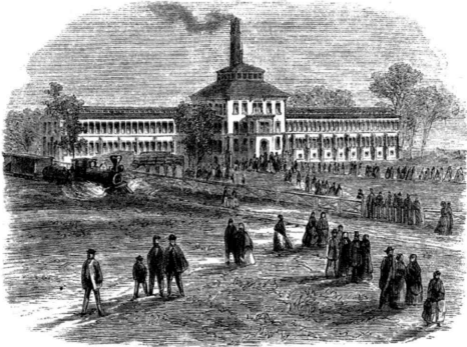


# Descriptions of American watch factories

The appendix to David Boles's article 'John Donegan's watch factory in Ireland' (*AH* December 2023) summarizes three 1850s descriptions of English watchmaking manufactories. Similar illustrated reports on American watchmaking firms and practices were published in popular American periodicals later in the nineteenth century.

One appeared in the July, 1869 issue of *Harper's New Monthly Magazine*, pp.169–182. Titled 'Making Watches by Machinery', the lengthy article began with the story of ancient timekeeping, European mechanical advances and the application of the pendulum, and described mass-production watchmaking in England and Switzerland. Then in 1852, 'A. L. Denison, a Boston watchmaker, conceived the plan of producing watches by collecting all these machines under one roof and running them by one power.' The reporter turned his



THE ELGIN WATCH FACTORY.

machines were very imperfect, and much of the work was still done by hand. But from that beginning have sprung all our watch factories, now situated respectively in Elgin, Illinois, Newark and Marlon, New Jersey, and Waltham, Roxbury, and Springfield, Massachusetts.

As we step aboard the Galena train at Chicago we observe the placard, "Pacific Express; does not Stop at Way Stations." We ponder behind the locomotive for forty miles; then the brakeman ends our reverie by shouting "Elgin."

Leaving the train, we gaze down upon a far-spreading little city, with court-house, academy, and churches upon commanding knolls, brick blocks and broad streets, cottages pleasantly shaded with oak, maple, and poplar, a woolen mill, a flouring mill, a butt-and-screw manufactory, and a milk-condensing establishment that ships its product to New York—all beside the bright river which cuts the town in twain, and is spanned by a gossamer iron bridge; and over the house-tops, a mile away, the tall chimney of the National Watch Factory.

In the spring of 1864 half a dozen active business men of Chicago, heard a fascinating description of the leading Massachusetts watch factory. To their willing ears it was a story with a moral, and this was the moral: "If Boston can make watches by machinery and largely supply the Northwest, Chicago can make watches by machinery and largely supply New England." It was the genuine, audacious, self-reliant Western spirit. Practi-

cal workmen assured them that with the investment of a hundred thousand dollars in buildings and machinery they could begin to turn out watches. They added fifty per cent. to this estimate for a margin, and with that blessed unconsciousness of the difficulties before them, without which no great enterprise would ever be undertaken, they organized the National Watch Company, and in November the work began.

After two years and a half spent in constructing the hundreds of intricate machines and erecting the buildings, in May, 1867, the first watch was completed. Not, however, until long after the first hundred and fifty thousand dollars was exhausted—that barely sufficed for a beginning. Before the enterprise was self-sustaining more than five hundred thousand dollars had been expended, and its owners and friends would



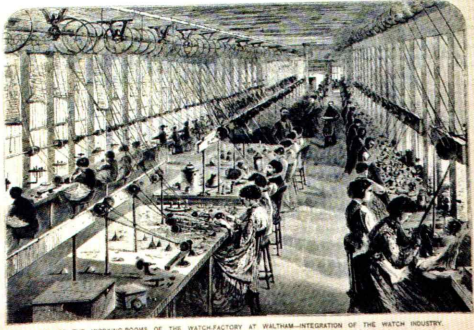
A WATCH FACTORY TWENTY YEARS AGO.



WE last week considered the watch historically, as a product of inventive thought, and saw that from that point of view it belongs to no single man, or nation, or generation, but that all the great thoughts of constructive genius, its development has occupied many minds for many generations of both, perhaps, than any

watch is the outcome of the accumulated skill of thousands of men for more than twice three long centuries; it is a compound of four centuries of advancing genius and art.

We have but one watch in existence, as there is but one St. Peter's, it would undoubtedly be regarded as the greatest wonder of man's



ONE OF THE WORKING-ROOMS OF THE WATCH-FACTORY AT WALTHAM—INTEGRATION OF THE WATCH INDUSTRY.

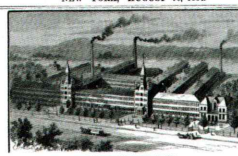
other of the great achievements of art. From the Marquis of Worcester's first forewinding of the steam engine to his completion by Watt and his little more than three centuries' Gallio's eye-glass developed into the forty-foot telescope of Sir William Herschel in one hundred and seventy years; the electric telegraph promulgated in the experiment of Watson and Franklin in 1742; and was patented by Morse in 1837; while the Cathedral of St. Peter from its foundation to the year 1352, took one hundred and seventy-five years. But the production, it would be said, "The concentration will of fifteen generations has produced from a few shreds of metal a pocket solar system, which repeats with perfect precision the rate of Nature's workings, and to which the human hand has not unduly contributed the order of his life."

But the watch is no rarity of the museum. Wonderful as it is, in genius and perseverance have conquered the possibility of its endless multiplication. Once the heavy of the rich only, it is now the



A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES. NEW YORK, AUGUST 16, 1884.

**THE AMERICAN WATCH WORKS.**  
 A watch is a machine. It used to be supposed that its delicate parts could only be made by manual skill, and by a large portion of the world this notion still prevails. The fact that a watch can be made by machinery, much of which is American, is a striking illustration of the application of the mechanical principle to a compound with human intelligence. A watch manufacturing concern was first organized in 1845 in company with Edward Howard and Samuel Clark, a small factory was started in 1848 at Waltham, Mass., which now occupies four acres later in Waltham, an other from Boston, a plant already famous for the first concern still started in this country. After occupying two successive locations, the present premises in Waltham



the ownership of the Waltham Watch Works is held in partnership. The factory itself is a brick building with numerous long wings, several towers, and having three separate entrances, besides an elegant suite of offices at one end and an observatory in the other. The total length of each building, nearly two miles of heavy shaft, a hot water and a steam shaft. There are 1,500 employees, 2,000 set of work rolls, 10,000 feet of metal working, and 10,000 feet of tubing, requiring work from 5 inches to 5 feet. All this machinery is driven by a Corliss engine of 250 horse power.

When Mr. Rollin had held of what the factory is capable of in modern manufacturing 1,500 watches had been made in all that were 1,200 watches have been made



AMERICAN WATCH WORKS, AS CONDUCTED AT WALTHAM, MASS.

full attention to his visit to the National Watch Factory in Elgin, Illinois, and took his readers through every department and process leading to hundreds of finished watches emerging every workday. Engraved views of the factory, its interior rooms, its machinery, and its men and women workers all enhanced the detailed text. An example: 'Hair-springs are made in the factory, of finest English steel, which comes upon spools like thread. To the naked eye it is as round as a hair, but under the microscope it becomes a flat steel ribbon...'

The following year, *Appleton's Journal of Literature, Science, and Art* in its July 9, 1870, issue pp. 30-36, focused upon the Waltham Watch Factory, established in Massachusetts years before Elgin. 'The Watch as a Growth of Industry' first described Swiss and English production, noting: 'English watches now have nearly all their parts made by the Swiss; and so disastrous has been the competition that it is declared, by high authorities in the London horological journal, that *three fourths of all the watchmakers' tools in England are now in paxen.*' Turning to the American factory system, the reporter asserted, 'American enterprise had made an industrial epoch, and beaten Europe in one of her oldest and

most difficult productions.' The reader again was treated to descriptions and illustrations of factory processes, engines, wheels, jewels, assembling, adjusting, dial firing, and more. The article closed on even higher notes, praising the riverside factory's cleanliness, airiness, and vistas, and asking, 'Does it not foreshadow that grand step which yet remains to be taken in the growth of the world's industry, the final harmony and complete integration of the interests of employer and employed?'

In 1884, the front page of the August 16 issue of *Scientific American* again targeted the American Watch Works in Waltham and led with, 'A watch is a machine. It used to be supposed that its delicate parts could only be made by manual skill; and in large portion of the world this notion still prevails. The idea that a machine can be made by machinery, much of which is automatic, is essentially American.' Continuing on pp. 102-104, this article also described and illustrated the factory's rooms, workers, and machinery. It reported, 'For certain kinds of work female operatives are preferred, on account of their

greater delicacy and rapidity of manipulation; and it should be added that women get the same wages as men for doing the same kind and amount of work.' The article's author, H.C. Hovey, reminded us, 'A volume would be needed to describe all the 3,746 operations required for the construction of an ordinary watch.' However, his summaries were informative and specific: 'The effect is striking of seeing so many objects of a kind massed together, e.g., 10,000 second hands in one jar – the result of one day's work in that line, the monthly order calling for 160,000. The counting is done by weight.'

In the April, 2004, issue of the *NAWCC Bulletin* pp. 161–174, Leslie Nesky took a retrospective look at articles in 1876 Waltham newspapers about the American Watch Company. This was the year of the American centennial when Waltham's exhibit at the World's Fair in Philadelphia amazed American visitors and alarmed those from Switzerland. The *Waltham Free Press* and *Waltham Sentinel* regularly reported factory news; the latter in its December 29th issue reprinted in its entirety the November 14th speech delivered by Edouard Favre-Perret in La Chaux-de-Fonds that alerted the Swiss watchmakers to the growing threat of American watch production. He stated: 'Had the Philadelphia Exhibition taken place five years later, we should have been totally annihilated without knowing whence or how we received the terrible blow. We have believed ourselves masters of the situation, when we really have been on a volcano.'

Bob Frishman

To view the full texts of the articles:

- *Harper's* is free via Hathi: <https://babel.hathitrust.org/cgi/pt?id=coo.31924080776903&seq=2>
- The *Appleton's Journal* article can be freely accessed at <https://quod.lib.umich.edu/cgi/t/text/text-idx?c=moajrnl&idno=cw8433.1-04.067>.
- The *NAWCC Bulletin* back issues can be read online but require Association membership.
- *Scientific American* requires a subscription to view archived articles.

## The Microcosm in America



**W**E, the Proprietors of the MICROCOSM, beg Leave to acquaint the Publick, that (as a far greater Number of Gentlemen and Ladies than could be expected in so short a Time, have obliged them with their Company) it will be shewn positively no longer than Friday, the 30th of this instant January; therefore it is hoped, the Few remaining, who may be desirous of seeing a Piece so much superior to any Thing of its Kind, and so well worthy the Notice of the most judicious, will be as expeditious as convenient.

Advert in the *Pennsylvania Gazette* of January 29, 1756, p. 4. Courtesy of Newspapers.com.

I enjoyed reading Anthony Turner's article 'Clockmaking and practical mathematics in the provinces of Britain and France, 1500–1800' in the December journal. I am familiar with Henry Bridges's *Microcosm*, which he discusses on p. 480, the remainders of which can be seen in the 'Collecting the World' gallery in the British Museum. During its tour of North America, the *Microcosm* was no doubt viewed by the subject of my forthcoming book, the eighteenth-century Philadelphia clockmaker Edward Duffield. I will mention it in my book along with an advertisement from the local press, which our readers may be interested to see.

Bob Frishman

Editor's note: In 'The Meandering Microcosm', published in *AH* Summer 1995, 160–161, John R. Millburn refers to his 20-page unpublished monograph *The meandering microcosm: a chronological account of the travels of this "matchless pile of art" in England, Scotland, Ireland and America 1733–1775*, of which he deposited copies in the AHS library in the Guildhall, the British Museum Horological Department and the Museum of the History of Science, Oxford. I have looked it up, and find that, in his discussion of the American leg of the tour, he mentions the advert in the *Pennsylvania Gazette*, as well as adverts and reports in the *New York Gazette*, the *New York Mercury* and the *Boston Gazette*, but does not reproduce any of these adverts.