, Edward Sexton, and Anson Williams*, Litchfield County Superior Court Files, Box 219, Connecticut State Library.
19. *Charter Oak* 1, no. 1, 1.
20. *Charter Oak* 1, no. 14, Connecticut Anti-Slavery Society, April 1839, 2.

21. "Charter Oak—Extra—Prospectus," *Charter Oak*, Connecticut Anti-Slavery Society, June 14, 1838, 1–2, from the Julius Gay Papers, box 3, Farmington [CT] Public Library.
22. Taylor and Dapkus, *Antebellum Shelf Clock Making*, 75–77.
23. "Charter Oak—Extra—Prospectus," 1–2.
24. Connecticut General Assembly Papers, 1838–39, Box 28, RG2, Connecticut State Library.
25. Bickford, *Farmington in Connecticut*, 212.
26. Taylor and Dapkus, "Williams, Orton, Prestons & Co. in Illinois," chap. 5 in *Antebellum Shelf Clock Making*, 113–39.
27. Bickford, *Farmington in Connecticut*, 210–13.
28. Note "Preston's" in the singular, Noah Preston having been ejected from the partnership in 1842. He died in 1845. See Taylor and Dapkus, *Antebellum Shelf Clock Making*, 100, 106–7; and Bickford, *Farmington in Connecticut*, 213.
29. Portions of this section appeared previously in Mary Jane Dapkus, "The Mysterious, Multi-State Matter of Zenos Bronson," *Cog Counter's Journal* no. 44 (Summer 2022), 34–46; and "A Zenos Bronson Post Script," *Cog Counters Journal* no. 45 (Summer 2023), 70–82.
30. See Dapkus, "The Mysterious, Multi-State Matter of Zenos Bronson," 34–46, particularly the transcript of the letter from Bronson to William K. Lamson dated November 2, 1812, appearing on pages 36–37.
31. "Lamson, Sperry & Co. accounts 1811–1813," NAWCC Fortunat Mueller-Maerki Library and Research Center, Columbia, PA.
32. Dapkus, "The Mysterious, Multi-State Matter of Zenos Bronson," 34–46. See also Chris H. Bailey, "Mr. Terry's Waterbury Competitors," *Bulletin of the National Association of Watch and Clock Collectors, Inc.* 21, no. 200 (June 1979): 258–59.
33. *Thomas Cobbs v. Zenos Bronson, etc.*, box 18, no. 1815-014, Mecklenburg County [VA] Chancery Court Records, Library of Virginia.
34. [No author], "Swepson, William Mallory," Caswell County, NC, Genealogy, <https://caswellcountync.org/genealogy/getperson.php?personID=117503+tree=tree1#cite1>. See also 1820 US Census, Lunenburg County, VA.
35. See *Samuel Brame & Co. v. Zenos Bronson, etc.*, box 17, no. 1815-012, Mecklenburg County [VA] Chancery Court Records, Library of Virginia.
36. 1820 US Census, Manufacturing Schedule, Oglethorpe County, GA.
37. 1820 US Census, Population Schedule, Oglethorpe County, GA. Note that the 1820 US Census for Oglethorpe Co. did not use printed forms, and the 23 data columns did not correspond with the total of 32 data items required to be collected by the Census Bureau in 1820; see <https://www.archives.gov/research/census/1820>. The information provided was therefore inferred from column headings in the total of 23 columns specified in the 1820 Census for Lincoln County, GA.
38. *Georgia Journal* [Milledgeville, GA], March 2, 1829.
39. *Georgian* [Savannah, GA], January 23, 1830.
40. *Augusta Chronicle* [GA], December 22, 1830.
41. *The Cincinnati Directory for the Year 1834* (Cincinnati, OH: Elizur Deming, 1834), 25; *The Cincinnati Directory and Advertiser for the Year 1836–7* (Cincinnati, OH: J.H. Woodruff, 1836), 25. I thank Robert C. Manke for bringing these sources to my attention.
42. *Texas Marriage Records 1837–1977*, Latter Day Saints, Family Search.
43. *Texas, US, Wills & Probate Records, 1833–1974*, Levi Bostick Succession Records: 84–196, Ancestry.com.
44. [No author], *History of Texas, Together with a Biographical History of the Cities of Houston and Galveston* (Chicago: Lewis Publishing Co., 1895), 533–34.
45. Levi Bostick Succession Records: 162.
46. Levi Bostick Succession Records: 162.
47. Theodore R. Crom, *Early Lancashire Horological Tools and Their Makers* (Hawthorne, FL: Theodore R. Crom, 1994), 3.
48. *History of Texas*, 533–37.
49. Levi Bostick Succession Records, 143–45.
50. Levi Bostick Succession Records, 143–45; Mary Jane Dapkus, "Seth Wheeler—1804–72, Clock Peddler of Avon, CT," *Watch & Clock Bulletin* 55, no. 406 (November/December 2013): 632.
51. Levi Bostick Succession Records: 174.
52. *New Orleans, LA US Passenger Lists 1813–1963*, Selected Passenger and Crew Lists and Manifests, National Archives, Washington, DC, Ancestry.com; and *Austin [TX] City Gazette*, September 16, 1840.
53. See "Cuba–US History," Havana Unwrapped, <https://www.havana-unwrapped.com/cuba-us-history.html>.
54. *Texas, Colorado County Probate Records*, Martha Bostick Succession Records, Minute Book A: 35; Minute Book B: 15, 21–22, 31, 83, 106, 115; Minute Book C: 12, 176; and Final Record Book B: 58, 443–48, Latter Day Saints, Family Search.
55. *Texas, Colorado County Tax Rolls for the years 1840–1850*, Latter Day Saints, Family Search; *Jackson County, Texas Tax List 1846*; and *Colorado County, Texas, Tax List, 1848*, Ancestry.com.

About the Author

Mary Jane Dapkus, formerly curator of the American Clock and Watch Museum (ACWM) in Bristol, CT, previously worked as an environmental analyst while earning advanced degrees. Together with the late Dr. Snowden Taylor, she is the coauthor of the book *Antebellum Shelf Clock Making in Farmington and Unionville Villages, CT* (NAWCC, 2019), and author of *Joseph Ives (1782–1862) and the Looking Glass Clock* (ACWM, 2020). Mary Jane's articles have appeared in the *Watch & Clock Bulletin*, *The Cog Counter's Journal*, the Willard House & Clock Museum's *Pendulum*, and the ACWM's *Timepiece Journal*, of which she serves as editor.

The Atlantic Clock Works of Birmingham, England, Revealed

Part 8: Conclusions and Appendices

By Peter Gosnell (UK)

INTRODUCTION

In Part 1 of this series of articles, a synopsis of all known contemporary published data relating to C. & H. Cartwright's clockmaking activities from 1867 to 1901 is presented.¹ Parts 2 through 7 introduce a family of unnamed clocks that are now believed to be the products of C. & H. Cartwright's manufactory. The chronology of the different movement models, a selection of case designs, and different printings of their Superior labels have been investigated and illustrated.² To date, not one single piece of indisputable evidence that unequivocally confirms this family of clocks were the products of C. & H. Cartwright has been found. However, as the "footprint" that they create appears to be a perfect match to the data presented in Part 1, this would seem to confirm they are, in all probability, one and the same. There are now three issues left that still need to be discussed before this study is finished.

ISSUE 1: WHY DID C. & H. CARTWRIGHT NEVER DISPLAY ITS NAME ON ANY OF ITS PRODUCTS?

To suggest a possible answer to this question, we first need to review the movements presented in Parts 2–6 of this series.

As discussed in Part 2, what is now believed to be the first movement produced by C. & H. Cartwright at the Atlantic Clock Works in 1867, called the "First Attempt" ("F.A.") movement, appears to be an amalgamation of different design elements copied from three contemporary American movements. These included a movement manufactured by the E. N. Welch Manufacturing Co. (Forestville, CT) now called the "E.N.W." movement; one from any number of New Haven Clock Co. (New Haven, CT) movement models; and a believed Sperry & Bryant (New York, NY) movement.

This "F.A." movement turned out to be poorly built and was soon abandoned. C. & H. Cartwright then produced what was believed to be its second model, previously called the "Early Production" ("E.P.") movement. The "E.P." movement was found to be of much better quality compared to the previous "F.A." movement. It was an almost identical copy of the same "E.N.W." movement copied in part for the earlier "F.A." movement, except that C. & H. Cartwright gave its "E.P." movement a 4-spoke escape wheel (while contemporary "E.N.W." movements usually had a 5-spoke escape wheel), Sperry & Bryant-styled great wheel click return springs (while "E.N.W." movements had wire return springs), and an English-styled, comma-shaped hammer (instead of the "E.N.W." movement's round hammer). It now seems likely that C. & H. Cartwright may have introduced these three

changes to the "E.P." movement to try to hide its true origin, perhaps prompted by a fear of prosecution by the E. N. Welch Manufacturing Co. in some way.

As presented in Part 3, C. & H. Cartwright then produced "Square Nut" ("S.N.") striking and time-only movements, but we are only interested in the striking movements here. Time-only movements were found to be an original design, not copied from elsewhere. Part 4 investigated the "Tempus Raptor" ("T.R.") movements. Once again both "S.N." striking and "T.R." models were found to be copies of the same "E.N.W." movement but with more minor detail changes. "T.R." movements were also given a so-called "Tempus Raptor" trademark, punched onto the front plate, but this was never registered as a trademark and so in all probability was applied merely to impress and to give these movements their own distinctive identity.

As presented in Part 5, C. & H. Cartwright introduced movements with lyre-shaped plates sometime after 1880. These movements also had thicker rimmed main train wheels, but these new "Lyre Plate" movements still copied the same component layout of the original "E.N.W." movement. "THE CALEDONIAN REGISTERED" name was then punched onto these movements with lyre-shaped plates but, as before, this name was never registered as a trademark. "The Caledonian Registered" ("T.C.R.") movements had raised ribs applied to those thicker rimmed main train wheels, and the old E. N. Welch-styled escape wheel cock was replaced by a new Seth Thomas (Plymouth, CT)-styled cock. As the manufacture of the "T.C.R." movements progressed, more puzzling³ changes took place: the comma-shaped hammer was exchanged for a plain, round hammer, a much larger drop slot disc was introduced that eventually only had one edge, the four spokes of the minute wheel were exchanged for six holes instead, and the fly used two holes to secure it to its arbor rather than steel wire.

C. & H. Cartwright continually made small changes, some of them purely visual, to what were always copies of the same "E.N.W." movement layout, from the "E.P." movement onward. C. & H. Cartwright may have believed such modifications would further disguise the true origin of their movements as well as making them look more distinctive, even though this tinkering would have increased costs. In relation to what have been described as "puzzling" changes made to later "T.C.R." movements, I now believe C. & H. Cartwright's intentions were somewhat different.



Figure 1. Front of the movement with lyre-shaped plates, name-punched "S. Thomas / Plymouth Conn / USA". AUTHOR'S PHOTO.

Figure 1 shows the front view of a spring-driven, striking movement with lyre-shaped plates that is name-punched "S. Thomas / Plymouth Conn / U.S.A." This movement has ribbed wheels, unidirectional great wheel clicks with wire return springs, and a round hammer. Figure 2A is a front view and Figure 2B is a left (striking side) front view detail of a second movement with what could be called "box-on-box" shaped plates that is name-punched "S. Thomas / Thomaston CT. / U.S.A." Notice that this second movement has the same three features highlighted on the first Seth Thomas movement and additionally has blued machine screws to secure the front plate (seen in Figure 2A), a large drop slot disc with a single edge, and a fly that uses two slots to secure it to its arbor (both seen in Figure 2B). The first movement with lyre-shaped plates and "Plymouth" in the name was probably manufactured sometime before or shortly after 1865 when Plymouth was changed to Thomaston in honor of Seth Thomas, then deceased.⁴ The second movement model with "box-on-box" shaped plates and "Thomaston" in the name was

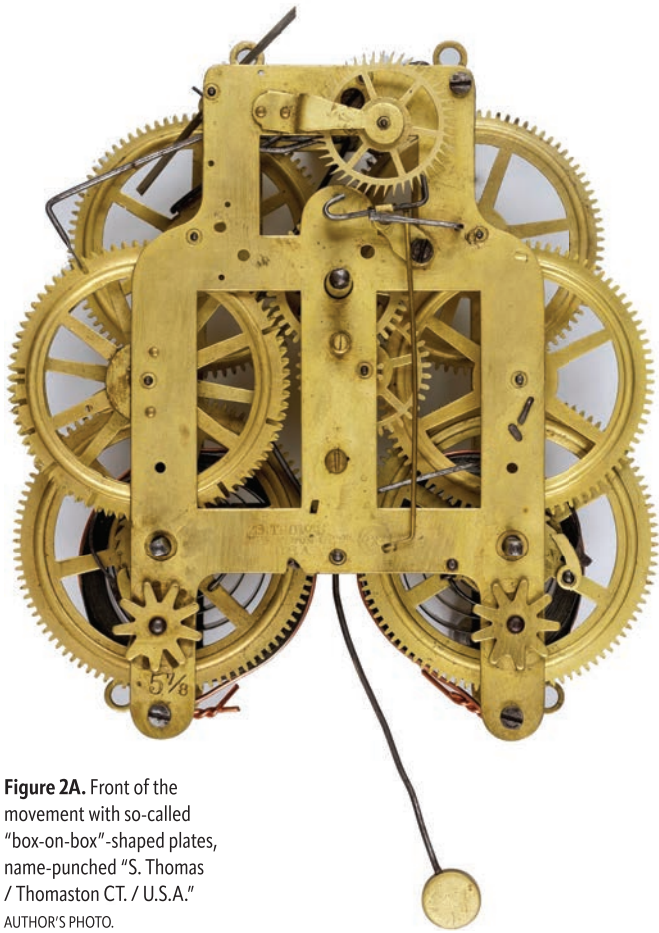
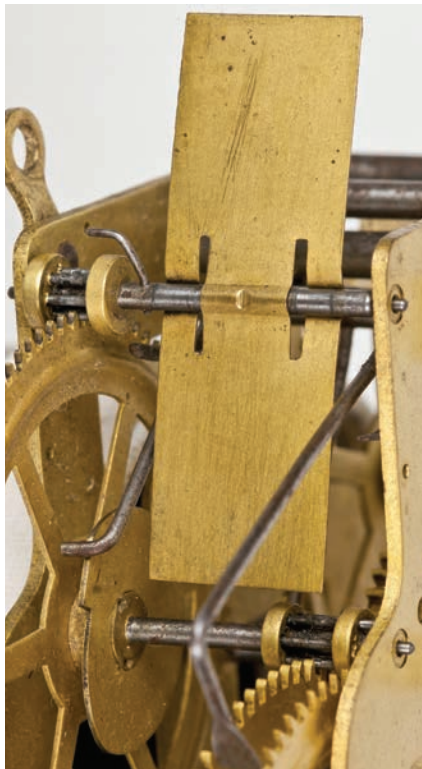


Figure 2A. Front of the movement with so-called "box-on-box"-shaped plates, name-punched "S. Thomas / Thomaston CT. / U.S.A." AUTHOR'S PHOTO.

Figure 2B. Large, single-edge drop slot disc and fly with two slots belonging to the movement in Figure 2A. AUTHOR'S PHOTO.



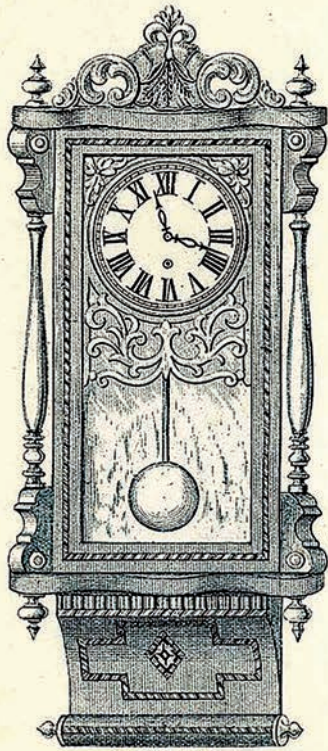
shown at the "Exposition Universelle," Paris, in 1878.⁵ So, both of these Seth Thomas movement designs pre-date "T.C.R." movements. Notice from Figure 1 and Figures 2A and 2B how these two Seth Thomas movements collectively contain all the details, including the so-called "puzzling" changes found on later "T.C.R." movements. The exception is the fly seen in Figure 2B that has slots rather than holes, and the minute wheel on the same Seth Thomas movement with "box-on-box"-shaped plates that does have the same six holes found on later "T.C.R." movements, even though these holes are not visible in Figure 2A.

So why would C. & H. Cartwright have adopted these Seth Thomas details from these two movements for use on its later "T.C.R." movements? Figure 3 shows a page from an original Robert M. Marples & Sons catalog, illustrating three (out of a total of 14) Anglo-American clocks.⁶ The script below all 14 of these Anglo-American clocks informs that all these cases could be purchased with either a "Welch" (meaning E. N. Welch Manufacturing Co.) or alternatively a Seth Thomas movement fitted within. Perhaps discernible from Figure 3 is the difference in cost between the "Welch" and Seth Thomas movements, with the latter always 4 shillings more. During this era, Seth Thomas movements were judged, in both England and the US, as being a better-made product compared to other Connecticut-manufactured movements. Consequently, the Seth Thomas movements always commanded a higher price.⁷

It therefore appears that C. & H. Cartwright copied details from these two Seth Thomas models to make its later "T.C.R." movements look more like a better-quality Seth Thomas product so that they could, in all probability, charge higher prices. In Part 5 of this series, we saw that C. & H. Cartwright produced what have been called "The Caledonian Registered Vienna" movements. These were a modified design of the "T.C.R." movement that could be hidden within Vienna Regulator-styled copy cases that, from a cursory inspection, had the appearance of more expensive genuine Austrian regulators. In Part 6, we found that the one-day duration "Caledonian" movement was a nearly identical copy of a Seth Thomas "5B-D" model movement.

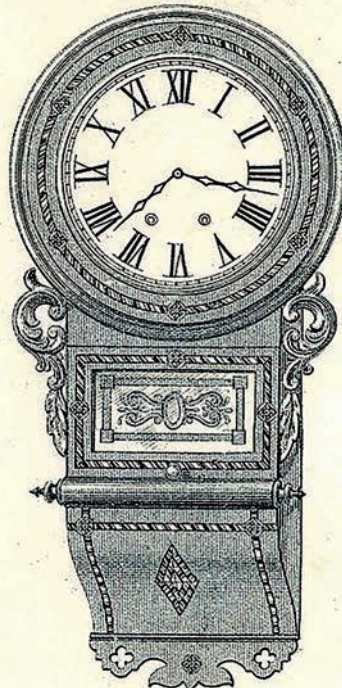
Taking all this information collectively, we can conclude that C. & H. Cartwright copied movements that incorporated features and details to not only hide its movements' origin but also embellished its products so

ENGLISH CASED CLOCKS.



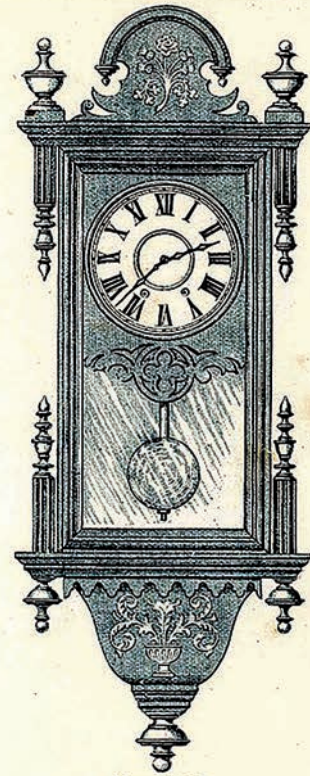
No. 116.

Dial, 8½ inches. Length of Case, 41 inches.
Prices, Seth Thomas, 39/-; Welch, 35/-.



No. 118.

Dial, 12 inches.
Prices, Seth Thomas, 35/-; Welch, 31/-.



No. 130.

Dial, 8½ inches. Length of Case, 30 inches.
Prices, Seth Thomas, 48/-; Welch, 39/-.

TIMEPIECE 4/- EACH LESS THAN ABOVE PRICES.

Figure 3. Page from an original Robert M. Marples & Sons, Holborn Viaduct, London, England, catalog dated 1899. AUTHOR'S COLLECTION.

that they appeared to be of a better quality than they actually were. Knowing all this now, it doesn't seem very surprising that C. & H. Cartwright chose to keep its name and the origin of its products anonymous.

ISSUE 2: WHY WAS A PSEUDO-ROYAL COAT OF ARMS USED ON LABELS?

All nine different printings of unnamed Superior labels found within C. & H. Cartwright's drop dial and Prize-Medal regulator cases (previously identified in Parts 3, 4, 5, and 7 of this series⁸) have a pseudo-Royal Coat of Arms of the United Kingdom at the top. What was its purpose?

To understand C. & H. Cartwright's possible reasoning behind using such a device, the rules for granting permission to display a genuine Royal Coat of Arms of the United Kingdom first need to be understood. Beginning in the 18th century, tradesmen who enjoyed royal patronage were granted the right to display the Royal Coat of Arms on their products or in their shop, according to the Lord Chamberlain's rules.⁹ It seems reasonable to assume that C. & H. Cartwright probably hoped its use of a pseudo-Royal Coat of Arms at the top of the unnamed Superior labels would have impressed the viewer with its iconography. Perhaps its use convinced some unsuspecting viewers into thinking these clocks had been granted a royal warrant, guaranteeing their superior quality, which in turn could have helped sales.



Figure 4. Front plates from “The Caledonian Registered” and Fattorini & Sons movements placed side by side.
AUTHOR’S PHOTO.



Figure 5. Front of another movement name-punched “Fattorini & Sons / Bradford / English Manufacture”.
AUTHOR’S PHOTO.

ISSUE 3: DID THE BRITISH UNITED CLOCK CO. MAKE “T.C.R.” AND “FATTORINI & SONS” MOVEMENTS?

The similarity between the outside plate shape of “The Caledonian Registered” movements and certain patented alarm clock movements name-punched “Fattorini & Sons / Bradford / English Manufacture” has been noted. Could both have been made by the same maker, possibly the British United Clock Co.?

Figure 4 shows a front plate from a “T.C.R.” movement and one of the Fattorini & Sons movements placed side by side. Notice how the top and sides of the outside plate’s profile are the same on both movements. Figure 5 shows a complete example of one of these patent automatic alarm movements punched “Fattorini & Sons / Bradford / English Manufacture”.

More than 40 years ago, E. J. Tyler expressed his feeling that these Fattorini & Sons movements may have been produced by the British United Clock Co. (Birmingham,

England). He pointed out that it had also been suggested (from a source unknown) that the “The Caledonian Registered” movement could also have been a product of British United.¹⁰ My own investigations have shown that neither of these two opinions appear to have any supporting evidence to back them up. The same connection between these two movements was referred to by the late Tom Spittler in *Clocks Magazine* and then his article was reprinted, in part, in the *Bulletin*.¹¹

I have researched, examined, and compared a number of these Fattorini & Sons movements, several “T.C.R.” movements, and an example of every known movement model produced by the British United Clock Co. (“B.U.C.C.”) that now form the British Museum’s “B.U.C.C.” collection. I have concluded that the Fattorini & Sons movements were, in all probability, made by the “B.U.C.C.,” as all Fattorini & Sons and some “B.U.C.C.” movements share common component details while no common elements between “T.C.R.” and “B.U.C.C.” movements could be found. What therefore now seems a far more plausible scenario is that just as the “B.U.C.C.”

was expanding its operations at its new factory in Gravelly Hill, Birmingham, after November 1888,¹² C. & H. Cartwright was probably scaling back its operations at the nearby Atlantic Clock Works on Cumberland Street, Birmingham, closing by 1892.¹³ It now seems feasible that the "B.U.C.C." could have acquired tools and equipment from the neighboring Atlantic Clock Works when they closed down, among which could have been the punch and die set that had previously been used to create the top and side profile for "T.C.R." movements. It seems likely that this same punch and die set was then later used by the "B.U.C.C." when it started producing these

unique patent automatic alarm clock movements for Fattorini & Sons, sometime after 1897.¹⁴

The fact that quite a number of C. & H. Cartwright's clocks have survived, especially those containing "Square Nut" striking and "Tempus Raptor" and "The Caledonian Registered" movements, suggests that C. & H. Cartwright did achieve some success with its endeavors at the Atlantic Clock Works. It now appears that Atlantic Clock Works was the first factory in England to produce clock movements by employing the American factory system of interchangeable parts.

APPENDIX 1: TABLES AND ABBREVIATION KEY *(continued on next page)*

MOVEMENTS:	"F.A."	"E.P."	"S.N.t.5"	"S.N.s.4"	"S.N.t.4"	"T.R.1.1"	"L.P.1"	"T.C.R.V"
			"S.N.s.5"			"T.R.1.2"	"L.P.2"	
						"T.R.2"	"T.C.R.3"	
							"T.C.R.4"	
							"T.C.R.5"	
TIME TRAIN								
Great wh.	96	96	96	96	96	96	96	96
2nd wh. arbor	80*- 8	84*- 8	84*- 8	84*- 8	84*- 8	84*- 8	84*- 8	84*- 8
3rd wh. arbor	80 - 6	84 - 6	84 - 6	80 - 6	80 - 6	80 - 6	80 - 6	84 - 7
Esc. Wh. arbor	40 - 6	36 - 6	48 - 6	33 - 6	52 - 6	38 - 6	36 - 6	35 - 7
				35 - 6	54 - 6	40 - 6	38 - 6	
				38 - 6			40 - 6	
				40 - 6			45 - 6	
				54 - 6				
MOTION WORK								
Minute wh. arbor	40*- 12	42*- 12	42*- 12	42*- 12	42*- 12	42*- 12	42*- 12	42*- 12
Interm. wh. arbor	36 - 10	36 - 9	36 - 9	36 - 9	36 - 9	36 - 9	36 - 9	36 - 9
Hour cannon wh.	40	36	36	36	36	36	36	36
STRIKING TRAIN								
Great wheel	96	96		96		96	96	96
2nd wh. arbor	78 - 8	78 - 8		78 - 8		78 - 8	78 - 8	78 - 8
No. of strike pins	13	13		13		13	13	13
3rd wh. arbor	75 - 6	80 - 6		80 - 6		80 - 6	84 - 6	84 - 6
Fly arbor	5	5		5		5	6	6

Table 1. Train counts for all 8-day movements presented in Parts 2-5 of this series.

TIME TRAIN	
Great wheel	60
Minute arbor	36 - 10
3rd wheel arbor	39 - 7
4th wheel arbor	36 - 7
Escape wheel arbor	29 - 7
MOTION WORK	
Minute arbor	12
Interm. wh. arbor	36 - 10
Hour cannon wh.	40

Table 2. Train count for the "1-d.C" movement.

APPENDIX 1 *(continued)*

PUNCHED NUMBER	NO. OF ESCAPE WHEEL TEETH	APPROX. PEND. LENGTH
0	33	13"
9	36	12"
8	38	10"
7	40	9"
2	52	4.8"
2	54	4.7"

Table 3. Punched numbers found on "S.N.," "T.R.," "L.P.," and "T.C.R." movements' escape wheels and their approximate pendulum lengths.

LABEL	FOUND WITH MOVEMENTS
"S.1"	"S.N.s.4"
"S.2"	"S.N.s.4" & "T.R.1.2"
"S.3"	"S.N.s.6", "T.R.1.2", "T.R.2", "L.P.1" & "T.C.R.3"
"S.4"	"T.C.R.3" & "T.C.R.4"
"S.5"	"T.C.R.4" & "T.C.R.5"
"S.6"	"T.C.R.4" & "T.C.R.5"
"S.7"	"N.H.S.Y."
"S.8"	"N.H.S.Y." & "N.H.R.A."
"S.9"	"N.H.T.A.", "E.N.W." & possible "A.C.C."

Table 4. Movements found with different Superior labels.

ABBREVIATIONS

"F.A." – "First Attempt" movement
 "E.P." – "Early Production" movement
 "S.N.s.5" – "Square Nut" striking movement with a 5-spoke escape wheel
 "S.N.t.5" – "Square Nut" timepiece movement with a 5-spoke escape wheel
 "S.N.s.4" – "Square Nut" striking movement with a 4-spoke escape wheel
 "S.N.t.4" – "Square Nut" timepiece movement with a 4-spoke escape wheel
 "S.N.s.6" – "Square Nut" striking movement with a 6-spoke escape wheel
 "T.R.1.1" – "Tempus Raptor No. 1.1" movement
 "T.R.1.2" – "Tempus Raptor No. 1.2" movement
 "T.R.2" – "Tempus Raptor No. 2" movement
 "L.P.1" – "Lyre Plate No. 1" movement
 "L.P.2" – "Lyre Plate No. 2" movement
 "T.C.R.3" – "The Caledonian Registered No. 3" movement
 "T.C.R.4" – "The Caledonian Registered No. 4" movement
 "T.C.R.5" – "The Caledonian Registered No. 5" movement
 "1-d.C." – "1-Day Caledonian" movement
 "T.C.R.V" – "The Caledonian Registered Vienna" movement
 "N.H.S.Y." – "New Haven Clock Co. Single-Y-plate" movement
 "N.H.R.A." – "New Haven Clock Co. Rectangular-Aperture-plate" movement
 "N.H.T.A." – "New Haven Clock Co. Tombstone-Aperture-plate" movement
 "E.N.W." – "E.N. Welch Manufacturing Co." movement
 "A.C.C." – "Ansonia Clock Co." movement
 "S.1" – "Superior No. 1" label
 "S.2" – "Superior No. 2" label
 "S.3" – "Superior No. 3" label
 "S.4" – "Superior No. 4" label
 "S.5" – "Superior No. 5" label
 "S.6" – "Superior No. 6" label
 "S.7" – "Superior No. 7" label
 "S.8" – "Superior No. 8" label
 "S.9" – "Superior No. 9" label

Acknowledgments

First, I would like to thank Mary Jane Dapkus for reading through my drafts, making suggestions, and encouraging me to complete these articles. I would also like to thank the following people who have either shared their knowledge or given me access to clocks: Chris Bailey, Cotswold Clocks, Lynda Cotton Gallery, John Delaney, Bill Dugan, James Edgar, Laurie Farnam, Goulding, Young & Mawer Auction Rooms, Paul Harman, the late Paul Heffner, Terry Janson, Key Fine Art Auctioneers, Malcolm Langford, Chris Machin, Joseph McKenna, Tony Mitchell, James Mosely, Andy Naylor, Barry Parker, Roger Pedley, David Peters, Gary Pitt, Ted Powell, John Robey, Ken Robinson, Bryan Rogers, Bob Schut, the late Tom Spittler, the late Doug Stevenson, the late Peter Steward, the late John Taylor (Derby), the late Snowden Taylor, Steven Thornberry, Daniel Wilkinson, and Wootton Auction Rooms Ltd. Last, I would like to thank Laura Taylor and her team for their hard work, patience, and editorial excellence.

Notes and References

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2. Peter Gosnell, "The Atlantic Clock Works of Birmingham, England, Revealed: Part 2: 'First Attempt' & 'Early Production' Movements," *Watch & Clock Bulletin* 65, no. 462 (March/April 2023): 99–108; "Part 3: 'Square Nut' Movements," *Watch & Clock Bulletin* 65, no. 463 (May/June 2023): 160–71; "Part 4: 'Tempus Raptor' Movements," *Watch & Clock Bulletin* 65, no. 464 (July/August 2023): 244–53; "Part 5: 'The Caledonian Registered' Movement," *Watch & Clock Bulletin* 65, no. 465 (September/October 2023): 325–39; "Part 6: One-Day 'Caledonian' Movement," *Watch & Clock Bulletin* 65, no. 466 (November/December 2023): 382–87; "Part 7: C. & H. Cartwright's Anglo-American Clocks," *Watch & Clock Bulletin* 66, no. 467 (January/February 2024): 46–55.

APPENDIX 2: DISTINCTIONS BETWEEN DIFFERENT SUPERIOR LABELS

In total, nine dissimilar printings of Superior labels have now been found. However, all Superior labels have a pseudo-Royal Coat of Arms of the United Kingdom at the top with the word "SUPERIOR" as the first line of text directly underneath.

"Superior No. 1" ("S.1") labels additionally have:

1. An overall horizontal, rectangular format
2. Black printing ink only
3. The lion's head facing to the left
4. The "N" of "MOVEMENT" printed backwards
5. Periods (or "full stops" in UK English) after the 2nd, 3rd, and 6th lines of text
6. The "R" of "FOR" above the "A" of "ABROAD"

See Peter Gosnell, "The Atlantic Clock Works of Birmingham, England, Revealed: Part 3: 'Square Nut' Movements," *Watch & Clock Bulletin* 65, no. 463 (May/June 2023): 164, Figure 3H.

"Superior No. 2" ("S.2") labels additionally have:

1. An overall vertical, rectangular format with a curved bottom edge
2. Black, yellow, blue, and red printing ink
3. The lion's head facing to the left
4. The third line of text reading "ENGLISH MADE CLOCK"

See Peter Gosnell, "The Atlantic Clock Works of Birmingham, England, Revealed: Part 3: 'Square Nut' Movements," *Watch & Clock Bulletin* 65, no. 463 (May/June 2023): 165, Figures 4B and 5B.

Superior No. 3 ("S.3") labels additionally have:

1. An overall horizontal, rectangular format
2. Black, yellow, blue, and red printing ink
3. The lion's head facing to the left
4. The "N" of "MOVEMENT" printed backwards
5. Periods (or "full stops" in UK English) after the 2nd, 3rd, and 6th lines of text
6. The "R" of "FOR" above the "A" of "ABROAD"

See Peter Gosnell, "The Atlantic Clock Works of Birmingham, England, Revealed: Part 3: 'Square Nut' Movements," *Watch & Clock Bulletin* 65, no. 463 (May/June 2023): 169, Figure 12C.

Superior No. 4 ("S.4") labels additionally have:

1. An overall horizontal, rectangular format
2. Black, yellow, blue, and red printing ink
3. The lion's head facing to the left
4. The "N" of "MOVEMENT" correctly rendered
5. Periods (or "full stops" in UK English) after the 2nd, 3rd, and 6th lines of text
6. The "R" of "FOR" above the "A" of "ABROAD"

See Peter Gosnell, "The Atlantic Clock Works of Birmingham, England, Revealed: Part 5: 'The Caledonian Registered' Movements," *Watch & Clock Bulletin* 65, no. 465 (September/October 2023): 331, Figure 6B.

Superior No. 5 ("S.5") labels additionally have:

1. An overall horizontal, rectangular format
2. Black, yellow, blue, and red printing ink
3. The lion's head facing to the left
4. The "N" of "MOVEMENT" correctly rendered
5. No periods (or "no full stops" in UK English) after any lines of text

6. The "R" of "FOR" above the "A" of "ABROAD"

See Peter Gosnell, "The Atlantic Clock Works of Birmingham, England, Revealed: Part 5: 'The Caledonian Registered' Movements," *Watch & Clock Bulletin* 65, no. 465 (September/October 2023): 332, Figure 8.

Superior No. 6 ("S.6") labels additionally have:

1. An overall horizontal, rectangular format
2. Black, yellow, blue, and red printing ink
3. The lion's head facing to the left
4. The "N" of "MOVEMENT" correctly rendered
5. No periods (or "no full stops" in UK English) after any lines of text
6. The "R" of "FOR" to the right of "A" of "ABROAD"

See Peter Gosnell, "The Atlantic Clock Works of Birmingham, England, Revealed: Part 5: 'The Caledonian Registered' Movements," *Watch & Clock Bulletin* 65, no. 465 (September/October 2023): 333, Figure 9B.

Superior No. 7 ("S.7") labels additionally have:

1. An overall horizontal, rectangular format
2. Black, yellow, blue, and red printing ink
3. The lion's head facing toward the viewer with flowery "pansy" eyes; the lion's right paw rests on a cushion that extends over the edge of the shelf; the unicorn's front left leg also reaches over this same shelf.
4. The "N" of "MOVEMENT" correctly rendered
5. No periods (or "no full stops" in UK English) after any lines of text
6. The "R" of "FOR" above the "A" of "ABROAD"

See Peter Gosnell, "The Atlantic Clock Works of Birmingham, England, Revealed: Part 7: C. & H. Cartwright's Anglo-American Clocks," *Watch & Clock Bulletin* 66, no. 467 (January/February 2024): 48, Figure 2E.

Superior No. 8 ("S.8") labels additionally have:

1. An overall almost square format
2. Black, yellow, blue, and red printing ink
3. The lion's head facing toward the viewer with its right paw resting on a cushion that extends over the edge of the shelf; the unicorn's front left leg also reaches over this same shelf.
4. The third line of text reading "With Jerome's Bushed Movement"

See Peter Gosnell, "The Atlantic Clock Works of Birmingham, England, Revealed: Part 7: C. & H. Cartwright's Anglo-American Clocks," *Watch & Clock Bulletin* 66, no. 467 (January/February 2024): 49, Figure 3E.

Superior No. 9 ("S.9") labels additionally have:

1. An overall vertical, rectangular format with a curved bottom edge
2. Black, yellow, blue, and red printing ink
3. The lion's head facing to the left
4. The third line of text reading "ENGLISH FINISHED CLOCK"

See Peter Gosnell, "The Atlantic Clock Works of Birmingham, England, Revealed: Part 7: C. & H. Cartwright's Anglo-American Clocks," *Watch & Clock Bulletin* 66, no. 467 (January/February 2024): 51, Figure 4E.

3. These changes were puzzling because they would have incurred extra costs for no apparent reason or benefit.
4. Sonya L. Spittler, Thomas J. Spittler, and Chris H. Bailey, *American Clockmakers & Watchmakers*, vol. 3 (Fairfax, VA: Arlington Book Co., 2000), 295.
5. Seth Thomas Clock Co., *Seth Thomas Clocks, 1890 and 1891* (New York: John C. Rankin, Jr., 1890), 4.
6. Robert M. Marples & Sons, 57 Holborn Viaduct, London, England, *Illustrated Catalogue of Clocks, Watches, Vienna Regulators, Barometers, &c., &c.*, 1899, 83–85.
7. Chris H. Bailey, private communication with the author in October 2008.
8. "Superior No. 1" label: Gosnell, "The Atlantic Clock Works of Birmingham, England, Revealed: Part 3: 'Square Nut' Movements," 164–65, Figure 3H; "Superior No. 2" label: Gosnell, "The Atlantic Clock Works of Birmingham, England, Revealed: Part 3: 'Square Nut' Movements," 165, Figures 4B and 5B; "Superior No. 3" label: Gosnell, "The Atlantic Clock Works of Birmingham, England, Revealed: Part 3: 'Square Nut' Movements," 169–70, Figure 12C; "Superior No. 4" label: Gosnell, "The Atlantic Clock Works of Birmingham, England, Revealed: Part 5: 'The Caledonian Registered' Movement," 331–32, Figure 6B; "Superior No. 5" label: Gosnell, "The Atlantic Clock Works of Birmingham, England, Revealed: Part 5: 'The Caledonian Registered' Movement," 332–33, Figure 8; "Superior No. 6" label: Gosnell, "The Atlantic Clock Works of Birmingham, England, Revealed: Part 5: 'The Caledonian Registered' Movement," 333–34, Figure 9B; "Superior No. 7" label: Gosnell, "The Atlantic Clock Works of Birmingham, England, Revealed: Part 7: C. & H. Cartwright's Anglo-American Clocks," 48, Figure 2E; "Superior No. 8" label: Gosnell, "The Atlantic Clock Works of Birmingham, England, Revealed: Part 7: C. & H. Cartwright's Anglo-American Clocks," 49, Figure 3E; "Superior No. 9" label: Gosnell, "The Atlantic Clock Works of Birmingham, England, Revealed: Part 7: C. & H. Cartwright's Anglo-American Clocks," 51, Figure 4E.
9. "History," The Royal Warrant Holders Association, <https://www.royalwarrant.org>.
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11. Thomas J. Spittler, "Letter from America: The Caledonian Registered," *Clocks Magazine* 21, no. 5 (May/June 1998): 39; and "Research Activities and News," *NAWCC Bulletin* 40, no. 317 (December 1998): 753–54.
12. John Glanville and William M. Wolmuth, *Clockmaking in England and Wales in the Twentieth Century* (Marlborough, Wiltshire, England: The Crowood Press Ltd, 2015), 19–21.
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14. Alan and Rita Shenton, *The Price Guide to Collectable Clocks 1840–1940*, 2nd rev. ed. (Woodbridge, Suffolk, England: Antique Collectors' Club, 1990), 326.

About the Author

Peter Gosnell joined the NAWCC in 1997 and between 2001 and 2008 made yearly visits to the US to study the development of the Connecticut brass clock movement with the guidance of the late Dr. Snowden Taylor. Subsequently, Peter's research has focused on early industrialized clockmaking in England, with a number of articles on the subject published in the *Bulletin*.

A Time for Mourning Love

Misanthropy's a terrible place
 There are the looks of comfortable friends
 And shame in your inner core
 (Plus Molière would make you a joke)
 But consider contaminants
 Blackening nature's lungs
 And in rubble of war
 Consider innocents and body parts
 A loving attitude I'll admit
 Is a beautiful thing
 And I'm all for the kingdom when it comes
 But guns go blazing into classrooms
 And in other happy spots
 While truth is raped by thousands of lies
 Where is love in all of this
 If I'm too much
 Ask the creatures dying out
 Right whales for example
 Or fireflies or polar bears
 And in their jargon
 See if they wonder one by one
 Where is love in all of this

© RAYMOND COMEAU, AUGUST 2023

Human time, like most things, has a good and a bad side. It is the poet's job to address both. This poem speaks for itself, and it is enough to say that there are times when we become dissatisfied with the way we humans act. It may capture the sentiment of some of our members. Ray Comeau is a former associate dean of management studies and director of foreign language instruction for Harvard Extension School, where he still serves as a lecturer on courses dealing with the intersection of literature, philosophy, and management. He is a member of NAWCC Chapters 8 and 87 in his native Massachusetts. His email is comeau@fas.harvard.edu.

Geo. H. Taylor & Co. and Its Willard-Style Clocks

By Andrew Dervan, NAWCC Silver Star Fellow (MI)

INTRODUCTION

Geo. H. Taylor & Co. was a little-known clock company in Providence, RI, operating from 1877 to 1939. Occasionally a clock produced by the company turns up at a mart, auction house, or clock dealer. In his book on Willard timepieces, Paul J. Foley recorded Geo. H. Taylor & Co.'s 1882 advertisement for its "Willard Clock" in the Providence Business Directory.¹

Little-known companies are always an interesting research project. In 2008, I had investigated the company at the Rhode Historical Society but found no information and was temporarily disappointed. In 2010, when I casually mentioned my interest in the company to NAWCC member Kim St. Dennis, he said that he had acquired a Geo. H. Taylor banjo clock a few years prior. He completed genealogical research on the two brothers—George H. and William H. Taylor—who were partners in this company. Peter Nunes emailed me photographs of a Geo. H. Taylor & Co. banjo clock owned by a collector in Connecticut and also gave me a Geo. H. Taylor & Co. replacement mainspring container that sustained my interest in the company. In the meantime, a loose movement and another clock had turned up at auctions. In 2011 and 2012, I made two more visits to Providence and was able to locate significantly more

information on the two brothers and their partnership that led to a breakthrough in the research. More information on the company was uncovered at the NAWCC's Library & Research Center by searching *Jewelers' Circulars* in its archives. Using various Google search terms, I uncovered additional information on the brothers and the company. More recently, a few more clocks and loose movements have been seen at auctions.

BRIEF COMPANY OVERVIEW

In 1877, George H. Taylor formed the company under his name, and his younger brother, William, joined shortly afterwards. They sold watch and clock materials and optical goods, and made a limited number of weight-driven timepieces and regulators (Figure 1). Unfortunately, George died unexpectedly at age 38 in 1887. After George's death, William continued the business for another 52 years until his death in 1939. What makes this partnership interesting was their manufacture of weight-driven Willard-style presentation timepieces (banjo clocks), plain case banjo clocks, and regulators very late in 19th century when the only company manufacturing significant quantities of banjo clocks for businesses was E. Howard Watch & Clock Co. and possibly a few by Boston Clock Co. (Figures 2 and 3).² A number of companies made weight-driven regulators.³

WHO WAS GEORGE H. TAYLOR?

George H. Taylor was born on October 2, 1848, in North Adams, MA; his parents were Edward Taylor and Sophia A. (Brigham) Taylor. The Taylor family moved to Rhode Island sometime between 1860 and 1870. By 1870, George was working for and rooming with Joshua Gray, a Providence jeweler. George married Elizabeth Jane Neil; no record for their marriage was found in RI, so they were probably married in New York. They had three children: George N. (born on April 7, 1880), Jennie (born in 1882), and William H. (born in May 1887). Interestingly, their first child, George N., was born in New York City, so either his wife decided to go home for her first child's birth or George was spending a lot of time in New York City and she accompanied him.⁴ Tragically, William H. was born three months after George H. passed away. The family lived initially in East Greenwich, RI, moved to Providence, RI, living at 44 Sutton for four years (1881–85), and then moved to 8 Eighth St. in East Providence.⁵

There is no record that George ever applied for a license to open a business in Providence (a license was supposedly required by city ordinance) and the business never paid any city taxes between 1880 and 1890.⁶ The City of Providence has only five years of George H. Taylor's personal tax records. In 1881, he was taxed \$7 on \$500 of personal property; in 1882 and 1883, he was taxed \$14.50 for \$1,000 of personal property. In 1884, he was taxed \$17.40 for \$1,200 in real estate; in 1885, he was taxed \$14.40 for \$1,200 in real estate, although I could find no record that he owned any real estate there. In 1883, George was listed in the East Providence Town tax book, and over the years purchased multiple lots of land there.⁷ East Providence and Providence are two separate, adjacent cities.

Tragically, in February 1887 George died unexpectedly at age 38 while in Harlem on business, but his date of death is recorded as April 6, 1887. No Rhode Island death certificate exists for him because he died out of state, and the State of Rhode Island did not require death certificates prior to 1900. Elizabeth purchased a family grave plot in Riverside Cemetery in Pawtucket, RI, and George was buried there. She applied to the East Providence Probate Court to be appointed his estate's executrix; the Probate Court prepared a notice for the newspaper dated April 23, 1887, that anyone interested in becoming executor was to appear in court at 2 p.m. on May 9, 1887. Inside the request was a document that provided minimal details about George's death.

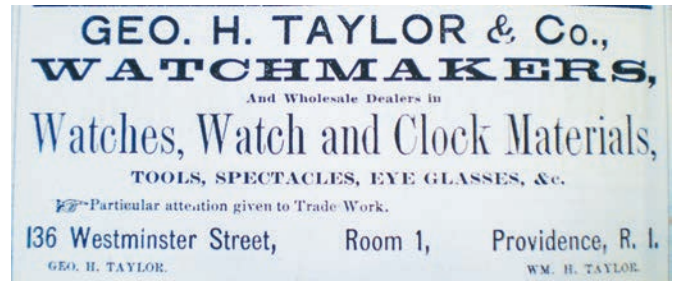


Figure 1. Initial company advertisement in the 1880 *Providence Business Directory*.

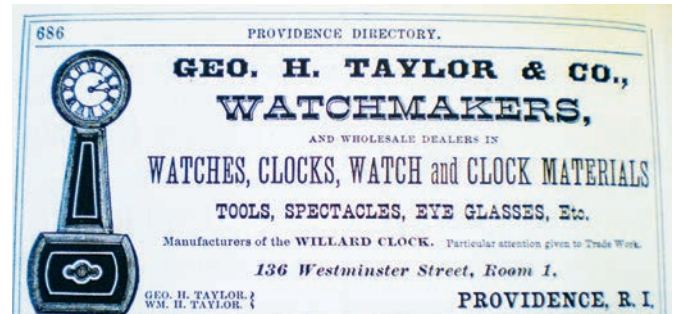


Figure 2. Note the timepiece image in this 1882 *Providence Business Directory* advertisement.



Figure 3. Advertisement from the 1910 *Providence Business Directory* that promotes Geo. H. Taylor & Co. as "Manufacturing Opticians."

On May 25, 1888, the Probate Court prepared another newspaper notice stating that Eliza Jane Taylor was appointed executrix, she had presented first and final settlement for his estate to the court, and interested parties should appear in court on June 11, 1888, at 2 p.m. The document contained a page of "Paid Out" expenses totaling \$5,740 (including a \$1,535 mortgage to Wilbur Jackson, a private banker and broker in Providence), a \$2,500 mortgage to George's sister Sophia A. Taylor, \$600 in notes to his other sisters Charlotte M. Taylor and Annie C. Taylor, and a "Received" amount totaling \$9,551.50 (personal estate, gain in inventory value, and interest from the estate). An appraiser completed an inventory (total value of \$8,216), noting the following items: four hanging clocks valued at \$30.00 each, circular

saw, two rifles, telescope, case, life insurance policy (\$2,500.00), and the value of the deceased's interest in business (\$5,500). The business amount was substantial, because if business was an equal partnership between William and George, each owning 50%, then the business was worth \$11,000—a sizeable amount of money in 1887. Although George died very young, his estate left his widow and children some money. Elizabeth filed documents in probate court for guardianship of their three young children.⁸ East Providence tax records have listings for George, George H.'s estate, and George H. Taylor heirs up through 1921; it appears some of the lots did not contain buildings.⁹

George's family continued living in East Providence. His older son, George N., and his daughter, Jennie, each married and lived in East Providence very close to their mother. Elizabeth Jane Taylor passed away at age 76 on December 12, 1926, and was buried in Riverside Cemetery in Pawtucket, RI. Later, George N. and his wife, William, and Jennie and her husband were also buried there.¹⁰

It appears none of George's three children were ever involved with the company when they became adults, except when George N. briefly managed the company when it was being dissolved in 1940.

WHO WAS WILLIAM HERBERT TAYLOR?

William H. Taylor was born on September 14, 1852, in North Adams, MA; his parents were Edward Taylor and Sophia A. (Brigham) Taylor. By 1870, William, his parents, older brother, Edward, and two sisters, Charlotte (older) and Annie (younger), were living in East Greenwich, RI. His father and brother were listed as "engravers" in various censuses. On November 25, 1879, William married Fannie Green Brown of Warwick, RI; Fannie was born on March 7, 1857, to John Clarke Brown and Ruth Green Howland. On their marriage certificate, William was listed as being 27 years old and Fannie was 20 years old. In 1880, their own child, Annie Elizabeth, was born. William and

Figure 4A. William and Fannie Taylor's home on Marion St. was featured on a postcard postmarked in 1913 and published by William A. Browning of East Greenwich, RI. COURTESY OF THE EAST GREENWICH HISTORIC PRESERVATION SOCIETY.





Figure 4B. William and Fannie Taylor's windmill and flower garden were featured on a postcard published by E. F. Henry of East Greenwich, RI. COURTESY OF THE EAST GREENWICH HISTORIC PRESERVATION SOCIETY.

Fannie lived in East Greenwich on Marion St. and later at 56 Rector St.¹¹

Prior to joining his brother, George, in the business in 1878, William was listed as a "salesman" in the Providence Business Directory.

As evident in East Greenwich tax records, William and Fannie began paying real estate and personal property taxes in 1880 and continued paying such until their deaths. They apparently owned two plots of land: one was in William's name and the other in Fannie's name. In 1900, Fannie was taxed \$101.25 for \$12,000 in real estate and \$1,500 in personal property. In 1924, Fannie was taxed \$402.60 based on \$1,800 in land, \$15,550 for a building, and \$1,000 in personal property. A house worth \$15,500 in 1924 must have been quite large. In 1939, William was taxed \$535.68 for three plots of land, including a wooded lot, and his house was valued at \$17,500.¹²

The first mention of the New England Watchmakers Club was in the May 1907 *Keystone*, which also listed William as a director of the club.¹³ William H. was cited again as a director of the New England Watchmakers Club in the March 1911 *Keystone*. The clubhouse was located in the Franklin Union at the corner of Appleton and Berkeley Streets, in Boston MA.

The East Greenwich [RI] Historic Preservation Society's collection includes two postcard images of William and Fannie Taylor's home and their flower garden and windmill (Figure 4). William H. Taylor's home once stood on Marion St. An 1895 map shows that this house had been set back from Revolution St., but had likely burned down and was replaced by the home at 41 Marion St. William H. and Fanny G. Taylor owned it from 1912 to 1921. Their expansive, beautiful garden was located on Marion St. and ran through to Rector St. Later their address was changed to 56 Rector St.¹⁴

Fannie G. died on April 28, 1935, at age 78, and William H. died on December 19, 1939, at age 87. Their only daughter died in June 1939. Unfortunately, William had canceled his will that he prepared on May 26, 1887, so he died intestate, which necessitated a significant probate action to settle his estate and all company activities.

William's probate file provided valuable information and showed that he was still actively engaged in a profitable business until his death. The Industrial Trust Co. (Rhode Island's largest bank at the time) held all of the estate's monetary assets until the company's and William's assets were inventoried and later dispersed. The business inventory totaled \$14,036. William's assets included \$2,927 of Geo. H. Taylor & Co. merchandise; office furniture and equipment valued at \$300; a company checking account with \$1,489; three life insurance policies totaling \$7,688; accounts receivable of \$517; household furniture and effects valued at \$1,049; a small amount of cash and preferred stock, and a 1932 Packard Sedan valued at \$25 (he owned a classy car!). *Rhode Island Pendulum* published William's obituary and noted that William and George had been a "watch and optical findings dealer," a company that sold watch and optical items that William had continued after George's death. William owned summer property in Quonset Point and was involved with the summer community there, was a charter member of the East Greenwich Yacht Club, and was active in St. Luke's Church.¹⁵

William's personal real estate was valued at \$12,000. On December 27, 1939, George N. Taylor, George H. Taylor's son, petitioned East Greenwich's Probate Court to become custodian to carry out the final liquidation of Geo. H. Taylor & Co. Interestingly, George's three children (George N., Jennie, and William H.) eventually inherited what remained of William's estate.¹⁶

Fannie, William, his parents (Edward and Sophia), his brother Edward, and his sisters (Annie and Charlotte), his daughter (Annie), and her husband are buried in Glenwood Cemetery in East Greenwich. There is a large stone tombstone with "Taylor" on one side and all of their names with their birth and death dates on the other side. Small, individual headstones with their initials mark where each is buried (Figure 5).¹⁷

HISTORY OF GEO. H. TAYLOR & CO.

By 1873, George H. Taylor was listed in the Providence Business Directory as a watchmaker, and over the years he had different addresses. The 1877 Providence Business Directory contains the first listing for "Geo. H. Taylor & Co." located at 136 Westminster St. in the business district. In 1878, William H. Taylor joined the company, and the company was listed as "Watchmakers." In the 1880 Business Directory, the company has an advertisement with "Watchmakers" in large, bold print and "Watches, Watch and Clock Materials" in slightly smaller print (see Figure 1). In the 1882 Business Directory, the company's new advertisement contains an image of a banjo clock (see Figure 2) and noted that they were "Manufacturers of the Willard Clock," clocks based on the design by Simon Willard. The same advertisement continued until 1885.

After 1885, the company's ad did not include a clock image (see Figure 3) and instead promoted itself as "Watchmakers and Manufacturing Opticians." These advertisements continued until 1940. After George's death, William continued the business as "Geo. H. Taylor & Co." In 1891, he temporarily moved to Rooms A, B, and C, Butler Exchange, 2nd floor, because the building at 136 Westminster (at the corner of Westminster and Dorrance) was severely

Figure 5A. The Taylor family's headstone; B. William Herbert Taylor's grave marker. AUTHOR'S PHOTOS.





Figure 6. Entrance to 204 Westminister St., where George and William's business was located. AUTHOR'S PHOTO.

damaged by a fire. Later, William moved to 140 Westminister St. (next door). In 1895, Westminister St. was renumbered and the address became 204. The building where he leased an office at 204 Westminister St. still remains (Figure 6). Table 1 shows the company's locations.¹⁸

The February 1883 issue of *Jewelers' Circular and Horological Review* had the first listings of Geo. H. Taylor & Co. in its trade references section: "Taylor, Geo. H. & Co. - Watchmaker and Wholesale Dealers in Watches, Clocks, Watch & Clock Materials, Tools, Spectacles, Eye Glasses, & C. Particular attention given to their trade work 136 Westminister Street (Room I), Providence, R. I." Other issues of *Jewelers' Circular* had the same reference, except the address was updated.

Surprisingly, this small Rhode Island company created an advertisement "Workshop Notes for Jewelers & Watchmakers" that was published by the national *Jewelers' Circular* in 1892.¹⁹ In 1910, the company placed a series of advertisements in issues of *Optical Age* that included the text "Optical Materials and Supplies" in large type.

In 1893, the company signed a petition, along with many other watch suppliers, that it would not purchase watches or watch cases from Dueber, the defendant in the New York Supreme Court case of *Dueber Watch Co. v. Fahys Watch Co.*, a patent infringement lawsuit.²⁰ Instead, Geo. H. Taylor & Co. would purchase watch cases from the plaintiff, Fahys.

Here are some highlights of people and events associated with Geo. H. Taylor & Co.:

- Andrew D. Wilson was the company's factory foreman from 1880 to 1883, when he left and eventually established a successful business as a dealer in watches, clocks, jewelry, and spectacles at 235 Main St., Providence, RI. He had acquired clockmaking experience and probably was hired by Geo. H. Taylor & Co. to set up the clockmaking operation; later he worked for Walter Durfee.²¹
- Geo. H. Taylor & Co. employed several optical salesmen. Edward A. Bradley was listed as the company's head optical salesman in 1910.²²
- In August 1893, George H. Waterhouse, a buyer from Geo. H. Taylor & Co., was visiting Chicago and toured the World's Fair.²³
- The November 1910 issue of *Jewelers' Circular & Horological Review* notes that Robert O Bissell, the

YEAR	COMPANY	ADDRESS
1877-1889	George H Taylor & Co	136 Westminister St., Room 1
1891	"	Rooms A, B & C, Butler Exchange, 2d Floor
1892-1895	"	140 Westminister St.
1896-1930	"	204 Westminister St.
* Westminister St. renumbered in 1895; 140 becomes 204		
1882-1884: Willard Clocks		
1912-1930: Opticians		

Table 1. Geo. H. Taylor & Co. Business Locations

CASE STYLE	SERIAL NO.
Unique unsigned Plain Timepiece - glass painted like mahogany panels	24
Presentation Timepiece - signed dial	32
Unsigned Plain Timepiece with finial & replaced naval scene glasses by Lee Davis - original glasses painted like mahogany panels	42
Plain Timepiece - signed dial	45
Unsigned Plain Timepiece	72
Lyre clock - dial signed Elisha Durfee	97
Unsigned Regulator - papered dial	105
Regulator - signed dial	111
Loose Movement	126
Unsigned Plain Timepiece	180
Unsigned Plain Timepiece	189
Unsigned Plain Timepiece	Unknown

Table 2. Observed Geo. H. Taylor & Co. Movement Serial Numbers

company's head watchmaker, was convalescing from an attack of rheumatism.

- The December 1917 issue of *Jewelers' Circular & Horological Review* has an article about a massive Liberty Bond drive that raised over \$5.2 million. It was supported by the Providence Chamber of Commerce, bankers, labor organizations, and watch, jewelry, and silversmith organizations. William H. Taylor of Geo. H. Taylor & Co. is listed as a contributor.²⁴

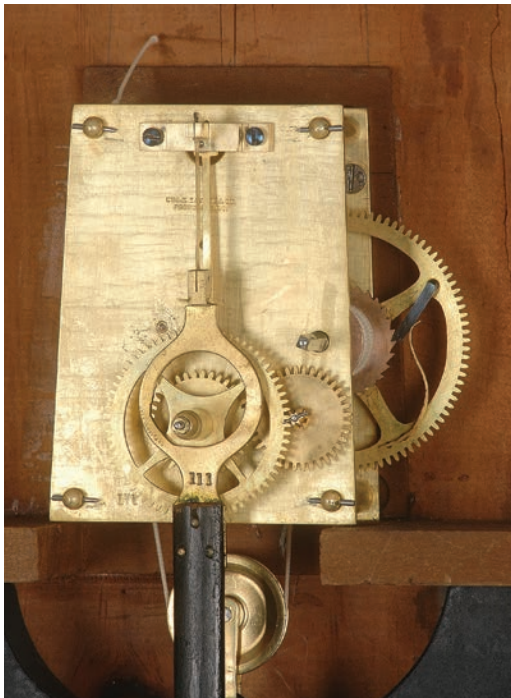
It appears that William was still actively conducting the business right up until his death. A probate record shows he had three watches in for repair, and his estate was charged with completing their repair by another watch repairer. The company had a significant merchandise inventory (\$2,927), a checking account balance of \$1,489, and accounts receivable that totaled \$517, with \$286

accruing after William passed away. The Probate Court appointed a custodian—George N. Taylor, George H.'s son—who temporarily managed the company in January 1940 while the final inventory value was determined and everything liquidated.²⁵

CLOCK PRODUCTION

Initially, Geo. H. Taylor & Co. focused on watch sales, watch repair, watch materials, and optical sales. In 1882, a Providence Business Directory advertisement contained a timepiece image and a notice that the company was a "Manufacturer of the Willard Clock."

I have seen two loose movements and eleven Geo. H. Taylor clocks in three case styles. Most of the company's clock dials were unsigned; however, four signed dials have been observed (a presentation timepiece, a plain timepiece,



◀ **Figure 7.** Geo. H. Taylor movement. COURTESY OF PAUL A. FOLEY.



◀ **Figure 9.** Serial number on a Geo. H. Taylor movement in a presentation timepiece. COURTESY OF MARQUIS AUCTIONS.

▼ **Figure 10.** George Hatch movement. AUTHOR'S PHOTO.



Figure 8. Geo. H. Taylor movement signature. COURTESY OF PAUL A. FOLEY.



and two regulators) that appear legitimate. Table 2 shows clock descriptions and serial numbers.

The company's weight-driven movement is very distinctive: it has trapezoidal plates similar to movements produced by George Hatch for his regulator clocks in North Attleboro, MA. The movement is 4 1/4" tall, 2 1/2" wide at the top, and 3" wide at the bottom and is stamped "Geo. H. Taylor & Co. / Providence, RI" in two lines on the front plate under the crutch. The movements have a serial number stamped either on the lower left front or back plate (Figures 7-10). Many of the clocks have the serial number stamped on both the movement and the bottom of the keystone, just above where it connects to the pendulum rod.



Figure 11A. Presentation timepiece. COURTESY OF MARQUIS AUCTIONS. **B.** Geo. H. Taylor signed dial on presentation timepiece. COURTESY OF MARQUIS AUCTIONS.

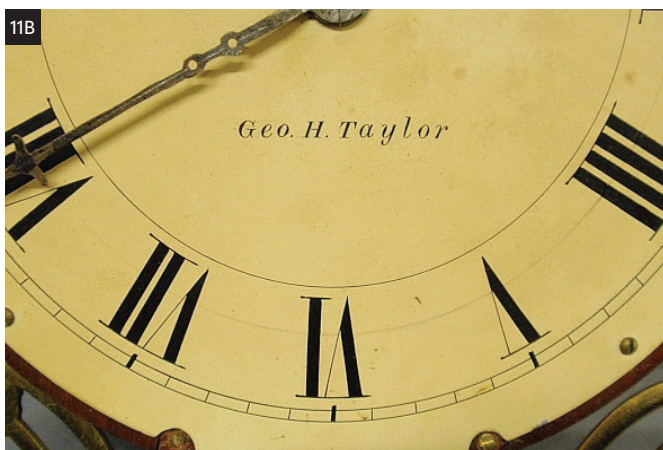


Figure 12. Plain timepiece at the American Clock & Watch Museum in Bristol, CT. AUTHOR'S PHOTO.

I did extensive searches on Ancestry.com and in city directories trying to locate a connection between Geo. H. Taylor and George and John Hatch's clock business, but I was unsuccessful. North Attleboro, MA, and Providence, RI, are very close—roughly 13 miles apart. John B. Hatch continued his father's business until early 1880s.²⁶ I am speculating that Geo. H. Taylor & Co. could have purchased clockmaking machinery from the Hatches and offered employment to some workers when John closed the business.

I have observed three clock designs of Geo. H. Taylor & Co.: (1) a crossbanded presentation timepiece with decorated reverse-painted glasses (Figure 11); (2) a plain timepiece with half-round frames and black and gold reverse-painted glasses (similar to unsigned Attleboro timepieces produced by George Hatch) (Figure 12); and (3) a rosewood grained-finish regulator (Figure 13). The plain timepiece cases are typically 29" tall, which is similar in height to an E. Howard no. 5 banjo clock. The presentation timepiece has typical barbed timepiece hands,²⁷ the unsigned timepieces have spade hands, and the regulators have moon-style hands.

Clock sales possibly continued to about 1892 when the company moved to its new location at 140 Westminster. Based on the serial numbers of observed clocks, the company produced around 200 clocks; the highest confirmed serial number is 189. However, I speculate that clocks were probably produced between 1882 and 1887, due to George's death in 1887. The company also retailed clocks from other manufacturers. It ordered a no. 11 (keyhole regulator) from E. Howard Watch & Clock Co. on May 5, 1897, for delivery to a customer in Bristol, RI.²⁸

In the 1899 Providence House Directory, the company placed an advertisement with "Watchmakers" in bold print and listed its offerings in small print.

OTHER BUSINESS OFFERINGS

Besides the horological business component (clock and watch sales, clock and watch repairs, and watch materials), there was a significant optical focus (opera and field glasses, spectacles, and eye glasses). The company had several optical salesmen. The optical business started by 1880 and probably grew over time as the clock production was phased out and demand for watch materials declined. In the 1920 Providence, RI, Business Directory, the company's advertisement promoted "Optical Goods and Prescription Work."



► **Figure 13A.**
Regulator. COURTESY
OF PAUL A. FOLEY.

▼ **Figure 13B.**
Signed regulator
dial. COURTESY OF
PAUL A. FOLEY.

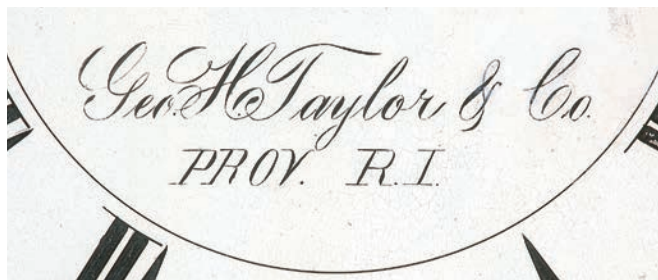


Figure 14. "G.H.T. & Co. Main Springs" from Geo. H. Taylor & Co. COURTESY OF PETER NUNES.



An important line of products was watch materials. One example was replacement mainsprings (Figure 14). The company sold a container with a dozen 12-size replacement mainsprings. The container's label states that "each spring stamped and warranted."

The company was a jobber for the Bannatyne Watch Co., which operated from 1905 to 1911 in Waterbury, CT. It made low-cost, non-jeweled watches that sold for \$1.50. In 1913, E. Ingraham Co. of Bristol, CT, purchased the Bannatyne Watch Co.²⁹

Providence, RI, had a significant number of jewelers and many companies that manufactured a variety of silverware. Geo. H. Taylor & Co. carved out a successful niche by supplying horological and optical materials to the trade in the city.

CONCLUSIONS

George H. Taylor established his watch, clock, and optical supply business in 1877, and his brother William H. joined the company shortly afterwards. George died in 1887 at the young age of 38, and William continued the business alone for 52 years until his death in 1939. Based on the brothers' property holdings and probate records, it is clear that the business was successful. For clock

collectors, their business was particularly interesting because it manufactured three variations of Willard timepieces after nearly all other companies had stopped making them. I would be interested in hearing from collectors who have movements or clocks signed "Geo. H. Taylor & Co." Please contact me via editor@nawcc.org.

Acknowledgments

A special acknowledgment goes to those who provided assistance with this article: Kim St. Dennis for his genealogical research information, John Delaney, Paul J. Foley, David Howard, Peter Nunes, Marquis Auctions, East Greenwich Town Clerk, Reference Librarian at the East Greenwich Public Library, the East Providence Town Clerk, East Providence Public Library, NAWCC Fortunat Mueller-Maerki Library & Research Center, Providence City Archives, Providence Public Library, Rhode Island Historical Society, and the Rhode Island State Archives.

Notes and References

1. Paul J. Foley, *Willard's Patent Time Pieces* (Norwell, MA: Roxbury Village Publishing, 2002), 319.
2. Foley, *Willard's Patent Time Pieces*.
3. See Tran Duy Ly's books on American clock companies, where he noted that a few companies offered weight-driven clocks and regulators: Seth Thomas, New Haven, and Waterbury.
4. I don't believe they lived there long or established a business in New York City, which was major hub for watch companies. Salesmen visited to buy watches or watch materials.
5. Birth and marriage information is from the Rhode Island State Archives, and census information is from Ancestry.com.
6. City of Providence records and conversations with the city's archivist about the city business license. Little information was discovered at the Rhode Island Secretary of State's office and nothing indicating that the company was incorporated.
7. Tax records are from the Providence, RI, city archives, and George H. Taylor probate files, nos. A571 and A569, East Providence, RI, Town Clerk.
8. George H. and Elizabeth's younger son, William, had some mental health problems. His World War I draft notice indicated that he was rejected for service due to mental issues (World War I Draft Record, Ancestry.com). In 1905, Elizabeth filed documents in probate court seeking permanent guardianship for him. After her death in 1926, George, Jennie, and Jennie's husband, William Anthony, filed documents in probate court to assume William's guardianship.
9. George H.'s date of death was found on Ancestry.com; see the George H. Taylor probate files, nos. A571 and A569, East Providence, RI, Town Clerk, and the East Providence Town Tax Book, East Providence Public Library.
10. Elizabeth Jane Neil's death certificate is in the Rhode Island State Archives. Details about the family were found in census information from Ancestry.com; probate records

for Elizabeth J. Taylor (2152, book 5, p. 69), East Providence, RI, Town Clerk; probate records for William H. Taylor (1333, book 3, p. 163), East Providence, RI, Town Clerk; and probate records for George N. Taylor (6922 book 12, p. 91), East Providence, RI, Town Clerk.

11. Family history and census details are from Ancestry.com; marriage information is from the Rhode Island State Archives.
12. East Greenwich, RI, tax records are from the Rhode Island Room, East Greenwich Public Library.
13. *The Keystone* (March 1911): 407.
14. Details about William and Fannie Taylor's home, garden, and windmill were found at the East Providence [RI] Historical Preservation Society.
15. William and Fannie Taylor's death certificates and probate files from the Town Clerk of East Greenwich, RI (William H. Taylor probate file no. 1435 and Fannie G. Taylor probate file no. 1352); East Greenwich Graveyard Index; and William H. Taylor obituary, *Rhode Island Pendulum*, December 21, 1939, 1.
16. William H. Taylor probate file no. 1435.
17. Cemetery Index, Rhode Island Room, East Greenwich Public Library.
18. Various Providence City Directories, Providence City Archives.
19. "Workshop Notes for Jewelers & Watchmakers," *Jewelers' Circular & Horological Review*, 1892.
20. *Dueber v. Fahys*, New York Supreme Court, 1893.
21. *Industries and Wealth of the Principal Points in Rhode Island* (New York: A. F. Parsons Publishing Co., 1892), 156.
22. *Optical Age*, published by *Jewelers' Circular & Horological Review* (1910): 912; see also *Keystone Magazine of Optometry*, vol. II (1910): 1,079.
23. *Jewelers' Circular & Horological Review* (August 9, 1893): 26.
24. *Jewelers' Circular & Horological Review* (May 30, 1917): 65.
25. William Taylor probate file, no. 1435, East Greenwich, RI, Town Clerk.
26. George Hatch started producing clocks around 1848 and was listed in the Massachusetts Directory of 1853–1856 as a clockmaker in 1853. He continued until the 1870s when his son, John B., took over. John B. was listed as a clockmaker until 1882. See Foley, *Willard's Patent Time Pieces*, 263, 264.
27. Presentation timepieces used nicer hands with barbed tips compared to plainer spade hands. See Foley's *Willard's Patent Time Pieces* for examples of various barbed hands used on presentation timepieces and spade hands on E. Howard banjos.
28. E. Howard Watch & Clock Co. records at the Smithsonian Institute and the NAWCC Library & Research Center.
29. Bannatyne Watch Co., <https://pocketwatchdatabase.com/guide/companies/bannatyne-watch-co>, accessed December 28, 2023.

About the Author

Andy Dervan began collecting antique clocks in 1997 and joined the NAWCC. He found clock collecting to be a fascinating hobby, and his principle collecting interest is 19th- and 20th-century weight-driven clocks, particularly banjo clocks.

Researching the manufacturing histories of various makers and companies was more challenging than simply collecting; he has published many articles in the *Watch & Clock Bulletin*, American Clock and Watch Museum's *Electronic Timepiece Journal*, and *Clocks Magazine*. In 2011, he retired from DuPont Performance Coating, volunteered at The Henry Ford, and continues his horological research. In 2011, he became an NAWCC Fellow, in 2016 he was awarded the NAWCC's James W. Gibbs Literary Award, and in 2017 he became an NAWCC Silver Star Fellow.

MONTHLY
News & Updates



NEWSLETTER

February 2024

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Die Wand- und Bodenstanduhren der Habsburgermonarchie 1780–1850

(The Wall and Floor Clocks of the Habsburg Monarchy 1780–1850)

Book review by Bernhard Huber (GER)

When Stephan Andréewitch bought his first “Viennese” wall clock in the center of Budapest in 1980, he was already fascinated by the elegant shape and the fine moldings of the case as well as the unpretentious enamel dial with gold ring. At the 30th anniversary of his company in 2009, he decided to write about the wall and floor clocks of the Habsburg monarchy. He was able to win Paul Archard, managing director of Derek Roberts Antiques in England, as co-author. The result is a massive publication weighing 15 lb (6.8 kg), which has just been completed thanks to Alexander Graef’s significant contribution since 2018.

The first chapter of Volume 1 provides a concise introduction to the historical development of Habsburg clockmakers from the 18th century onwards and the reforms of the Habsburg Emperor Joseph II to liberalize the economy. The acquisition of the master license was made easier for craftsmen and there were no longer restrictions on the number of masters, journeymen, and apprentices. The arrival of Geneva clockmakers and manufacturers of clock components in Vienna in 1789 and the foundation of a clock factory in 1791 was also an important step. Not only innovative, simple case designs but also technically sophisticated precision movements and compensation pendulums appeared from 1800 onwards.



Die Wand- und Bodenstanduhren der Habsburgermonarchie 1780–1850

by Stephan Andréewitch, Alexander Graef, Paul Archard, 2023, 2 vols., 1,328 pages, 1,000+ color illustrations, 9 1/2"x11", hardcover, German language. ISBN 978-3-89790-616-7. Available from www.arnoldsche.com, www.andreewitch.com, and amazon.de, \$480.

Chapter 2 presents biographies of 41 historically leading master craftsmen, with meticulous details on 68 pages, starting with Josef Binder and ending with Franz Zajicek. This compilation is a unique Who’s Who of the most important Viennese master clockmakers of the 18th and 19th centuries, as it was never published before.

Chapter 3 explores the achievements of clockmaking in the Habsburg Empire at the trade exhibitions in Vienna, Prague, and Budapest as well as at the World Exhibitions in London in 1851 and in Vienna in 1873. Chapter 4 is dedicated to the formal development of clock cases for wall and floor clocks as well as the technology of clock movements. The explanations are intended as an introduction. Illustrations are used to discuss in detail the development of clock cases for Viennese wall clocks from the three-part lantern clock to the roof clock and the Biedermeier clocks for the period from 1780 to the late period after 1840.

Since this publication is not a professional publication on clock technology and its development, movements are only discussed briefly. Their design is characterized by the individuality of the masters of that period. Illustrations are used to briefly discuss the aspects of run time, driving force, winding, pendulum, movement construction, escapement, complications, dials, hands, and bezels. However, other publications are better suited for an in-depth study of Viennese clock technology.

The next chapter contains a selection of 33 privileges for the period 1820–1850, relating to large and small clocks, clock cases, escapements, and so on. Privileges were granted by the emperor and correspond to today's patents.

The central chapter of the Volume 1 comprises almost 500 pages with an extensive compilation of Viennese wall and floor clocks—a massive catalog. A total of 398 high-quality and unusual clocks have been collected with great effort, including previously unpublished clocks. Not only Viennese masters are presented, but also clocks from Habsburg provinces or clocks without a maker's name. Up to four pages with brilliant color photographs are used for each clock. Philipp Franz Fertbauer (1763–1820) is represented with over 15 clocks. The clocks are arranged chronologically, making it easy to follow the stylistic development of the clock cases as you browse through the book. Volume 1 ends with a helpful index and 1,441 footnotes as well as an extensive bibliography with approximately 180 entries.

Volume 2 is the result of 15 years of research on watchmakers active in the Habsburg monarchy between 1600 and 1900. It covers not only master watchmakers but also journeymen, apprentices, manufacturers, and craftsmen working in the field. Although an attempt was made to compile watchmakers from all parts of the empire, the focus is on the greater Vienna area. The starting point was the lists compiled in the 1920s by Rudolf Kaftan and Julius Höfer. In addition, data from Wejdom Claterbos and Josef Lad were consulted.

The focus was on the period 1750–1850 as the most important creative era of the Viennese masters. In addition to the basic data (name, date and place of birth, date and place of death, job title), the entries also contain information on training, dates of apprenticeship, citizenship, participation in exhibitions, trade license, and so on.

A unique feature of this 560-page directory with around 14,000 names is the citation attached to each entry. In this perfect and meticulously compiled form, the directory fulfils today's requirements for a scholarly work and thus facilitates further research. Unfortunately, references have so far been missing in all other published reference works for clockmakers, such as Juergen Abeler, Baillie/Brian Loomes, or Tardy.

The preface to Volume 2 indicates that research is to be continued. Ideally, an index would also list all known pieces of the respective clockmaker (e.g. from auction catalogues or collections). This is an invaluable advantage offered by Juergen Abeler. The updated watchmaker directory should also be published on the website of its author (www.andreewitch.com).

After 15 years of tireless research, an impressive study is now available that surpasses everything that has been published on Viennese wall and floor clocks to date. Highlights are the monograph with previously unpublished material and the unique catalog section. Above all, the directory with its 14,000 clockmakers is an amazing source of information. This publication will become the standard work for Viennese wall and floor clocks for decades to come and the reference work for collectors, antique dealers, and museums.

The Style of Time: The Evolution of Wristwatch Design

Book review by Brad Duppstadt (PA)

I've never particularly enjoyed reading about historical events, but as an avid watch enthusiast I read Mara Cappelletti's *The Style of Time*. I'm happy to report that if you aren't a history buff but love watches, then you will thoroughly enjoy the read. I wouldn't recommend it as a carry-on for your next flight but rather as the centerpiece on your coffee table due to its size.

The author takes the reader on a journey beginning in the early 1900s all the way through the first decade of the 2000s. Each chapter, or decade, begins with a brief narrative exploring fashion, culture, and the economic climate prior to highlighting the most important watch manufacturers, innovations, and production methods during that time period. To conclude each chapter, several of the most iconic watch models are listed with corresponding photos and additional details. These photos capture not only the watches themselves, but the celebrities of the time who wore them.

On multiple occasions I found myself contemplating what it would have been like to live during each period. What type of pocket watch would I have owned? How would I have viewed the "quartz crisis"? It was fascinating to learn how wristwatches (and marketing) supported human endeavors such as making the first transatlantic solo flight, climbing Mt. Everest, and walking on the moon. Would I have preferred wearing aviation- or diver-inspired designs as these events unfolded?

It's hard to believe how many truly great designs and models emerged during the 1950s from notable brands such as Omega, Breitling, Blancpain, IWC, and Rolex. The same can be said about the 1970s when Gerald Genta designed many of his infamous styles of stainless steel cases and integrated bracelets. These can still be seen today on the Audemars Piguet Royal Oak, the Patek Philippe Nautilus, and the IWC Ingenieur. It is remarkable that they all are even more popular today. I was surprised



The Style of Time: The Evolution of Wristwatch Design
by Mara Cappelletti, 2022,
272 pages
200 color illustrations,
11"x12", hardcover.
ISBN 978-1-78884-195-5.
Available from
www.accartbooks.com/us, \$65.

to learn the first annual calendar model wasn't introduced until 1996 when Patek Philippe won the Watch of the Year Award in Switzerland.

Cappelletti finishes with a very brief summary highlighting how technology has changed, but the mechanical movement in a wristwatch has won out: "This is a paradox of the watch industry; if the watch seems to have lost its primary function, it still maintains its role as a luxury accessory." Further, "it is not simply a question of luxury as a status symbol, but as a search for creative and cultural excellence." I think she hits the nail on the head as many of us continue to search for that next watch, celebrate our next milestone, and continue to enjoy the hobby with others. I look forward to getting a chance to answer some of my own questions, in real time, as technology and culture continue to evolve.

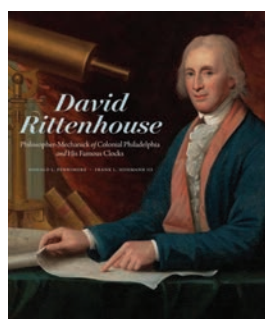
David Rittenhouse: Philosopher-Mechanick of Colonial Philadelphia and His Famous Clocks

Book review by Bruce Forman, NAWCC Fellow (IN)

David Rittenhouse is arguably the best-known American clockmaker to have worked during the colonial time period. His achievements are legendary, as he made two mechanical computers before the American Revolutionary War to predict the motions of the heavenly bodies. He also built astronomical regulators, musical clocks, and surveying instruments. Several books have been written about this man's life, and countless articles have been published in periodicals since his death in 1796. So, why has a new book about David Rittenhouse been written when there appears to be little left to write about this great man?

The answer to this question is that although David Rittenhouse has been examined for his many talents as a colonial surveyor, mathematician, scientist, astronomer, and patriot, there has never been a detailed examination of this man as a clockmaker! Many readers may find this hard to believe, but it is true. Although a few of his clocks have been photographed, most David Rittenhouse clocks are still in private hands or reside in museum reserve collections, making them difficult to find and examine. The authors of this newest book on David Rittenhouse have now swung open these long-closed doors to expose the wide range of clocks that this man was building.

The book begins by examining David Rittenhouse and how he relates to the other 18th-century craftsmen who pursued scientific investigations. Details are also given about his family ancestry and how the Rittenhouse family founded the first paper mill in America. David's father was a farmer who lived in Norriton Township, PA, but David Rittenhouse is said to have been a self-taught



David Rittenhouse: Philosopher-Mechanick of Colonial Philadelphia and His Famous Clocks by Donald L. Fennimore and Frank L. Hohmann III, 2023, 272 pages, 9 1/2"x11 1/2", hardcover. ISBN 978-0-300-27295-6. Published by Winterthur Museum, Garden, and Library, distributed by Yale University Press, available from [amazon.com](https://www.amazon.com), \$75.

clockmaker. The authors point out that he was probably influenced by the clock movements he saw made by local clockmakers and several examples are shown.

David Rittenhouse was propelled to the status of living legend when his interest in astronomy led him to construct two mechanical orreries. Hence, a full chapter in the book is devoted to the history of orreries, ending with an analysis of the two orreries built by David Rittenhouse. In later life, he became a patriot of the American Revolution, State Treasurer, and finally the director of the Philadelphia Mint. If you have never read about David Rittenhouse, then you should find the historical section of this book of some interest.

Benjamin Rittenhouse was trained by his older brother, David, and worked as a journeyman clockmaker in his shop for many years before starting his own clockmaking

HOROLOGICA

business. David is also believed to have had several apprentices at different times, but most appear to have left his shop after reaching maturity. Many of these are only associated with Rittenhouse based on their name being scratched onto the surface of a dial's back. Still, the overall production of David Rittenhouse clocks appears to be small, and his clocks are difficult to find to research. Compounding this problem is that David Rittenhouse clocks have been faked for nearly 150 years. Many of these fakes have now become genuine antiques in their own right. The authors talk about some of the fake Rittenhouse clocks they encountered and make comparisons of their engraved nameplates.

The authors of this new book eventually found 67 clocks signed by David or Benjamin Rittenhouse that they

deemed genuine. They then selected 10 examples made by each brother to be fully cataloged in the book. This catalog includes a full physical description of the clock case, dial, and movement. In addition, each element is photographed in color and many of these illustrations are full-page size. Most clock movements are photographed with their dials removed so that the intricate mechanical details normally hidden by the dial are exposed. This type of detailed photography is quite challenging, and it must have taken some diplomacy to convince the owners of these valuable clocks to allow partial disassembly of each clock illustrated. However, this is one reason why it is unlikely that any future book on this subject will be forthcoming, since the bar has been raised so high. If you have any interest in David Rittenhouse and his clocks, then this book is a must read.



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Chapter Highlights

Total Membership on December 31, 2023: 8,605 • First Accession Number on January 10, 2024: 1888043

Chapter reports must be received by the end of the working day (5 p.m. Eastern) on the following date to appear in the next published issue: Monday, March 11 for the May/June 2024 issue. Submission guidelines are available at nawcc.org/publications/chapter-highlights-submission. Send reports to chaphi@nawcc.org. For reporting questions, email chaphi@nawcc.org or call 717-684-8261, ext. 207.

CALIFORNIA

71. SACRAMENTO VALLEY

LOCATION: Shepard Garden and Arts Center, 3300 McKinley Blvd., Sacramento, CA 95816

WHEN: Fourth Sunday of January, March, May, July, September, and November unless otherwise stated.

MEMBERSHIP INFORMATION: Chris Johnson, 530-433-0084

EMAIL: mysterydriver@sbcglobal.net

WEBSITE: <https://new.nawcc.org/index.php/chapter-71-sacramento>

NOVEMBER MEETING: The doors opened at 9:30 with 25 members and four guests in attendance. After a good mart, the meeting was called to order by Vince Angell who began by introducing our three new members: Jamie Spaulding, Richard Larrouy, and Bryon Brooks. He also introduced our guests: Grace Frasthe and her grandson, Tiberious, and Steve Sharp.

PROGRAM: The program was Bring and Brag on Ingraham clocks. There was a terrific assortment of beautiful and unique clocks on display.

Dennis Rieke showed a lovely Ingraham belonging to his family. Chris Johnson brought two clocks: a calendar wall clock Dew Drop, and a beautiful blue and white ceramic clock. Vince Angell brought two clocks: an alarm clock with box called "Indian," and a wall clock circa 1871 called "Iota." Ron Hoops brought a very nice variety of alarm clocks and a Grecian shelf clock. Ken Rothaus brought



Chapter 71 Vice President Ken Rothaus showing one of his many Bring and Brag clocks.

four small alarm clocks, a clock in its original box, a desk clock from the 1930s, and a cathedral shelf clock. Thank you, Ken, for always bringing some of your favorite clocks to share with the members.

We continue to come up with ideas to grow our Chapter. Having these wonderful Bring and Brag programs inspired many members to participate. We welcomed three new members at this meeting. —Phyllis Angell

COLORADO

21. COLORADO

LOCATION: St. Michael and All Angels' Episcopal Church, 1400 S. University Blvd., Denver, CO 80210

WHEN: Fourth Monday of each month, 7 p.m., except July and December

MEMBERSHIP INFORMATION: David Gies

EMAIL: nawcc21@gmail.com

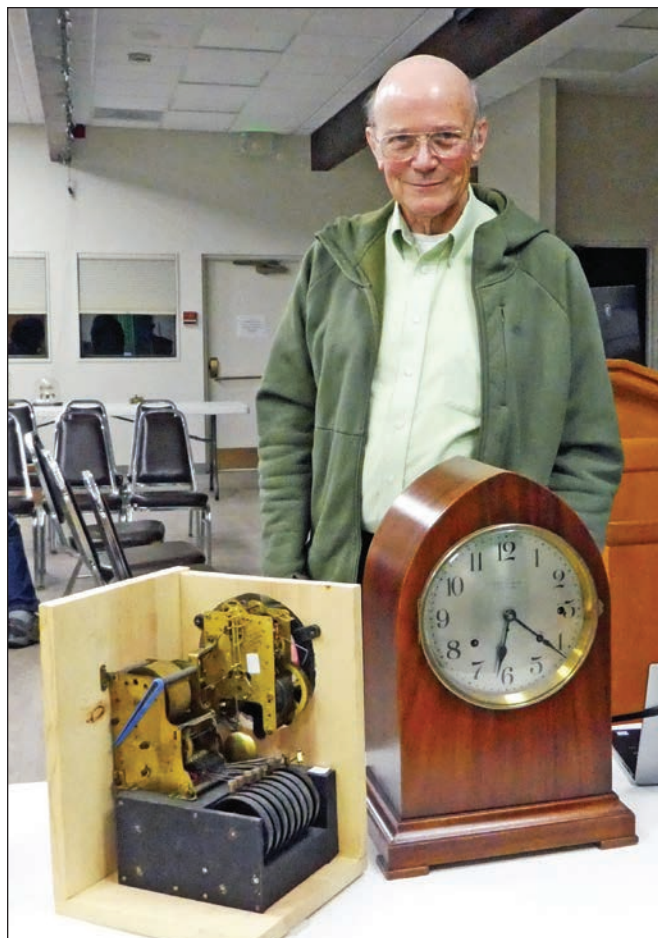
WEBSITE: <http://www.nawcc21.com>

NOVEMBER MEETING: The meeting was called to order with the first item of business to welcome Seth Thomas Buxton. Yes, his first and middle name is Seth Thomas. Welcome, Seth.

Mike Korn presented his ideas going forward with an emphasis on generating more attendance and membership to the Chapter. His PowerPoint presentation suggested expanding the topics and encouraging members to bring show and tell items, something that we are good at doing now, but the message is to broaden the boundaries. Novelty watches, often reflecting a political campaign or media event, are enjoyable and welcome. As a Chapter, Mike suggests we begin creating mentoring opportunities for members listing volunteers and identifying interested students. The Chapter also provides community service like when we adjusted the Teller House pioneer clock in Central City and the annual setting of the Seth Thomas tower clocks at East and South High Schools, an event picked up by the local NBC affiliate last month. Tim Orr recalls the Tennessee Chapter he belonged to sending out post cards and the publication of a newsletter used to further attendance and membership. Following discussion those present were eager to have a committee representing these ideas report back in January.

The next item of business was led by Jack Wood who announced that the Boulder Colorado Chapter 160 invites Chapter 21 to its monthly lunch meeting. Jack and Tim Schultz will be distributing more information. Plan for noon-2 p.m. Wednesday, Jan. 10 in Golden.

Show and tell was captured by Dave Cooper, Terry Jones, and Jack Wood. Thanks to each of these presenters for sharing their interesting clocks and timepieces.



Dave Longenecker presented to Chapter 21 on his Seth Thomas Sonora clock.

Librarian Paul Wegener critiqued the book *Clocks and Watches* by Colin A. Ronan. It is a short book, but an interesting read. The book begins with man's early needs in relation to time, to the present. It described the evolution of timekeeping devices and advances that have taken place in recent years.

PRESENTATION: Dave Longenecker shared the Seth Thomas Sonora clock. Seth Thomas Clock Co. was established in the early 19th century, and they produced a wide range of clocks, including the Sonora with the 89A movement accompanied by strike bell mechanisms in some versions and chime rods in others. The company went through several changes in ownership and experienced periods of success and decline, like many clock companies. —David Gies



Creole Chapter 43's end of year social.

LOUISIANA

43. CREOLE

LOCATION: North Kenner Public Library, 630 West Esplanade Ave., Kenner, LA 70065

WHEN: 9–11:30 a.m. the second Saturday of odd-numbered months

MEMBERSHIP INFORMATION: Dave Bertinot

EMAIL: dave@bertinot.com

WEBSITE: chapter43.nawcc.org

NOVEMBER MEETING: Steve Barnes called the meeting to order. Our show and tell this month was crystal regulators. Steve gave a brief description of the clocks having four beveled glass sides, a mercury pendulum encased in a glass vial or a look-alike mercury pendulum. The styles of the cases included onyx, porcelain, and ornate white metal with brass frames. The members brought many varieties of their crystal regulators, giving descriptions of the movements, cases, and origins of their clocks.

Steve Barnes talked about having a Regional in the old location in Metairie, time and date to follow. Bob Taggart made a motion to postpone voting on the officers. Nicole talked about our new Facebook account for Creole Chapter 43. Check us out and leave a comment! Steve

has a new clock restoration project for us, a Mobier clock at the historic Destrahan Plantation. Our Christmas party will be at Gordan and Rickey Nutik's home this year.

—Terry Downs

MAINE

89. MAINE

LOCATION: Brunswick United Masonic Lodge 8, 65 Baribeau Drive, Brunswick, ME 04011

WHEN: 11 a.m. the third Saturday of odd-numbered months

MEMBERSHIP INFORMATION: Mike Brown

EMAIL: nawcc89@gmail.com

WEBSITE: <https://new.nawcc.org/index.php/chapter89-maine>

NOVEMBER MEETING: A gathering of 32 members, plus one new member, George Orestis, and one guest, Jeremy Briggs, enjoyed a lunch together at the Brunswick Mason's Hall.

Lunch was followed by a memorial and moment of silence for Gabe Gaboury, a longtime and well-known clocksmith and member of Chapter 89 who recently passed away.

SHOW AND TELL: Harry Hepburn opened Show and Tell with a watch fob he recently discovered. The fob is made from 18th-century watch case parts. Harry held the floor to present a plaque to Jim Bryant for his aid in restoring a Seth Thomas street clock in Portland. Harry also presented the Cal Morgan Award to Tim Martel in recognition of his many years of dedicated service to Chapter 89. Mark Van Lunen followed, presenting an Edwin O. Shorey ogee-style clock built in Blue Hill, ME in 1841. The 30-hour Kirks movement has a cast iron back plate and brass front plate.

Paul Fournier spoke next, leading a discussion of Chapter 89's expected participation in the New England Regional, scheduled for April 23-25 in Concord, NH. Paul also reminded the group that his next workshop will be held in his Scarborough shop in February. Paul is leading the workshop group through the overhaul of an 18th-century Dutch tall clock movement. The February session will cover polishing pivots.

CHAPTER HIGHLIGHTS



Jim Bryant and Tim Martel enjoy recognition for their contributions to Chapter 89.

NEW OFFICERS: A slate of officers was nominated and approved. They include Greg Saunders, president; Mark Beever, first vice president; Charles Thurlow, second vice president; Tim von Reyn, treasurer; Tony Accardi, assistant treasurer; Mike Brown, secretary; and Mark Van Lunen, assistant secretary.

Once the annual meeting was complete, the group moved to a larger room and conducted a lively auction of clocks, clock parts, and tools. Some members divested themselves of extra items, while others added to their collections — and a few members did both! —*Mike Brown*

MARYLAND

11. MARYLAND

LOCATION: Pickersgill Retirement Community, 615 Chestnut Ave., Towson, MD 21204

WHEN: 9 a.m. mart, 10 a.m. meeting and program the second Sunday of even-numbered months

MEMBERSHIP INFORMATION: William Miller

EMAIL: bill1815clocks@gmail.com

WEBSITE: <https://new.nawcc.org/index.php/chapter-11-maryland>

DECEMBER MEETING: We met in the Willard Room at the Pickersgill Retirement Community. Since the meeting

was held in the assisted living area, we were required to wear masks except in the meeting room. Thirteen members and guests enjoyed Dunkin's coffee and donuts.

President Frank Blahut called the meeting to order, and after a short business meeting our annual "Most Interesting Clock" program began.

Rob Hendrickson presented a small S.B. Terry 8-day T/S iron-front wall regular with a reverse painted glass in the door, which was in excellent condition.

Tom Mostyn's entry was a table clock with four ebonized barley twist columns. There was no maker's name, but it was thought to be either Austrian or German. Tom also showed a miniature version of the clock that he made, but only with two barley twist columns.

Ed Butler showed a Japanese time and strike naval clock. All of the identifying marks were in Japanese, so its maker was unknown.

Jim Manning showed a small, approximately 1' tall musical bracket clock signed "Wm. Watkins, London". The movement was an early verge escapement with seven bells playing four tunes, the selected tune playing on the hour. The ebonized case had a silvered dial, feet and handle.

Bill Miller had two unusual table or shelf secondary clocks, both with one minute advance of the hands. Most secondary clocks are wall-mounted round-gallery clocks. One of the clocks was a small replica of an early English lantern clock, about 6" tall, complete with opening side and rear doors, mounted on a mahogany base. The bell on the top was non-functioning. The second clock, 12" tall, was in a solid oak Roycroft of Arts and Craft-style case. The dial was marked "Magneta, Electric, London."

Frank Goad had several Hamilton railroad-grade pocket watches with Webb C. Ball on the dial. They were also unusual in that they all had logos for various railroad brotherhoods on the dial, such as "Brotherhood of Railroad Conductors" or "Brotherhood of Locomotive Engineers."

Bill Bonta's entry was an American Clock Co. battery-operated crystal regulator. The clock was missing the

pendulum regulating unit, which was unique to the clock. The unit allowed the clock to be regulated without disturbing the motion of the pendulum. Bill made the missing unit, and had a PowerPoint showing the unit and the restored clock in operation.

Bill's entry was overwhelmingly voted the Most Interesting Clock. —*Bill Miller*

MASSACHUSETTS

8. NEW ENGLAND

LOCATION: Varies

WHEN: February, April (New England Regional), May (Annual Willard House & Museum Workshop), August, and October.

MEMBERSHIP INFORMATION: Steve Chatlas, 860-828-1743

EMAIL: sgchatlas@aol.com

WEBSITE: <https://nawcc8.org>

There were no Chapter 8 meetings in November or December, but the Chapter's planning committee continued work on putting together the 2024 NAWCC New England Regional to be held on April 26-27.

Lead host is Chapter 8 with co-hosts Greater Massachusetts Chapter 87, Connecticut Chapter 148, Granite State Timekeepers Chapter 189, Green Mountain Timekeepers Society Chapter 109 and State of Marine Watch & Clock Collectors Chapter 89. Details as well as registration forms can be found at newenglandregional.org. —*Gary Ewing*

MICHIGAN

101. WESTERN MICHIGAN

LOCATION: St. Paul's Anglican Catholic Church, 2560 Lake Michigan Dr. NW, Grand Rapids, MI 49504

WHEN: First Saturday of even-numbered months

MEMBERSHIP INFORMATION: Richard Weiderman

EMAIL: pjkurta@gmail.com

WEBSITE: <https://www.westmichigan101.com>

DECEMBER MEETING: Twenty-two members and guests of Chapter 101 gathered on December 2. The mart

was sparse but serviceable and about equally divided between clocks and watches. There were about a dozen Mastercraft electric clocks on offer, all in working order. Examples ranged from table models to wall models and even included two that looked like electric Atmos clocks. All the watches in December's mart fit in pockets. Each of the seventeen on offer were beautifully restored examples made for railway service. There were Hamiltons, Elgins, and Walthams aplenty. One particularly fine example was a Father Time in a polished, gold hunter's case with a Roman-numeral dial.

Pocket watches were also the subject of December's watch contest. Previously the Chapter has studied 18- and 16-size pocket watches. This time we looked at 12-size watches. Ron Heidrich took first place for his well-researched Elgin while Rich Weiderman placed second for his 12-size Elgin in a nickel-steel case. Clocks in wooden cases competed this holiday season. Pat Loftus's clepsydra, a British reproduction, swept the field. But it left enough room for John Loomis's two Seth Thomas mantel clocks to create a stir of their own.

The membership extends its gratitude to Elinore Walsh and Jane Weiderman for their work putting together the Chapter's annual Christmas potluck. Jane, by the way, won this year's spouse's door prize. The member's prize went home with Jerry Gorham.

Before the Chapter's February meeting, Alan Siegel, our beloved "Dr. Al," will turn 90.

Those wishing to know more about Chapter 101 and its happenings are encouraged to check out our website or to contact President Jon Start at 269-998-1665.

—*Richard Weiderman*

MINNESOTA

20. O.T. LANG

LOCATION: Various

WHEN: Third Saturday of odd-numbered months

MEMBERSHIP INFORMATION: Steve Scidmore

EMAIL: StSc112358@gmail.com

WEBSITE: <https://Minnesotawatches.com/otlang>

CHAPTER HIGHLIGHTS

NOVEMBER MEETING: Twenty-two members and guests attended the November meeting at the Mediterranean Cruise restaurant in Burnsville. The meeting was presided over by Chapter Vice President Richard Zielike. Steve Scidmore served as the host.

PROGRAM: Nate Otto spoke on the American Fotoplayer. Nate operates a business in Anoka called Rum River Restoration, where he restores player pianos. He takes on the restoration of about four of these per year and has a waiting list. Most of the people who restore player pianos are based on the East Coast so he is one of the few resources for restoration in the Midwest. He believes he is the only full-time restorer in the state and attracts clients from a few states away. Nate got his start after his grandparents' player piano gave up the ghost and he attempted to fix it. Nate researched player pianos and eventually contacted Don Barton of Barton Player Piano in Minneapolis. Nate ended up working for Mr. Barton for few years and when Mr. Barton retired, Nate set up his own shop.

However, what Nate talked about in his presentation was something quite a bit more sophisticated, the America Fotoplayer. A Fotoplayer includes a player piano but it does much more than that as various models could incorporate organs, percussion, and a wide variety of sound effects. Fotoplayers were used in theaters to accompany silent films. Although these devices were expensive, the idea was to replace the band or small orchestra that provided the music accompaniment for a film. The name Fotoplayer derives from the word *photoplay*, an early term for a motion picture. These devices were produced in the 1910s and 1920s and were made obsolete when sound was introduced to film. Fotoplayers used two piano rolls so that you could switch between them. Fotoplayer music tended to be theme music meant to accompany a film rather than typical piano player music. As a consequence, few Fotoplayer rolls survive.

Nate discussed his acquisition of a Style 15 which had been significantly modified by a previous owner. The Fotoplayer had been unearthed during renovations of a theater where it sat in what would have been an orchestra pit but this pit was just boarded over with the Fotoplayer left in place. The machine was listed as "fully restored"



Nate Otto with some Fotoplayer components at Chapter 20's November meeting.

when Nate acquired it, but it wasn't! Some cabinet parts were missing and Nate was able to source some parts from Canada. He also had to have some parts remade and then finished them to color match the cabinet. The previous "restorer" had used hot glue on pieces, including gluing the bellows with it. This all had to be removed and redone. Brass parts had been worn down with hard use and as these parts are proprietary, Nate had to source parts from a donor machine. Mind you, this is believed to be the only Style 15 left in existence. Nate estimates that he spent somewhere between 2,000 and 4,000 hours over a period of three years to get the Fotoplayer in working condition. Near the end of the presentation, Nate showed a video where he is operating his Fotoplayer to accompany a *Felix the Cat* video. You really got a sense of what it must have been like to attend a silent film screening back in the day. For videos on his work, Nate has a YouTube channel called Outside the Vacuum with Nate Otto.

The business meeting was conducted by Chapter President Gary Anderson.

This meeting was held in memory of longtime member and Atmos clock expert, Greg Smith, who passed away in October. In recent years Greg coordinated our Annual Projects Restoration meeting. —Steve Scidmore

MISSOURI

36. HEART OF AMERICA

LOCATION: Trailside Center, 9901 Holmes Rd., Kansas City, MO 64131

WHEN: 1 p.m. the first Sunday of even-numbered months

MEMBERSHIP INFORMATION: Mark Parkins, 913-208-5369

EMAIL: parkins66209@yahoo.com

WEBSITE: <https://new.nawcc.org/index.php/chapter-36-heart-of-america>

DECEMBER MEETING: Heart of America Chapter 36 members held their December meeting at their new venue at the Trailside Center just a few blocks from the previous site. The location is an interpretive site for the National Parks Service and is operated by the New Santa Fe Historical Society. The community meeting room is provided with up-to-date audio visual equipment and contains a small museum with exhibits about the Santa Fe and Oregon Trails, the Fitzhugh-Watts Mill, the New Santa Fe Village, and the Battle of Westport. Thanks to member Bill Rankin for suggesting this great location.

President Mark Parkins opened the December meeting by noting the attendance of 20 members and three guests. The minutes of the October 8 meeting were approved after a motion by Harry Firth and a second by Ed Reupke. Mark's first item of business was the announcement of a signed contract to hold the 2024 River Cities Regional on April 5-6 at the City Center Fitness building in Lenexa. The site has a gymnasium to hold the mart and room for the educational program and refreshments. A hotel for attendees has not yet been determined, but several good hotels near recent regionals are nearby. Members can sign up for committees at our next meeting on February 4.

As the December meeting marked the end of officer terms, new elections were held for the years 2024 and 2025. Current officers all agreed to continue serving the Chapter in their current capacities. These positions are President Mark Parkins, Second Vice President Chris Malik, Treasurer Nancy Spieker, and Secretary Thaine Damman. Mark placed these names in a motion and members approved the new officers by unanimous voice vote. The first vice president position remains unfilled.

PROGRAM: December's meeting traditionally includes a holiday gift exchange. In addition to a wrapped gift members brought special seasonal treats, so snacking and unwrapping became our entertainment instead of a program. After a very brief show and tell of a unique calendar clock by Harry Shultz, gifts to all members were allotted by random drawing instead of by our usual white elephant exchange. Drawing for gifts this year also included extra door prizes such as gift certificates from Time Savers. Only a few small clocks and one watch were unwrapped, but most recipients were pleased to take home candy and cookies. A larger than usual 50/50 drawing of \$43 went to Greg and Trudy Moffitt. Members spent the remaining meeting time mingling, talking horology, and enjoying a generous selection of cookies, pastries, and desserts. —*Thaine Damman*

NEW HAMPSHIRE

189. GRANITE STATE TIMEKEEPERS

LOCATION: First Free Will Baptist Church. NH Route 114, North Sutton, NH 03260

WHEN: Six meetings on the third Saturday between September and May

MEMBERSHIP INFORMATION: Christopher Way

EMAIL: c_way@mcttelecom.com

NOVEMBER MEETING: The November meeting of Chapter 189 was held at the Schmitt Horan & Co. auction site in Candia. There were 30 Chapter members and guests in attendance. Many different clocks, watches, and tools were displayed in the mart area.

After lunch, president Ted McCanhan opened the meeting by welcoming two new members. Ted also announced that the Chapter had made a donation to the Free Will Baptist Church's (our meeting location) Operation Christmas Child collection for children's gift baskets to be sent overseas. The upcoming election was discussed with available positions being vice president, treasurer, and director. Chris Carey talked about the upcoming New England Regional Meeting on April 26 in Concord. Chris listed several of the events that will take place and emphasized the need for volunteers.

TOOL TALK: Bill Fletcher discussed how he uses his bench-mounted drill press as a general press using

CHAPTER HIGHLIGHTS



Denis Carignan during his presentation to Chapter 189.

adapters. Using the drill press gives him the precision he requires. He showed several tools he uses (small vice, anvils, dowel pins, etc.) in conjunction with the drill press. Bill also talked about using the Sensitive Drilling Tool from Sherline. It is one of his favorite tools.

Jon Weber showed and described the use of a Jacot tool, used primarily for polishing and burnishing watch pivots. It can also be used for reducing the size of a pivot.

PRESENTATION: Denis Carignan, owner of the Carignan Watch Co. in Belmont, is an extremely talented horologist. His presentation was a slide program documenting the design and making of a complicated watch spring using CAD/CAM and CNC. Denis talked about the things he used: a camera to attain a colimated image and AutoDesk Fusion 360 CAD/CAM software. He also included measuring tools like calipers and micrometers, a CNC machine capable of accurately machining steel, heat treating equipment, and chemicals and files/stones and abrasives for finishing. He then talked more specifically about each.

Denis stated that any digital camera can work. A simple cell phone mounted on a tripod works fairly well if it has an indicator that shows when it is level. He also uses a

purpose-built microscope. Denis uses a modified TAIG CNC mill with a stock BT30 spindle, 1200 watt motor with a MASSO control. He described it as "sufficient." One could use an inexpensive CNC router/mill but the parts produced would require a lot more hand-finishing. Denis uses high-quality carbide tooling wherever possible.

Denis uses a simple kiln with a PID controller. A torch will also work. Boric acid mixed with denatured alcohol is used as an anti-scale. He also uses O1 tool steel to make tools and parts. It is oil quenched with low distortion and easy to harden when coated with boric acid, heated to cherry red, plunged into oil, cleaned, polished and then tempered by heating slowly while watching color change.

Denis is very willing to share his vast knowledge and experience. He offers numerous private or group lessons or workshops either in person or via Zoom. For more information, Denis Carignan can be contacted at www.cwrnh.com. Chapter 189 wishes to thank Denis for his excellent presentation. The virtual tour of his shop was fascinating. We are honored to have him as a member and working in New Hampshire.

Several Chapter members took some time after the meeting to visit the Schmitt Horan & Co. work and storage facility. We want to thank Dan and Celeste Horan for their generosity in sharing their facilities with Chapter 89. —*Joe Cavanaugh and Steve Sanborn*

NEW JERSEY

142. CENTRAL JERSEY

WHEN: Check website

LOCATION: Church of the Nativity, 180 Ridge Rd, Fair Haven, NJ 07704

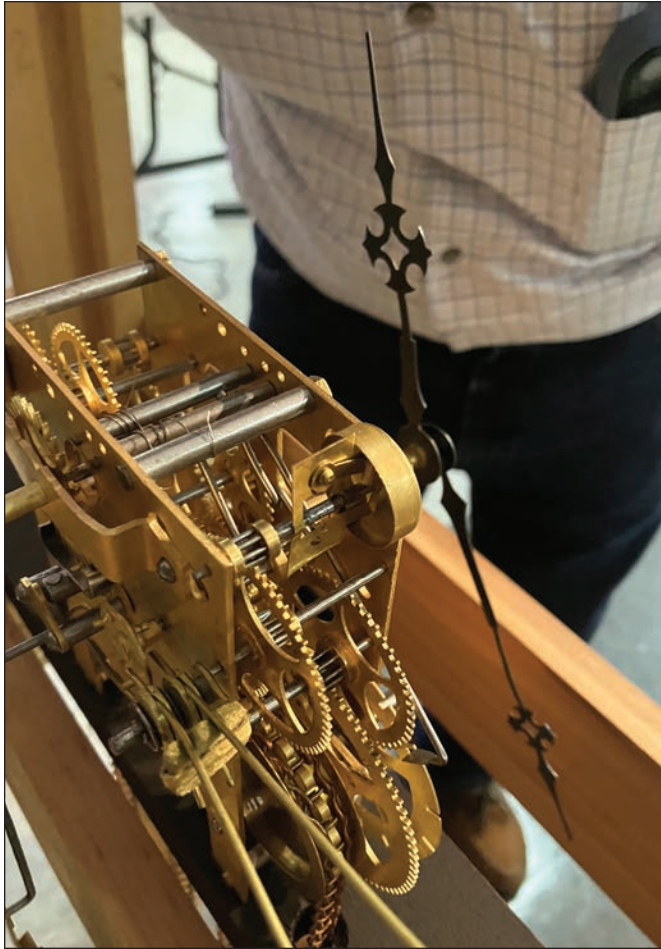
MEMBERSHIP INFORMATION: Rich Cross

EMAIL: richard07044@gmail.com

WEBSITE: <https://new.nawcc.org/index.php/chapter-142-central-new-jersey>

NOVEMBER MEETING: About 20 members attended.

The mart was slow due to the holidays. Member Bill Daniels presented on Gilbert clocks with the Owen striking system and how he overhauled the clock and repaired the fly mechanism. A couple of weeks earlier a



Bill Daniels presented to Chapter 142 on Gilbert clocks with the Owen striking system and how he overhauled this particular clock and repaired the fly mechanism.

group went to Morven in Princeton and got a tour with Steve Petrucelli of New Jersey tall case clocks. —*Rich Cross*

NEW YORK

84. MID-HUDSON

LOCATION: Freedom Plains Presbyterian Church, 1168 Route 55, Lagrangeville, NY 12540

WHEN: Normally, the second Saturday of even-numbered months

MEMBERSHIP INFORMATION: Mark Nathanson, 845-592-0065

EMAIL: tictockmark@hotmail.com

WEBSITE: <https://new.nawcc.org/index.php/chapter-84-mid-hudson-chapter-84>

DECEMBER MEETING: The Chapter's annual Christmas party and meeting was attended by more than 36 members, guests, and a few spouses. A mart featured several clocks, watches, and various horological tools for sale or trade.

A formal business meeting was held and included the re-election of existing board members and was followed by the treasurer's report of satisfactory solvency.

A show and tell session featured John Greeney's heavy iron mantel clock under restoration. Dave Eubank showed his extremely heavy and large iron wall clock, and Joe Magnarella told of his discovery of a beautiful gold-filled pocket watch at a local refuse transfer station.

Past President Jim Holmgren encouraged everyone to consider attending the upcoming beginners and advanced clock repair classes, commencing locally, in January. A substantial luncheon followed with sandwiches, salads, desserts, and liquid refreshments. —*Mike Graham*

NORTH CAROLINA

17. CAROLINA

LOCATION: Lexington Masonic Lodge, 468 Central Ave., Lexington, NC 27292

WHEN: Mart 9:30 a.m., classes 10:15 March 16, May 11, July 13, September 14, November 9

MEMBERSHIP INFORMATION: Terry Hall

EMAIL: tehall2018@gmail.com

WEBSITE: <https://new.nawcc.org/index.php/chapter-17-north-carolina>

NOVEMBER MEETING: Tom Zelke opened the meeting welcoming the 24 in attendance. Chapter 17 welcomed new members Mark Mayerchak and Joseph and Carol Sasek. An active mart was held with plenty of items for sale/trade, a few items for silent auction, and a free table. We experimented again with free meeting admission for those setting up items for sale in the mart. David Pendley conducted a clock class concentrating on stopworks. Mark Mayerchak won the door prize on his first time out! Dave Dawson cashed in on the 50/50 drawing.

Chapter 17 elections were held with David Pendley

CHAPTER HIGHLIGHTS



Chapter 17's Calvin Coble gave a talk on reduced-scale clocks.

...serving as new president, Don Whitaker as vice president, Terry Hall as second vice president/secretary, and Diane Burghardt as treasurer.

PROGRAM: Our own Calvin Coble gave a talk on reduced scale clocks. Accompanying the talk was an extensive display of approximate ¼- and ½-scale clocks of many varieties. Member Paul Stamey also shared examples from his collection. Calvin's talk taught us about the makers of these reduced-scale cases: Foster Campos was very prolific and Calvin had many examples of his banjo cases. Wayne Cline from Kentucky was another maker represented, along with examples from Tim Davis of Star, NC. Some of these were mantel, shelf, and kitchen-style cases. These reduced-scale cases were provided in the past as kits. Calvin explained how he used mainly Waltham 8-day movements to provide the works for these clocks. Calvin also explained that some examples utilized a modified barrel so that the Waltham 8-day could be wound from the dial side of the movement. At one time a facility Calvin was involved with machined these modified barrel arbors to retrofit the existing barrels.

Tom closed the meeting with wishes for a joyful Christmas season for everyone. —*Terry Hall*

OHIO

23. BUCKEYE

LOCATION: Moraine Civic Center, 3050 Kreitzer Rd., Moraine, OH 45439

WHEN: Noon–4 p.m. February 3, April 6, June 1, August 3, October 5, December 7

MEMBERSHIP INFORMATION: Peggy Goodwin

EMAIL: pjgoodwin@fuse.net

WEBSITE: <https://new.nawcc.org/index.php/chapter-23-buckeye-23>

DECEMBER MEETING: The Buckeye Chapter welcomed 45 members and their guests to the Moraine Civic Center for our annual holiday mart and potluck lunch. We all enjoyed an afternoon of buy-sell-trade activity during the mart, a great educational session, sampling those favorite holiday dishes, and engaging with fellow horology enthusiasts. Many thanks to Brenda Baker, Debbie Griffen, and Carol Yegerlehner for expertly arranging that wide array of delicious taste treats for all to enjoy.

PROGRAM: Jordan Ficklin, a partner in the Cincinnati Watch Co. and the owner of Cincinnati Watch Repair, gave a fascinating look into "The World of Micro-Brand Watches." The presentation covered basic definitions of terms used in that industry and a view of what's involved in operating a business within that genre of watchmaking. As the name implies, micro-brand is smaller-scale production with various levels of in-house and outsourced operations. This can range from design, development, assembly, and marketing functions occurring in-house while manufacturing of components is outsourced; some micro-brands may outsource the assembly as well. Cincinnati Watch does their own assembly of components and the timing of mechanical watches.

Design ideas for Cincinnati Watches are purposeful reflections of the community, with a portion of the sales proceeds going to charities that inspired those designs. For example, the first watch produced was inspired by the clock on the iconic exterior of the Cincinnati Museum Center building. Another was designed around a cockpit instrument inside a Curtiss P-40M World War II fighter at



Jordan Ficklin provides a birds-eye view of micro-brand watchmaking to the Buckeye Chapter 23 membership.

the Cincinnati Warbirds Museum, while another pays tribute to the building where the Gruen Watch Co. was housed.

The Cincinnati Watch Co. is centered on three key principles: supporting local charities, designs reflecting the community, and producing a top-quality product. Many thanks to Jordan for providing this most interesting overview of his company's operations.

It's never too early to start planning your trip to Wilmington, OH for the ever-popular Southern Ohio Regional. The featured speaker will be Micah Tasker presenting "On the Road with the Vintage Watch Man." The SOR runs April 11–13 and we hope to see you there!

UPCOMING MEETINGS:

- April 6 — Our regularly scheduled Chapter meeting at the Moraine Civic Center.
- April 11-13 — The Southern Ohio Regional in Wilmington, OH. It's always a fun, festive event and one you don't want to miss!
- May 11 — Our mart-only satellite Chapter meeting in Piqua, OH. Check the April newsletter for details.

Anytime you're traveling in the Dayton/Cincinnati area on a weekend that our Chapter meets, by all means, please come join us. All NAWCC members are welcome at our meetings, and your presence certainly contributes to the fun. —Peggy Goodwin

PENNSYLVANIA

1. PHILADELPHIA

LOCATION: Holiday Inn, 1750 Sumneytown Pike, Lansdale, PA 19443

WHEN: See website

MEMBERSHIP INFORMATION: Jeff Fox

EMAIL: jeffrey.w.fox@gmail.com

WEBSITE: <http://new.nawcc.org/index.php/chapter-1-philadelphia>

SEPTEMBER MEETING: On August 9, the One-Day Class met and was anxious to try out its new venue, the Horsham Community Library. It was a pleasant surprise; the library staff were welcoming and helpful throughout the day. The class itself, repairing an 8-day American kitchen clock Part 1, had nine participants. We concentrated on polishing pivots and bushing the clock movements. At the September 23 meeting, we had 73 members present and sold 35 tables. The buying and selling was brisk throughout the mart. The One-Day Class had seven participants and went well. The cost of the new venue is so reasonable that we decided to make the classes free. The costs of the venue and the pizza and soda lunch will be assumed by the Chapter.

The topic was repairing an 8-day American kitchen clock Part 2. We were pleased that several interested members of the public stopped by to see what we were doing. Ricardo Baez, a student at the Patek Philippe school, gave a very informative talk via Zoom on the current state of the watch repair industry. His perspective as a student just entering the field was refreshing, and some of his suggestions for improving how watch repairing is taught were stimulating and informative. The Best in Show Contest, Clock category, was won by Dan Schroeder for a cuckoo clock he had modified for his brother. The Other category was won by Dave Gorrell, who displayed and explained a device for cutting the teeth on wooden clock gears.

CHAPTER HIGHLIGHTS

DECEMBER MEETING: The December 3 meeting was held at the Holiday Inn in Lansdale where members met and 37 tables were sold. Steve Petrucelli gave a truly memorable presentation called "Striking Beauty: New Jersey Tall Case Clocks 1730-1830." He was instrumental in putting together this once-in-a-lifetime display of magnificent New Jersey tall case clocks. This display featured over 50 examples of the art and craft of that state's clockmaking skills. This display was compiled from private as well as public collections and is, through February 18, open for viewing at the Morven Museum and Garden in Princeton. However, Steve has produced a very informative YouTube presentation where you can see this collection and appreciate the beauty and craftsmanship of those early clockmakers. The workshop was presented by Dave Gorrell, who demonstrated how to make trim parts for clock cases using the cabinet scraper. He displayed a machine he adapted for cutting the profile blades used to produce the wooden trim pieces. The Best in Show contest was won by Bruce Quinn, who entered a small Dutch travel clock from the early 1700s.

The Mid-Eastern Regional was held on November 3–4 at the York Expo Center. There were 450 people in attendance, and 275 tables were sold. The exhibit "Miniature Clocks Produced by Andrew Marlowe" consisting of a collection of his miniature clocks made in York, was provided by Jim Zimmerman. Jim also served as the guest speaker, giving a comprehensive talk on "Andrew Marlowe: The Man and His Clocks ... Time in Miniature." —*Dave Gorell*

37. ALLEGHENY

LOCATION: Brown's Country Kitchen, 1149 W. Portersville Rd., Portersville, PA 16051

WHEN: First Sunday of even-numbered months

MEMBERSHIP INFORMATION: John Scott

EMAIL: alleghenyclockchapter37@gmail.com

DECEMBER MEETING: Nineteen members, guests, and spouses attended the December 3 Allegheny Chapter 37 meeting at Bissett Chevrolet in Mercer. Ben Bissett and his wife, Margaret, hosted the meeting. Members greeted each other in a Christmas atmosphere over cookies and refreshments. This was a social event so there was no entrance fee charged, and no clock mart or silent auction. Seventeen members paid their dues for 2024.

The secretary's and treasurer's reports were read and approved. Every other month Marlo Davis from National sends officers a spreadsheet of paid and lapsed NAWCC memberships in our area. The Chapter sent an email to correct for members who passed away and were marked as lapsed. Members who have passed on are Joe Abrams, Dorothy Gold, Gary Quinin, and Mahmoud Rahim.

A discussion on low attendance led to a motion to decrease the number of meetings from six to four times a year with flexible dates. The next meeting will be February 4 at Tepper Hall in Pittsburgh. Raymond Mailki made arrangements and will present the program. The Chapter members will decide at the February meeting when and where the four meetings will take place.

Raymond Mailki sold \$239 of library books. The remainder of the books will be donated to the national headquarters.

There has been a lapse in winders that tend to the tower clock. A new schedule of clock winders is being drawn up for 2024. Volunteers are being accepted. The clock winders will be trained and follow a schedule from a link in Google. Contact LB at beck1213@verizon.net or SS at stan.stash@icloud.com to volunteer to wind. It was suggested that some museum staff could be trained to assist.

Discussion continued on the future of the Chapter. That led to concern about passing on ownership of the tower clock to the Children's Museum. PB made a motion to write a letter to the Children's Museum and to ask JB if he would intercede for the Chapter and talk with the directors to see if the museum might be interested in taking ownership of the tower clock. According to the Chapter's previous minutes, there needs to be an executive committee of officers to decide how to transfer ownership of the clock. The committee would write up a letter of intent with a list of their concerns for care of the tower clock.

PROGRAM: Tom Huber presented an informative program on watch cases. He talked about watch case development. The watch sizes went from larger to smaller. He showed gentlemen's watches (12) and ladies' watches (0-3). He used a watch gauge to fit a movement



Ken De Lucca presented "Time Is a Talent" at Chapter 158's November meeting.

into a case. He talked about the dangers of over-polishing a watch. Always use a jeweler's cloth, never a machine, to polish a watch case. —*John Scott*

158. KEYSTONE

LOCATION: Hoss's Steak and Sea House, 61 Gettysburg Pike, Mechanicsburg, PA 17055
WHEN: Third Wednesday of odd-numbered months
MEMBERSHIP INFORMATION: Karen Laning, 480-544-5501
EMAIL: karenlaning5552@gmail.com
WEBSITE: <https://new.nawcc.org/index.php/chapter-158-keystone>

NOVEMBER MEETING: Chapter 158 met at Hoss's on the evening of November 15 with 27 in attendance. President Wayne Laning could not attend so Vice President Tom Deprez took over.

An election was held for treasurer and Lee Davis was chosen by unanimous vote. Lee also thanked several Chapter members for helping with the Mid-Eastern Regional sponsored by Philadelphia Chapter 1 on Nov. 3-4 at the York Expo Center.

PRESENTATION: Our speaker for the evening was Director of Education at the NAWCC School of Horology Ken De Lucca. Ken's talk was titled "Time Is a Talent," the story of two tavern clocks. The talk focused on two clocks that Ken became familiar with and whose history he learned many years ago. Several good illustrations of these two clocks and some background information provided insights into the clocks' origins and what kind of establishments they may have originally hung in.

—*Lee Davis*

193. SUSQUEHANNA

LOCATION: Trinity Episcopal Church, 844 W. 4th St., Williamsport, PA 17701
WHEN: Third Wednesday of even-numbered months
MEMBERSHIP INFORMATION: Allan Harvey, 570-690-9635
EMAIL: harv5@epix.net

DECEMBER MEETING: Eighteen members and guests enjoyed a catered meal. President Allan Harvey introduced the guests and conducted the business meeting.

PRESENTATION: The topic for the evening's presentation was pivot polishing. Member Ed Warble provided a very informative talk on watch pivot polishing using a jeweler's lathe and assorted tools. —*Allan Harvey*

SOUTH CAROLINA

144. PALMETTO STATE

LOCATION: Lizard's Thicket, 7938 Garners Ferry Rd., Columbia, SC 29209
WHEN: 9:30 a.m., the first Saturday of even-numbered months
MEMBERSHIP INFORMATION: William McCoy, Dave Graley, Helga Crandall
EMAIL: info@lowcountryhorology.com, dlgraley@aol.com, thcrandall@hargray.com

DECEMBER MEETING: Eighteen members and spouses were in attendance, including one new member. A diverse and active mart preceded our meeting, featuring watches, clocks, books, and tools.

CHAPTER HIGHLIGHTS



Chapter President Bill McCoy presented to Chapter 144 on compensated pendulums, an example of which he's holding here.

For show and tell, Dave Graley brought a very small French movement recased in a scratch built case that he made himself. This was Dave's third attempt at small case building, and there will be more to follow.

After our formal business meeting, Chapter President Bill McCoy presented a discussion on the theory behind compensated pendulums, provided details on various types, and showed how each approach strives to maintain the center of gravity and corresponding accuracy of the movement. As an adjunct, with assistance from the audience, Bill demonstrated isochronism and cycloidal pendulum motion. Note that additional informative programs are scheduled for future meetings.

At the conclusion of the program, we sat down to our customary lunch, provided by the Chapter for members, spouses, and guests. —*Dave Graley*

TEXAS

15. SOUTHWESTERN

LOCATION: Pflugerville Rec Center, 15822 Foothill Farms Loop, Pflugerville, TX 78660

WHEN: Third Saturday of each month except August and December

MEMBERSHIP INFORMATION: Pat Holloway

EMAIL: patricia.w.holloway@gmail.com

OCTOBER MEETING: Ciro Ramirez gave a program called "Polar Sundials." During the presentation, Ciro described the design, characteristics, and complications of polar sundials. He included images of various examples, including one that he recently completed and installed at his home. Most of the attendees were familiar with the more commonly seen types of solar sundials from Ciro's earlier presentation, but no one was familiar with polar dials. When using, or erecting, a solar sundial the location's latitude and longitude must be known, as well as true north for the northern hemisphere or south for the southern hemisphere. However, for polar dials only east and west must be known, and the same dial can be used regardless of latitude.

The finished polar sundial looks somewhat like a tennis court with a solid piece across the center of the rectangle rather than a net. The solid piece across the center marks noon. Starting from the center, there are lines inscribed across the rectangle. As the lines move away from the center, the distance between lines increases. In other words, the longer it is before or after noon, the longer the shadow.

Without getting into all of the math needed to calculate the distances between lines, Ciro walked us through how he came up with the design for his dial, including the imagery and motto. If anyone is interested in learning more about the various types of sundials, you can visit sundials.org, the website of the North American Sundial Society. The website covers a wide variety of topics, including a section for teachers, videos, instructions for making dials, and a sundial registry, complete with pictures and descriptions of known sundials.

NOVEMBER MEETING: In November, Ben Courtney gave an eye-opening presentation called "A Brief History of

the Atkins Clock Co.” Most of the attendees were familiar with Atkins clocks, but few were aware of the evolution of the company, the other products that members of the Atkins family made, or all the other clockmakers with whom they were in business along the way. Ben’s brief history provided a concise and interesting high-level look into Atkins’ efforts.

During the follow-up discussion, several books and videos were recommended for additional information, including *The Clocks of Irenus Atkins* by Phil Gregory and Richard King; the reprint of *Illustrated Catalogue of Clocks Manufactured by the Atkins Clock Co., Bristol, Conn* that includes a history of the company by Chris Bailey along with the catalog; and four videos of presentations by Phil Gregory including a walkthrough of the NAWCC Atkins exhibit — all found on the NAWCC’s Vimeo channel. Many thanks to Ben for stepping up to provide this presentation for the last meeting of 2023. —*Pat Holloway*

124. LONE STAR

LOCATION: 102 N. MacArthur Blvd., Irving, TX 75061

WHEN: June, August, October and January

MEMBERSHIP INFORMATION: eve.slough@sbcglobal.net

WEBSITE: www.chapter124.org

JANUARY MEETING: The Board of Directors met on January 6 at our classroom facility in Irving, mostly to discuss the 2024 Lone Star Chapter 124 Regional on February 29–March 2. Other agenda items were educational classes, membership, and a donation made by one of our members for teaching instructors. Phil Gregory is one of our longtime members who once taught reversed glass and dial painting. He wants to keep the specialty classes going and made a generous donation to help train new instructors. Other members making donations are Dr. John Hunt and several anonymous members. I tip my hat to our loyal and generous members whose donations help to keep our Chapter moving forward.

Don’t miss the Lone Star Chapter 124 regional February 29–March 2. Our exhibit will take advantage of this being a leap year and will feature calendar clocks.

—*Tim Brownlee*

VIRGINIA

34. OLD DOMINION

LOCATION: Holiday Inn Gateway, 515 Bypass Rd, Williamsburg, VA 23185

WHEN: February 11, April 14, June 9

MEMBERSHIP INFORMATION: Judy Draucker

EMAIL: jtdraucker@gmail.com

WEBSITE: www.nawcc-ch34.com

DECEMBER MEETING: Twenty-two attended the December 10 meeting of the Old Dominion Chapter 34. Our exhibit and mart opened at 10:30 a.m. The mart had a good selection of restored vintage wristwatches. The exhibit table had displays of both clocks and watches, plus examples of watch cases and case trademarks/hallmarks that were discussed during the morning presentation by Ed Fasanella. Other items included an early Optel model CA-1 digital clock (that was not a business success), Rolex/Boucherer spoons, and a very ornately cased Hamilton pocket watch. Our usual procedure is to have each exhibitor get up and tell a story about each item. A ticket is given to each presenter, and the winner receives a free lunch. Greg Hannahs won the drawing for his exhibit of two Hamburg American China clocks and received the free lunch!

The program “Watch Cases and Their Makers” was presented using PowerPoint. Ed gave an overview of the history of watch case makers starting with early case making in Europe and the United States. He discussed the English makers and their hallmarks that allowed the date, maker, assay office, and precious metal content to be determined. English hallmarks of a Dennison-cased pocket watch were shown from the factory of Aaron Dennison, a founder of the American Waltham Watch Co., who moved to England to start his own case company after his “Waltham” company had to declare bankruptcy. (Royal Robbins was the purchaser, who hired and then later fired Dennison.) Then, the talk’s direction turned to the United States and the rise and fall of large case-making factories such as Keystone, Wadsworth, Star, Fahys, Dueber, etc. The US laws that governed gold content-marking, such as “guaranteed for 20 years” and 1/20 12 karat gold-filled, were discussed. Also, fakes and forgeries were highlighted as well as other misnomers

CHAPTER HIGHLIGHTS



Greg Hannahs' exhibit of two Hamburg American clocks at Chapter 34's December meeting.

such as silveroid cases that had no silver at all. Finally, recasing of movements and the proper case for a vintage movement were discussed.

After our buffet lunch, our president, Rick Robinson, presided over the business meeting. He requested that members keep in mind the upcoming election of officers, and emphasized the importance of the VP/Program chair, as programs are the heart of our meetings. Readings of the minutes and the treasurer's report were approved, and a donation of \$200 was also approved to the Willard House. As per our tradition, door prizes were given by drawing of tickets given to all attendees.

The next program was the video *The House of Wonders – 1931 The Elgin Watch Company*. The film was a walk back in time to 1931 when Elgin was the major watch producer of the world. The video showed the workers using the complex factory machinery to produce the wrist and pocket watches of that time. The video, although silent, had captions that explained each process. Following the video, the meeting was adjourned. —*Ed Fasanella*

WASHINGTON

53. INLAND EMPIRE

LOCATION: Varies

WHEN: Varies

MEMBERSHIP INFORMATION: Dennis Armstrong

EMAIL: daa3@msn.com

WEBSITE: <https://new.nawcc.org/index.php/chapter-53-inland-empire>

OCTOBER MEETING: Eight members gathered at the Applebee's in Kennewick October 28. Members enjoyed a DVD by Tom McIntyre on the Waltham's American Watch Co., *40 Years of Excellence*. Plus, Spokane member Dr. Sears did a nice presentation detailing a recent NAWCC seminar on gear cutting that he recently attended.

The meeting featured a very active mart with many items headed home with new owners.

SHOW AND TELL: Moving down through the alphabet to G for the Kennewick meeting saw members showing a Golden Girl French swinging clock, a Gruen ladies Curvex wristwatch, a Gesswein-brand hone stone, a Greenlee voltage detector, a book view of a gravity escapement, and two MIDO gold-capped rings. Our thanks to everyone for sharing. —*Dennis Armstrong*

SPECIAL INTEREST

159. BRITISH HOROLOGY

LOCATION: Varies

WHEN: Regional and National meetings

MEMBERSHIP INFORMATION: Rich Newman, britishhorology@gmail.com

WEBSITE: britishhorology.org

Interested in British clocks and watches? Everyone is welcome to join our Chapter. Dues are only \$5 per year and every penny goes to educational purposes. Chapter member benefits include:

- Networking with 200 other fellow scholars and collectors interested in British and colonial American horology
- The *British Horology Times* newsletter and 30-year archive of past issues



Introduced by Chapter 159's vice president Ken Rockwell, speaker Seth Kennedy prepares to give his lecture on London horological engine turners to a packed audience at the 2023 National Convention.

- Information about upcoming online and in-person meetings
- Research assistance, restoration advice, and possible contacts
- Helping to promote the study and conservation of early timepieces

ZOOM PROGRAMS: Details are on our website (britishhorology.com). Be sure to check out our last Zoom presentation by renowned author and lecturer Sunny Dzik, "Engraving on English Table Clocks: Art on a Canvas of Brass."

JULY PROGRAM: Special thanks to antiquarian horologist Seth Kennedy for giving our last in-person lecture at our meeting at the 2023 Lancaster National Convention. His topic was "The London Horological Engine Turners."

UPCOMING MEETINGS:

- Mid-Winter Regional Meeting—St. Augustine, FL
Presentation: A gold pocket watch by George Graham (c. 1673–1751), presented by NAWCC Executive Director Rory McEvoy
- Southern Ohio Regional Meeting—Wilmington, OH
Presentation: Introducing Revolutionary Era Maker Richard Cranch, by NAWCC Silver Star Fellow Andy Dervan
- 2024 NAWCC National Convention—Chattanooga, TN
Presentation: Watch Jewel Making in 19th-Century England (with an American Connection), by author Dr. Ian Greaves

Looking for NAWCC Chapter officers and websites?

Visit nawcc.org/local-chapters

Everything you need to know about Chapters is easy to access online. Search for a Chapter by location or special interest to find contact information and links to Chapter websites.



Need to add or update your Chapter officers or website?

Email Alex at asimpkins@nawcc.org

2023 Award Recipients

National Association of Watch & Clock Collectors, Inc.

JAMES W. GIBBS LITERARY AWARD

This award was established in 1986 to recognize excellence in the field of horological literature. It may be awarded annually if there is a candidate nominated by NAWCC members to the Awards Committee for evaluation. A plaque will be presented to the award recipient at the NAWCC National Convention Awards Banquet. Applications for nominations for this award must be received at NAWCC Headquarters by April 30 preceding the National Convention.

BURT CIFRULAK (PA)

Burt has written a large number of articles on marine chronometers that have been published in the *Bulletin* in the past five years. In addition, he has co-authored *Bulletin* articles with George Meyer on the Adams & Perry Watch Co. of Lancaster, PA.

GEORGE MEYER (DE)

George coauthored several articles with Burt Cifrulak on the Adams & Perry Watch Co. of Lancaster, PA. He authored a *Bulletin* article on the Pritchard Prize watch of J. Frederick Sener.

GENERAL JAMES CAMPBELL PRICE AWARD FOR EXCEPTIONAL SERVICE TO THE NAWCC

This award is given in acknowledgment of continued achievement in the field of horology and valued contributions to the affairs of this organization.

TOM MCINTYRE (MA)

Tom has a long history of active service and leadership in many Chapters. He was past president of Chapters 87 and 174 and has given numerous presentations to many Chapters. He has participated as the chair of the

Symposium Committee and been a member of the Governing Documents Committee, Finance Committee, and Crafts Competition Committee. Tom has been instrumental in providing technical administration for the NAWCC's website and Forums, and the membership database. He is an NAWCC Silver Star Fellow and has served on the NAWCC Board of Directors.

LU SADOWSKI (NY)

This award was presented posthumously to Lu for her years of service and leadership in the NAWCC. She was a member of Chapters 1, 2, 84, and 148. Lu served as the Banquet Chair at the Midwest Regional and was a member of the Membership Committee and National Convention Committee. She was active in the Chapter Relations Committee and prepared numerous issues of the Chapter Relations newsletter. Lu was an NAWCC Silver Star Fellow.

KENNETH D. ROBERTS – SNOWDEN TAYLOR HOROLOGICAL RESEARCH AWARD

This award is for excellence in the field of horological research and will be awarded annually if a candidate is recommended by the Awards Committee. A plaque will be presented to the recipient at the National Convention. Nominations for this award must be in the hands of the Awards Committee by May 31 preceding the National Convention.

STAN CZUBERNAT (TX)

Stan has published many articles and maintains a webpage devoted to World War I era watches. He is a recognized authority, having published three books on these. His most recent book demonstrates a level of research that offers a significant departure from the accepted view of the origins of the waterproof watch case. By delving into the development of the Depollier Field and Marine Watch

case, he argues that there is ample evidence to support the idea that they developed the first watch case that met the modern standards of water resistance. He has done this by using archival military documents, court records, and historical advertising. The resulting 334-page book is recognized as being a valuable resource in the discussion of this aspect of watch manufacture.

G. RUSSELL OECHSLE (NY)

Russ Oechsle is one of America's leading experts on early 19th-century New York State clockmakers. Most recently, he is the author of *Without Equal: The Clocks of Abner Jones of Bloomfield, New York* (NAWCC, 2022), a book based on over 30 years of original primary source research. In preparing this book, Russ has carried on the Roberts–Taylor tradition by documenting more than 40 rare examples of Abner Jones's unique clocks; analyzing their case, dial, glass, and movement characteristics; and combining this evidence with documentary evidence from archival sources to elucidate Jones's life and work. Similarly, Russ is coauthor with Helen Boyce of the book *An Empire in Time: Clocks and Clock Makers of Upstate New York* (NAWCC, 2003).

SILVER STAR FELLOW AWARD

This award recognizes exceptional and meritorious achievement and service in support of the NAWCC and its purposes. It may be awarded only to members who have already achieved Fellow Award status and is presented to the recipient at the National Convention.

KEN HOGWOOD (FL)

Ken, a member of Chapters 195, 68, 19, and 159, has served in an executive capacity with several of those Chapters including the presidency of Chapter 42 and the vice presidency of Chapter 195. He is a recognized authority on carriage clocks, having published over a dozen articles in the *Bulletin* since his Fellow Award in 2015. Further, Ken has written many articles for the newsletter of the Carriage Clock Chapter. He has served as a speaker at both the Florida Mid-Winter Regional and the Mid-South Regional and has organized the exhibits for both as well as the programs for several Mid-South Regionals. He currently is a member of the NAWCC Publications Advisory and Review Board. At the National

Convention in 2018, and again at the 2023 Convention, Ken coordinated an exhibit of carriage clocks.

FELLOW AWARD

This award recognizes exceptional and meritorious achievement and service in support of the NAWCC and its purposes. It is administered by the Awards Committee and is given at a Regional or the National Convention.

KENNETH ARNOLD (TX)

For 44 years Ken has been an active member of Chapter 139. He has acted as president, vice president, secretary, and director at various times during his membership. He is a dedicated enthusiast who has shared his knowledge of repair techniques through many workshops. In addition, he has shared his knowledge of cuckoo and Bulle clocks through presentations to the Chapter. Over many years he has served the All-Texas Regional as chair of numerous committees and has served as the general chair for that Regional as well. Ken volunteered at the National Convention when it was held in Arlington, TX.

RICHARD BAKER (NY)

As a member of both Chapters 55 and 13, Dick has served as a director and also as vice president. His knowledge of wooden works and early American clocks has made him an extremely valuable member of the Cog Counters Chapter 194. Several authors have depended on Dick's knowledge and have referenced him as a resource in their books. He has presented many workshops on clock restoration both at the Chapter level and at Regional Conventions. He has taken an active role in assisting with the Eastern States Regional, having served as mart coordinator from 2015 to the present. Many organizations outside the NAWCC have benefitted from Dick's knowledge, as he has made presentations to collector societies and academic institutions on antique clocks and clock history. For many years, he has acted as a resource and volunteer at the Hoffman Clock Museum in Newark, NY.

STAN BOYATZIS (AUSTRALIA)

A member of Chapters 72 (First Australian) and 195 (International Carriage Clock), Stan has been intensely involved in disseminating his knowledge of carriage

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clocks. He has made many presentations at Regional meetings in Australia as well as at meetings of Chapter 72 and 180. He has served as vice president of Chapter 72. Stan's enthusiasm for carriage clocks led to him working with others to create Chapter 195, where he became the initial director and currently serves as president. He has authored numerous articles for the *Carriage Way* publication as well as the Chapter 72 newsletter. Stan was a speaker at the Ward Francillon Time Symposium in 2012 and again at the National Convention in 2015. He was co-chair of the exhibit at the National Watch & Clock Museum in conjunction with the 2018 National Convention.

ROBERT BURTON (KY)

Bob is a very active member of Kentucky Bluegrass Chapter 35 and has served on several of their committees and has been president of the Chapter. His leadership and participation as general chair of the Kentucky Bluegrass Regional over many years has ensured its success. The NAWCC has benefitted from Bob's efforts with the National Convention in 2016, when he served as mart co-chair, and in 2021 and 2022 where he was the volunteers coordinator for those National Conventions. He has served on the Board of Directors of the NAWCC since 2019 and acts as chair of the Chapter Relations Committee.

BILL BUTCHER (OR)

Bill is a member of Pacific Northwest Chapter 31 and has served in several executive capacities within the Chapter including the presidency. The members of the Chapter have benefitted from his mentorship in many facets of clock repair. As an authority, Bill has had three articles published in the *Oregonian* newspaper on the restoration work he did on a tower clock. He has led restoration teams on several tower and street clocks. At the National Convention in 1998, he was the program chairperson and has served in that capacity at every Pacific Northwest Regional for at least 25 years.

BRUCE FORMAN (IN)

As a member of the NAWCC for over 30 years, Bruce has made many contributions as a Chapter member, including the presidency of Chapters 1 and 3. He has been and continues to be the editor of the *Horological Tools* Chapter 173 newsletter and serves on that Chapter's board. His contributions to the Mid-Eastern, Mid-West, and Mid-South Regionals have been varied and exemplary. Bruce serves on the National Library Collections

Committee and has been a speaker at the Ward Francillon Time Symposium. The NAWCC has benefitted from his scholarship in over 30 articles that he has published in the *Bulletin* as well as his book *The Clockmakers of Montgomery County 1740–1850*.

MARK FRANK (IL)

Mark joined the NAWCC in November 1993 and is a member of Chapters 3, 134, and 159. He has contributed a number of informative videos to the NAWCC Library on various topics, including his astronomical skeleton clock. He has served on the Symposium Committee, the Museum Collections Committee, and has served on the Executive Director Search Committee. He has shared his work on his astronomical skeleton clock at NAWCC Regional and National meetings as well as providing articles for the *Bulletin* and on the internet.

ROBERT GEIER (TN)

Bob Geier has been very actively involved as a Chapter officer of Tennessee Valley Chapter 42. In addition, he is currently secretary of Chapter 24 in Atlanta. When the recent pandemic prevented in-person meetings, Bob organized online meetings for the Atlanta Chapter. He has made presentations to Chapter 42 and serves as editor for Chapter 24's newsletter. He is a member of the National Convention Committee and has been co-chair of the Mid-South Regional. On several occasions, Bob has been the auction chair for the Mid-South Regional.

MICHAEL GOODWIN (OH)

Mike is a valuable member of Buckeye Chapter 23 and has given many workshops to the members of that Chapter. He has been an officer of the Chapter and is a great resource to the members of the Chapter in troubleshooting their problem clocks. He was a speaker at the 2022 National Convention and has acted as security chairman at several National Conventions as well as acting in that capacity at the Southern Ohio Regional for the last 14 years. Mike has been an evaluator for several "Roadshow" events held at museums.

ROBERT HOLMSTROM (OR)

In 1999, Bob took over as editor of the *Horological Science Newsletter* (HSN) and as president of Horological Science Chapter 161. He has been editor and publisher ever since. As well as editing HSN, in the past two decades Bob has submitted more than 70 articles to HSN. He has been a

speaker at the Pacific Northwest Regional. In addition, Bob is a motivator and his efforts have resulted in several Ward Francillon Symposium speaker talks and articles. Along with Fortunat Mueller-Maerki, Bob developed "Bibliographia Horologiae Mundi" available on the website hsn161.com, which was his creation.

DONALD JACKSON (GA)

Donald Jackson is a member of Atlanta Chapter 24 and has been a Chapter officer there. In his 19 years of membership in the NAWCC, he has made many presentations to the Chapter and at the Mid-South Regional. He has served as the mart chairman on many occasions for the Mid-South Regional and also as the exhibit chair for that Regional. At the National level, Donald served as the mart chair for the 2015 National Convention.

PETER SCHREINER III (FL)

Having joined the NAWCC in 2006, Peter Schreiner is a member of Florida Suntime Chapter 19, Atlanta Chapter 24, Jean Ribault Chapter 68, Daytona Beach Chapter 154, and International Carriage Clock Chapter 195. He has made many presentations to Chapter 24 and has served as photographer for their meetings as well. In addition, he has been a Chapter officer of Chapters 24 and 154. His photographic skills have been appreciated, as he has put them to use as the official photographer of several NAWCC National Conventions and the Mid-Winter Regional in Florida on many occasions. Pete has contributed several articles to the *Bulletin* as a coauthor with both Randy Jaye and George Waterhouse. He and other Chapter 24 members have been involved in horological activities in the Governor's Mansion for the State of Georgia.

ANDY STATON (TX)

Andy Staton joined the NAWCC in 1977 and is a founding member of San Jacinto Chapter 139. He served as a director and as president of that Chapter. He has also been a director and officer in Southwestern Chapter 15. Andy contributed to the success of several symposia and had an active role in the NAWCC Convention when it was held in Arlington. The annual All-Texas Chapters Regionals are greatly enhanced by Andy's able coordination and oversight of the famous "It's For Free" events and silent auctions in the mart room. He has also helped chair several exhibits. He was chair of the group who restored three clocks in Galveston: a tower clock, a street clock,

and a bank gallery clock. Andy contributed several horological crosswords to the *Bulletin*. His devotion to the NAWCC and clocks and clock history has made Andy an excellent speaker and promoter of the NAWCC.

MARY THATCHER (OH)

Mary belonged to the NAWCC for 49 years until her passing. From the late 1990s, she served as the hospitality chair of Buckeye Chapter 23. This included coordinating banquets for the Southern Ohio Regional as well as special activities for that Regional. In addition, Mary was responsible for coordinating catered events at two National Conventions in Dayton: in 2013 and again in 2022. She was greatly involved in registration for the Southern Ohio Regional and ensured that there was a sufficient number of people to handle the registration at these events. In addition she donated computer equipment to the Chapter for the use of the Chapter secretary and for the Southern Ohio Regional.

CRAIG WHITE (WI)

As a member of Chapters 47, 159, and 179, Craig has been very involved with the NAWCC, having given 10 lectures to Chapter 47 between March 2010 and March 2022 as well as four Regional lectures between March 2019 and March 2022 and a lecture at the 2021 National Convention on the Ferguson clock. He was the chair of the National Convention when it was hosted in Milwaukee in 2014. Craig was also on the Registration Committee of the Midwest Regional in 2013 and 2014. From 2021 until now, he has served on the NAWCC Awards Committee. In 2006, his article on Japanese clocks appeared in the *Bulletin*. Additionally, Craig gave a three-part lecture on horology at the University of Wisconsin Milwaukee campus in 2017. He currently is the president of Chapter 47, a position he has held for some time.

JEFFERY ZUSPAN (TX)

Jeffery has belonged to the NAWCC for 55 years and contributed in many ways at the local, Regional, and National levels. He has made many presentations to Chapter 139 and served in several executive capacities including president of the Chapter. He has served as Regional general chair as well as various special chair responsibilities for the All-Texas Chapters Regional in addition to making presentations at several of those Regionals. Jeffery served as chairman for the National Convention's Crafts

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Competition in 1999 and served on the Chapter Relations Committee of the NAWCC. As publicity chair for the 1990 Ward Francillon Time Symposium, he coauthored an article with Gene Fuller for the *Bulletin*.

NAWCC GOLDEN CIRCLE AWARDS

An award to recognize the achievement of 50 years of continuous membership in the NAWCC is granted automatically, and recipients receive a certificate and a special membership pin.

Thomas Askew (MI) • Chris H. Bailey (FL) • Robert Ballenger (OR) • Glenn H. Bebout Jr. (FL) • Lawrence E. Bernard (CA) • Lawrence Bielamowicz (TX) • Cornelius C. Blevins (IA) • John Bockelmann (NY) • Gene Bottorff (GA) • Edward L. Brown (GA) • Robert N. Chambers (FL) • Harold Cherry (NY) • Larry Childs (IN) • A Scott Childs (KS) • George N. Coller Jr. (PA) • Steven G. Conover (PA) • Jim Curran (ON Canada) • Franklin Dey (CA) • Ray Dobrin (NY) • Pat Drohan (IL) • Paul E. Egan (CA) • Thomas L. De Fazio (MA) • Paul J. Foley (MA) • John L. Fontaine (MA) • Marcene Frantz (PA) • Edward J. Gallatin (WA) • James Gilmore (CA) • Richard A. Goldman (SC) • Thomas E. Grimshaw (CT) • William H. Hanenburg (CA) • Richard H. Hanewald (PA) • Dennis Hankinson (AR) • Paul E. Haringa (CT) • Bruce Hilt (MI) • Gary D. Hooper (SC) • John Huber (TN) • Johnny Ingram (TX) • Hugh H. Jay (CA) • Karl K. Kappel (WI) • Michael J. Karagozie (MA) • Chuck Kays (KY) • Donald B. Keeton (OH) • Arthur L. Kile (KY) • Rodney King (OK) • Stephen L. Kramer (AZ) • Richard N. Kreher (MO) • Dave C. Kronenwetter (PA) • Joseph P. Kuechle (MI) • Robert A. LaGanza (WY) • Joseph Landesberg (NY) • Robert B. Lansing (NY) • Daniel E. Laub (NY) • M. R. Lewbel (FL) • Richard Lipman (MA) • Albert L. Mayer Jr. (OH) • George E. McInnis (FL) • James D. Mehrer (FL) • Ansel E. Miller (SC) • Paul H. Miller (WA) • Warren Milne (ON Canada) • Ben Mischey (OH) • John H. Moore (FL) • W. Scott Nainis (MD) • Rock Newton (CA) • John Okonski (TX) • Ruth Overton (MO) • Michael Parker (Australia) • Raymond E. Pavkov (CT) • Ancel Peckham (CO) • W. W. Peters (NY) • Michael Pinz (NY) • William L. Pistor Jr. (OH) • William V. Prieur (CA) • Joe Plunkett (TX) • David G. Reynolds (TX) • Anthony W. Ricci (NC) • Mary C. Roehrich (PA) • Jerry A. Rosati (OH) • Alex H. Sallwey (VA) • Robert O. Schmitt

(AZ) • Linda R. Schulz (CA) • Allen G. Schumacher (IL) • William Seideman (CT) • Ronald H. Spence (Canada) • Nelson F. Stammer (MD) • R. M. Starnes (CA) • Martin C. Steenbock (NJ) • Holly Stephenson (AZ) • Allen L. Stevenson (CO) • Gary W. Thompson (UT) • August B. Thumm (OH) • Thomas F. Tognetti (CA) • Thomas J. Tulauskas (MI) • George Waterhouse (GA) • Gregory L. Wilde (WI) • Dan E. Witt (VA) • H. Ronald Wohlrab (PA) • Philip L. Wood (NC) • Emery A. Worthington (AL)

NAWCC 60-YEAR AWARDS

An award to recognize the achievement of 60 years of continuous membership in the NAWCC is granted automatically, and recipients receive a certificate.

Joseph J. Abrams (PA) • Addison H. Clipson (OH) • Douglas G. Cummings (IL) • William Gesswein (AZ) • F. A. Schumacher (NJ) • Ralph L. Whitmer Sr. (VA) • Aubrey L. Wilkerson (TN)

REGIONAL RECOGNITION

ALL-TEXAS CHAPTERS

CHAPTER CITATION San Jacinto Chapter 139 • Southwestern Chapter 15 • Five State Collectors Chapter 80 • Lone Star Chapter 124 **REGIONAL APPRECIATION** Ken Arnold (TX) • Darrah Artzner (TX) • Chris Bailey (FL) • Avin Brownlee (TX) • Stephen Egloff (TX) • Tim Glanzman (TX) • Randy Hohlt (TX) • Kevin Killian (TX) • Joseph P. Kuechle (MI) • Nita Mixon (TX) • Hilda Norris (TX) • Thomas J. Norris (TX) • Kyle Rogers (AR) • Desmond Rolf (TX) • Gordon Shahin (TX) • Andy Staton (TX) • Lori Staton (TX) • William Zukley (TX)

EASTERN STATES

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Raymond A. McGeary

By Jeff McGeary (PA)

Raymond A. McGeary, 83, passed away on November 14, 2023.

He is survived by his wife, Gay O. McGeary; son, R. Jeffrey McGeary (Susan); grandchildren, Olivia L. McGeary and Colton E. McGeary; daughter, Meghan McGeary (Chih Kwang), and brother, Clyde M. McGeary.

Ray graduated from Muskingum University with a bachelor's degree in history in 1962 and received his law degree from Duke University School of Law in 1965.

He became a trust and estates banker and resided for many years in Sewickley, PA, before moving to Carlisle, PA, and serving as the director of development for Dickinson School of Law.

In retirement, Ray enjoyed antiques, books, history, and clocks. He was a member of NAWCC Keystone Chapter 158. He served the community as a member of the Exchange Club, and was a long-standing member of the Cumberland County Historical Society.



In Memoriam articles for the *Watch & Clock Bulletin* are written to mark the passing of an NAWCC member. Submission guidelines are as follows:

- A maximum of 550 words submitted in a Word document. Including birth-death dates is recommended. Text will be edited for grammar, spelling, style, and word count.
- Images are optional, and there is typically a limit of one image. High-resolution images are preferred (a minimum of 300 dpi or 1,000 kb) and must be submitted as a separate .jpg, .tiff, or .pdf file. Do not embed the photo in the Word doc. Images of very low resolution/quality may be rejected.
- The author's name and state must be included.
- Deadlines for In Memoriam articles are the first of the month, 60 days prior to publication (e.g., the deadline for the March issue is January 1).
- Send text and image files to editor@nawcc.org.

In Memory Of

We recognize here those individuals and Chapters whose gifts to the NAWCC were given in memory of fellow members.

Susan B. Ellison given by International 400-Day Clock Chapter 168

Susan B. Ellison given by Electrical Horology Society Chapter 78

Susan B. Ellison given by Frank & Virginia Servas

Susan B. Ellison given by Andrew H. & Linda I. Dervan

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Dorothy Gold
116827 Pittsburgh, PA

Bruce Hall
125355 Golden, CO

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4709 San Jose, CA

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Cryptogram

MARCH/APRIL 2024

A cryptogram is a word puzzle in which one letter stands for another. If you think X = O, it will equal O throughout this entire puzzle. The solution is trial and error. Puzzle solvers, please email your answer, name, and Chapter affiliation to mart@nawcc.org. All emails will be acknowledged (if you receive no acknowledgment, please resend). Mail your answers to NAWCC, Inc., Attn.: Publications Dept., 514 Poplar St., Columbia, PA 17512-2130. Your name will be listed in the next available puzzle section. (Clue F = D).

F̄ Ḡ Q̄ H̄ H̄ K̄ Ḡ V̄ P̄ Ḡ B̄ C̄ P̄ Ȳ J̄ C̄ ? H̄ K̄ C̄ Ō F̄ Ḡ
 Ō Ḡ H̄ Q̄ Ē V̄ X̄ Ō F̄ C̄ L̄ H̄ Ȳ D̄ C̄; J̄ Ḡ L̄ H̄ K̄ X̄ H̄ Q̄
 H̄ K̄ C̄ Q̄ H̄ V̄ J̄ J̄ P̄ Ȳ J̄ C̄ Ȳ Q̄ D̄ X̄ F̄ C̄ Ḡ J̄.
 — Ū C̄ Ō W̄ X̄ D̄ Ȳ Ō J̄ L̄ X̄ Ō Ī P̄ Ȳ Ō, R̄ Ḡ Ḡ L̄
 L̄ Ȳ Z̄ K̄ X̄ L̄ F̄ Q̄ X̄ P̄ D̄ X̄ Ō X̄ Z̄ Ī

The Adventures of Sherlock Holmes – *The Dilemma of Prisoners*



Inspector Lamainspring barged into the sitting room of Sherlock Holmes and Dr. Watchson and exclaimed, "My head is killing me!" "What on Earth have you been doing today?" asked Dr. Watchson, as Sherlock lowered his evening paper to look at the Inspector. "He has been interrogating three people at the station with the help of Officer Gear, obviously," said Sherlock, as he raised his paper. "How do you know that?" asked Inspector Lamainspring incredulously. "The cigarette ashes of those horrible things that Gear smokes are arranged on your shoulders and sleeve in three distinct spots, indicating that he has been standing behind you in three places for an extended period as the two of you adjusted your attention to three separate spots, evidently three persons. The creases on your jacket forearms, the lack of creases across your legs, and the sweat on your breast-pocket handkerchief indicate that you have been leaning on a table not high enough for you to cross your legs, in a very warm room, which would make anyone think of the Interrogation Room at the local constabulary," said Sherlock without even lowering his paper.

"That is all correct," said the Inspector, somewhat flustered, "so perhaps you might help me figure out what they said. All three of them are sometime accomplices of Professor Moritempus and so are always cryptic in their statements. We know that only one of them was involved in a recent watch heist and two are innocent of that crime. They are obviously of three different ages and heights. From our questioning we know that they are named Misters Awful, Belligerent, and Callous, but we don't know which is which. The shorter of Awful and Belligerent is the older of the innocent two. The younger of Belligerent and Callous is the shorter of the innocent two. The taller of Awful and Callous is the younger of the innocent two. But that's as far as we've gotten after hours of questioning, and we don't know how to proceed." "Well, you can proceed by arresting your heister, because you already have enough information to identify him," said Sherlock.

If you figure out the name and how to identify the watch heister, email your answer, name, and Chapter number to SherlockPuzzle@nawcc.org, and you will be mentioned in the next issue. (Courtesy of Jim Guinn)

Puzzle Answers

JANUARY/FEBRUARY 2024

Cryptogram Answer: A gentleman's choice of timepiece says as much about him as does his Savile Row suit.

—*Ian Fleming*

The Adventures of Sherlock Holmes — Sum Difficulties

The Sierra family must be made up of three boys and four girls. Each boy has two brothers and four sisters while each girl has three brothers and three sisters. (To be honest, I can't remember where I first heard this brother/sister puzzle, and so I apologize for not referencing the person who first conceived it!) There are two solutions to the sum problem, $9+8+7+65+4+3+2+1=99$ and $9+8+7+6+5+43+21=99$. I borrowed the idea for this puzzle from Boris A. Kordemsky's wonderful book, edited by Martin Gardner, *The Moscow Puzzles* (Dover Publications, Inc., 1992), which is a slightly altered, slightly corrected reprint of the work first published by Charles Scribner's Sons (1972).

Congratulations to the NAWCC members who submitted correct answers. The Chapters with the most solvers are 124 and 194. The names are listed below in the order received.

Cryptogram – Jan/Feb 2024

Bob Ballenger — Ch 31

Stuart Gray

Barb Cline — Ch 29

Paul Manfredo — Ch 37

Greg Ruda — Ch 6, 194

Fritz Lotze — Ch 59

Jim Powers — Ch 8, 89, 189, 194

Marietta & George Matto — Ch 31

Chuck Montrose — Ch 84

Verlyn Kuhlmann — Ch 59, 136, 178, 180

John Cox — Ch 17

Deb Lockwood — Ch 55

Terrence Turgyan — Ch 142

Terry & Molly Shuya — Ch 68

Majorie Wilson — Ch 119

Dick & Dorothy Baker — Ch 13, 55

Ron Jensen — Ch 34

Phil Carthage — Ch 8, 89

Cheryl Comen — Ch 148, 2

Bill Yee — Ch 31

Chuck Edwards — Ch 124

Bill Scales — Ch 5

Robert Linkenhofer — Ch 136, 178, 180

Nancy Burke — Ch 37

Dale Kiesewetter — Ch 12, 134, 194

Art Kruppenbacher — Ch 13

Mark Stevens — Ch 3

Pat Holloway — Ch 15, 22, 120, 124, 139, 195

George Augustas — Ch 124

Neil Gallensky — Ch 160

Randy Grunwell — Ch 24

Becky Haney — Ch 42, 16

Richard Beach

Gary Knapton — Ch 171

George Emery

Mike Graham — Ch 84, 148

Jim Wynne — Ch 34

Ralph Ferone — Ch 3, 47, 66, 159, 194, 195

Ed Sass — Ch 124

Jim Bryant — Ch 89, 22

Pam Hall — Ch 32

Mike Essi

Jim Hartog — Ch 119

Bob Feiertag — Ch 22, 23

John Wilman — Ch 84

Robert Bulver — Ch 91

Cryptogram – Nov/Dec 2023

Rich Junttonen — Ch 6

John Cox — Ch 17

George Winkle

Mark Stevens — Ch 3

Sherlock Holmes —
Sum Difficulties

Steve Hossner — Ch 31

Terry and Molly Shuya — Ch 68

John Cox — Ch 17

Chuck Montrose — Ch 84

Tim von Reyn — Ch 89

Stuart Gray

Art Kruppenbacher — Ch 13

Randy Grunwell — Ch 24

George S. Augustas — Ch 124

Jeffrey Schuldenfrei

Bill Scales — Ch 5

Weston Griffin — Ch 40

Terrence Turgyan — Ch 142

Nancy Burke — Ch 37

Chuck Edwards — Ch 124

Edward Martin — Ch 28

Jay Broad — Ch 14

Mike Essi

Jim Hartog — Ch 119

Bob Feiertag — Ch 22, 23

Ed Sass — Ch 124

Sherlock Holmes —

An Ominous Sign

Tim von Reyn — Ch 89

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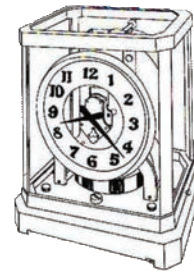
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SAVE THE DATE

2024 Mid-Eastern Regional

November 1 – 2
York Expo Center
334 Carlisle Ave.
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More info coming soon in future Bulletins

The NAWCC, its officers and members and the Mid-Eastern Regional are not responsible for any loss, injury or tort during the event.

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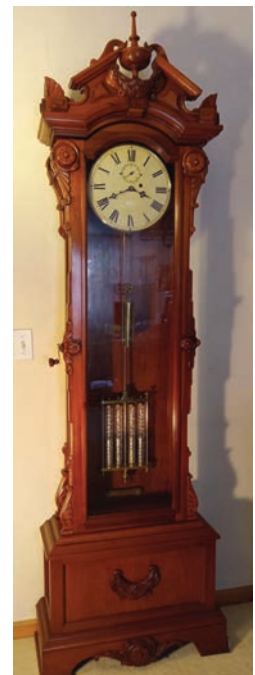
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The NAWCC reserves the right in its sole discretion to reject, edit, or otherwise refuse to publish any advertisement without recourse to the NAWCC. All advertisements received, whether from a member, organization, or other party, are received subject to this condition and without recourse to the NAWCC. Statements of opinion or fact appearing in the Watch & Clock Bulletin are accepted as the advertiser's own. While the NAWCC strives to ensure that only reputable advertisers appear in its publications, it assumes no responsibility for the accuracy and correctness of any statements of its advertisers. Neither the NAWCC, nor the officers, nor any of its employees will be responsible for any losses or misunderstandings arising from any of these listings.

The deadline for receipt of advertisements and payment is 3 p.m. Eastern time on the first of the month prior to the month of publication. The NAWCC reserves the right to edit and place all copy.

Alerts regarding stolen items are listed at no charge in one issue only.



School of
HOROLOGY

The NAWCC School of Horology is located in Columbia, PA, and its educational programs serve to stimulate interest in and preserve knowledge of horological crafts. We look forward to welcoming you to future classes!

Upcoming Classes

April 23–25: American Clock Time/Strike Movement
(New England Regional)

May 3: Introduction to Antique Clocks (Columbia, PA)

May 4: American Shelf Clock Tablets with Stenciled Borders
(Columbia, PA)

June 12–14: American Clock Time/Strike Movement
(National Convention)

October 23–26: Introduction to Chime Clocks (Shalimar, FL)

Connect with other time enthusiasts at the School for education, horological advocacy, and comradery!

Visit nawcc.org/education to register

You are Invited to the
**54th Annual
 EASTERN STATES
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 AUGUST 2-3, 2024**

Sponsored by Chapters 55, 13 & 33
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54th

ESR

EASTERN STATES REGIONAL

August 2-3, 2024

See www.nawccesr.com

**For the Full Schedule of Events and
 other information**

GENERAL SCHEDULE

FRIDAY: Registration: 4 p.m.-6 p.m. **Mart Set-Up:** 4 p.m.-6 p.m.; **Early Mart Access** 4:30-6 p.m.
Lectures: 7 p.m. and 8 p.m.

SATURDAY: Registration: 8a.m.-3 p.m. **Mart Set Up:** 8-9 a.m.; **Mart & Public Day:** 9 a.m.-4 p.m.
Chapter Meetings & Silent Auctions: Throughout the Day. **WORKSHOPS:** Hands-on Workshops and
Demonstrations will run Friday and Saturday. See www.nawccesr.com. **Silent Auctions:** During Mart hours.

ROOM RESERVATIONS: Consult nawccesr.com. Call the hotels directly and mention ESR-NAWCC meeting.

Reduced room rates apply only until July 2nd! Reserve rooms early! Note that non-guaranteed reservations held only until 4pm on the day of arrival.

REGISTRATION: Current NAWCC membership required on 8/2. Full Public Day on 8/3. **MART:** Restricted to Horological-related items Only. Only MART table-holders with proper badge ID will be allowed in the Mart during set-up time on Aug. 2nd from 4-6 pm unless attendees have paid additional fee for **Early Mart Access**. Mart Set-Up Aug.3rd from 8-9am, and Mart open to all at 9 a.m. **The MART closes for all at 4 pm on August 3rd – we ask all table holders to please respect this time.** SILENT AUCTION requires a \$3 per-item fee.

DUE TO LOCAL ORDINANCE ABSOLUTELY NO BUYING OR SELLING IN THE PARKING LOTS!

NOTE: The Eastern States Regional, NAWCC, its officers and members are not responsible for any loss, injury or tort during this meeting.
CHECKS MUST BE IN U.S. FUNDS AND DRAWN ON U.S. BANKS. CONFIRMATIONS WILL BE MADE BY EMAIL ONLY IF ADDRESS IS LEGIBLE ON THIS FORM. ONLY Registrations received by **July 20th** will be accepted for pre-registration. Pre-Registration packets will be available at the desk for table holders Friday August 2nd at 3pm. NO cancellation and/or refunds guaranteed after 7/20/24.

Questions? Contact Chair Dave Richardson at dprichardson43@gmail.com

NAME & NAWCC #: _____

PHONE # _____ EMAIL: _____

ADDRESS: _____ CITY: _____ STATE/PROV.: _____

Registration @ \$30 ea. X _____ = _____ (Cost is \$35 at the door) ZIP: _____

Early Access Friday @ \$20 ea. X _____ = _____ Make checks payable to: **EASTERN STATES REGIONAL**

MART TABLE @ \$45 ea. X _____ = _____ Mail your registration to: **Philip DelPiano
 123 Hilson Drive
 Rome, NY 13440-0801**

TOTAL AMOUNT: \$ _____

Note: For Name Tag purposes, please add names of spouse and/or other family members attending and NAWCC #s below: (Note: pre- registration packets will be filed under first last name listed on the registration form.)

Pacific Northwest Regional

Friday, May 17 - Sunday, May 19, 2024



Monarch Hotel and Conference Center

Host Chapters: Mt. Rainier #135, Pacific Northwest #31
Co-hosts: British Columbia #121, Inland Empire #53

Taco Bar
Sponsored by
Ben Bridge Jeweler

General Chairman: Jack Goldberg 425-392-2554
Registration: Tony Pavlakis 206-300-0686
Open to the Public Saturday, May 18 and Sunday, May 19

Ben Bridge

Friday, May 17

10:00AM Table Holder Entry
12:00PM Early Entry Registrants
2:00PM Mart Opens NAWCC members only
6:00PM Mart Closes
6:00PM Social Hour
6:30PM Taco Bar

Saturday, May 18

8:00AM Registration Opens
8:45AM Table Holders Entry
9:00AM MART Opens
Open to Public
4:00PM Free Table Unveiled
5:00PM MART Closes
6:30PM Banquet

Sunday, May 19

9:00AM Mart Opens
Open to Public
Registration Opens
1:00PM Money Mart Drawing
2:00PM MART Closes
4:00PM Security Ends

- Only NAWCC members, spouses, and their children under 18 will be admitted to the mart on Friday.
- If you are registering anyone other than immediate family, list their NAWCC numbers.
- Table holders requesting adjacent tables must register in the same envelope (only one last name per table).
- NAWCC Regional rules apply and will be enforced.
- Officers and members of the NAWCC and 2024 Pacific Northwest Regional are not responsible for any loss, damage, injury, or tort during the Regional.

Monarch Hotel and Conference Center

12566 SE 93rd Clackamas, OR 97015, 800-492-8700 or 503-652-1515. Complimentary shuttle bus provided to and from Portland Airport. **The Monarch is making a special offer for our attendees: Confirmed convention rate of \$129 + taxes for a single or double room. You must call and make a reservation by April 16, 2024.** Be sure to call early as rooms fill quickly. Check here if you plan to stay at the Monarch Hotel.

No confirmations mailed or refunds made after April 16, 2024



Check Box (if applicable) []Fellow []Old Timer []Silver Star []National Officer

Last Name _____ First _____ NAWCC # _____

Additional Badge (Spouse/children) _____ (Under age 18 free)

Address _____

City _____ State _____ Zip _____

Email _____ Phone/Cell _____ Emergency Contact (Optional) _____

Registration Member*.....	_____ @ \$45.00 ea _____	Make Checks Payable to: Mt Rainier Chapter 135 Mail to: Rob Apsel 1916 141 st Pl SW Lynnwood, WA 98087 apsel@comcast.net
Significant Other.....	_____ @ \$45.00 ea _____	
Saturday Dinner Banquet.....	_____ @ \$30.00 ea _____	
Full Mart Table (6ft).....	_____ @ \$40.00 ea _____	
Early Entry.....	_____ @ \$40.00 ea _____	

Donation** *Thank you!* _____

Total Enclosed \$ _____

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To see full schedule and program activities please visit <http://nawcc135.org/regional.html>.

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ISSUE	AD DUE DATE	ISSUE	AD DUE DATE
JANUARY/FEBRUARY	DECEMBER 1, 2023	JULY/AUGUST	JUNE 3, 2024
MARCH/APRIL	FEBRUARY 1, 2024	SEPTEMBER/OCTOBER	AUGUST 1, 2024
MAY/JUNE	APRIL 1, 2024	NOVEMBER/DECEMBER	OCTOBER 1, 2024

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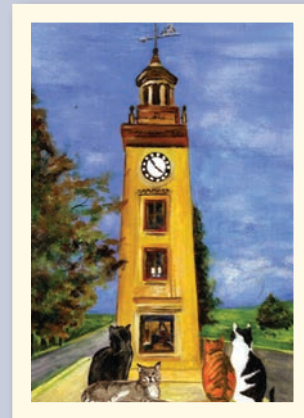
DOWNLOAD ADVERTISING GUIDELINES AND RATES AT NAWCC.ORG/PUBLICATIONS.

Questions? Contact the Advertising Coordinator at mart@nawcc.org or 717.684.8261 ext. 208.

COMING TO THE MUSEUM STORE IN SPRING 2024

Specially commissioned prints by Columbia, PA, artist Joan Inman feature whimsical cats at the National Watch & Clock Museum.

The Museum is proud to partner with the nonprofit Columbia Cat Action Team to support the local community and present this charming artwork.

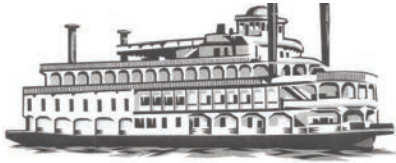


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River Cities Regional



City Center Church Fitness Building
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Free Parking!

April 5-6, 2024
Lenexa, Kansas

Host: Heart of America No. 36 - Kansas City
Co-Host: Great Plains No. 58 - Omaha

SCHEDULE OF EVENTS

Educational Program:
Briggs Rotary Pendulum Clocks
PRESENTED BY: **JOE JOAR**

Friday, April 5	Saturday, April 6
8:00 am Registration Opens	8:00 am Registration Opens
8:30 am Mart Set-up	8:30 am Mart Opens
9:00 am Early Bird Admission	9:00 am Kids' Corner
10:00 am Mart Opens	9:30 am Mart Opens to Public
1:00 pm Mart Opens to Public	10:30 am Tour of Exhibit Clocks
1:30 pm Educational Program	1:00 pm Drawing for table holders
5:00 pm Mart Closes	1:30 pm Mart Closes

PUBLIC ADMITTED FRIDAY & SATURDAY

Lodging — Marriott Springhill Suites 17190 W 87th St, Lenexa, KS 913-225-9955
Only 3 blocks east of City Center Church Fitness Building
0.5 miles west of I-435 KANSAS, Exit 3

Special River Cities Regional rate of \$155 includes breakfast.

Cutoff date for 2024 River Cities Regional ends March 11, 2024. Book online for special rate.

<https://www.marriott.com/event-reservations/reservation-link.mi?id=1704745101497&key=GRP&app=resvlink>

Our regional and the host hotel are conveniently located for easy access to the National WWI Museum and Memorial, Nelson-Atkins Museum of Art, Arabia Steamboat Museum, Harry S Truman Presidential Library and Museum, Union Station, The KC Wheel, Country Club Plaza shopping, and casinos.

REGISTRATION

(Only for NAWCC members, their spouses and children under 18)

Member _____	NAWCC Number _____
Spouse _____	NAWCC Number _____
Child(ren) _____	Telephone _____
Address _____	City/ST/ZIP _____
Email Address _____	(used for confirmation)

Payment in US Dollars or checks written on US Banks

Checks payable to: **2024 River Cities Regional**

Mail to: Nancy Spieker
10908 W. 52nd Circle
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Telephone 913-485-4096
Email: nspieker99@gmail.com

General Chair: Mark Parkins
Telephone 913-208-5369
Email: parkins66209@yahoo.com

Pre-Registration Closes March 27, 2024.

Pre-registration	___ @ \$25	Subtotal \$ _____
At the DOOR	\$30	
Child(ren)	___ @ FREE!	Subtotal \$ _____
Early Bird Pass	___ @ \$10	Subtotal \$ _____
8 ft. Mart Table(s)	___ @ \$40	Subtotal \$ _____
<i>(Buy 4 tables, get 5th free!)</i>		
Total		\$ _____

Table holders wishing to be together **must** register together in the same envelope.

Sales taxes **must** be collected on all sales.

Table Holders will offer to sell items primarily of horological interest and ensure that non-horological items in the mart are appropriate for NAWCC events and of interest to members, as determined by the Regional Chairperson.

The NAWCC, its officers, members, and the River Cities Regional are not responsible for any loss, injury, or tort during this event.



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www.ahsoc.org



AHS members have additional access to a bigger and growing set of online resources as part of their subscription, including free-text searchable access to *Antiquarian Horology* from 1953 to two years ago, *Horological Journal* from 1858 to two years ago, *Watch and Clock Maker* from 1928 to 1939, *Horological Review* from 1964 to 1965, and the Electrical Horology Group's Technical Papers series. Full details are found on our website under 'Resources'.

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The American Watchmakers-Clockmakers Institute

March 15-18
Atlanta Jewelry Show
Atlanta, Georgia

Education and networking will be the name of the game for AWCI in its appearance at the Atlanta Jewelry Show, as AWCI Education Director Jason Champion, CW21, will be spending four days giving several informative presentations to attendees.

April 1-5
Introduction to Watchmaking
Instructor: Jason Champion, CW21
AWCI Headquarters, Harrison, Ohio

A survey course for the new or prospective watchmaker covering the basic skills and techniques used by the modern watchmaker. This class is perfect for anyone thinking about entering the profession of watchmaking or for the individual who just wants to gain a better appreciation for the art of watchmaking.

April 22-26
CW21 Exam
AWCI Headquarters, Harrison, Ohio

Limited components will be offered at this time, but we are very excited to be back with our exam. Please review the documents and information at <https://www.awci.com/event/cw21-5-3/>

May 6-10
Modern Automatic Watches
Instructor: Jason Champion, CW21
AWCI Headquarters, Harrison, Ohio

The purpose of this course is to teach the student all the fundamentals of modern mechanical automatic watch repair that are most prevalent on today's market. The student will learn how to perform the various diagnostics in evaluating the condition of the various components, cleaning, assembling, adjustments, dialing and casing.

May 13-17
Quartz and Quartz Chronograph Service, Procedures and Diagnostics
Instructor: Jason Champion, CW21
AWCI Headquarters, Harrison, Ohio

The purpose of this course is to teach the student all the fundamentals of modern quartz watch repair and quartz chronographs that are most prevalent on today's market. The student will learn how to perform the various important electronic tests e.g. current consumption, coil resistance, lower working voltage, fault finding etc.



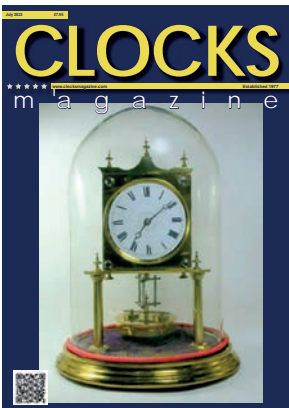
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Dates to Remember

Access information about Regionals, the Convention, and the Symposium from nawcc.org » **Events**. All Regional meetings must be scheduled through Convention Committee Coordinator John Koepke, PO Box 21263, El Sobrante, CA 94820 • 510.236.2197 • jskoepke@comcast.net. This listing includes events that have been confirmed as of January 27, 2024.

2024 NAWCC NATIONAL CONVENTION

June 13–16, 2024 • Chattanooga, TN
Co-Chairs: Chris Martin and Glen Kitts

2024 NAWCC WARD FRANCILLON TIME SYMPOSIUM

October 21–24, 2024 • Sturbridge, MA
Chair: Cathy Gorton

MARCH 2024

MARCH 8-9—ARIZONA SUNSHINE

Host: Valley of the Sun Ch. 112
Cohost: Keywinders of Arizona Ch. 46
Location: Fountain Hills Community Center and Fountain Park Hotel, Fountain Hills, AZ

APRIL 2024

APRIL 5-6—RIVER CITY*

Host: Heart of America Ch. 36
Location: TBD
National Representative: Rhett Lucke

APRIL 11-13—SOUTHERN OHIO

Host: Buckeye Ch. 23
Cohost: British Horology Ch. 159
Location: Roberts Centre and Holiday Inn, Wilmington, OH
National Representative: John Cote

APRIL 26-27—NEW ENGLAND*

Host: New England Ch. 8
Cohosts: Greater Massachusetts Ch. 87, Connecticut Ch. 148, New Hampshire Ch. 189, Vermont Ch. 109, Maine Ch. 89
Location: Douglas N Everett Arena and Holiday Inn Concord Downtown, Concord, NH
National Representative: Bob Burton

MAY 2024

MAY 17-19—PACIFIC NORTHWEST*

Host: Mt. Rainier Ch. 135
Cohosts: Pacific-Northwest Ch. 31, Inland Empire Ch. 53, British Columbia Ch. 121
Location: Monarch Hotel and Conference Center, Clackamas, OR
National Representative: Sherry Kitts

JULY 2024

JULY 26-28—ROCKY MOUNTAIN*

Host: Colorado Ch. 21
Cohosts: Colorado Centennial Ch. 100, Colorado West Timekeepers Ch. 138, Boulder Horological Society Ch. 160
Location: Boulder County Fairgrounds "Barn A," Longmont, CO

AUGUST 2024

AUGUST 2-3—EASTERN STATES*

Host: Central New York Ch. 55
Cohosts: Toronto Ch. 33, Western New York Ch. 13
Location: Utica University Nexus Center, Utica, NY
National Representative: Philip Morris

AUGUST 23-25—ALL TEXAS CHAPTERS*

Host: San Jacinto Ch. 139
Cohosts: Southwestern Ch. 15, Five State Collectors Ch. 80,

Lone Star Ch. 124

Location: Houston Marriott Westchase, Houston, TX

SEPTEMBER 2024

SEPTEMBER 14—MID-AMERICA*

Host: George E. Lee-Michiana Ch. 26
Cohost: Western Michigan Ch. 101
Location: Northern Indiana Event Center and Tru by Hilton, Elkhart, IN

SEPTEMBER 20-21—SOUTHERN*

Host: Creole Ch. 43
Cohost: Magnolia Ch. 41
Location: Copeland Tower and Comfort Inn & Suites, Metairie, LA

OCTOBER 2024

OCTOBER 11-12—NORTH COAST*

Host: Lake Erie Ch. 28
Cohost: Ohio Valley Ch. 10
Location: Best Western Plus, Strongsville, OH

NOVEMBER 2024

NOVEMBER 1-2—MID-EASTERN*

Host: Philadelphia Ch. 1
Cohosts: Keystone Ch. 158, Susquehanna Ch. 193
Location: York Expo Center and Wyndham Garden, York, PA

*Public day offered

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American Tallcase Clock by Daniel Dod of New Jersey, 91" high, circa 1810.



Lenzkirch highly ornamental Cartel Clock, 23" wide, circa 1880.



German Tallcase Clock playing musical tunes on 11" discs, 81" high, circa 1900.



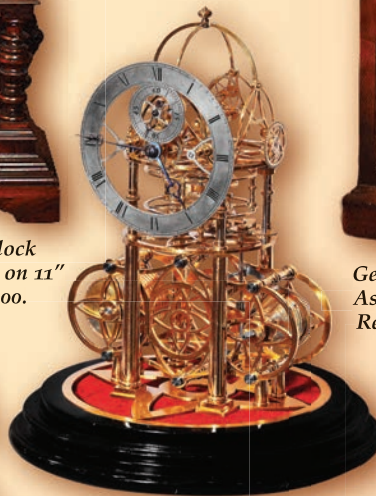
Austrian thirty-day 6-glass Vienna Regulator, 60" high, circa 1840.



George Jones Astrological Dial Jeweler's Regulator, 111" high, circa 1865.



High grade replica of the Lenzkirch Mermaid open well Wall Clock, 43" high.



One of a kind Italian Tourbillon Skeleton Clock, 17" high under glass dome.



French silk thread Mantel Clock, 13" high, circa 1835.



Rare French Allegorical Clock of Love conquering time, the time displayed in an aperture opening, 25" high, circa 1840.



Large Chinese Bracket Clock with mother of pearl, 25" high, circa 1840.



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