"A Clock for the rooms": the Library Company's Horological Legacy

The scientific and horological holdings of the Library Company of Philadelphia would have been put to practical use by two of its prominent early shareholders, clockmakers David Rittenhouse (1732-1796) and Edward Duffield (1720-1801), each of whom was to have his work in the library. To their particular interest would have been any book by Dutch mathematician Christiaan Huygens (1629-1695) who, in 1656, laid claim to developing the first practical pendulum-regulated clock. The library owns several of Huygens's treatises in various editions. The first to be acquired, a duodecimo entitled *The Celestial Worlds Discovered*,[1] was listed by Benjamin Franklin (1706-1790) as being in the collection by 1741.[2] Plate I is an illustration from the library's copy of the 1673 edition of Huygens's *Horologium Oscillatorium*, which describes his invention and offers a mathematical analysis of pendular motion.[3]

In 1792, the number of scientific titles in the library substantially increased with the receipt of the nearly 4,000-volume Loganian Library, which included the private library of the polymath and book collector James Logan (1674-1751).[4] Among its rarities is a first edition of Isaac Newton (1642-1727), *Philosophiae Naturalis Principia Mathematica* (London, 1687), essential reading for Rittenhouse who also distinguished himself as a mathematician and astronomer.

Another shareholder involved with clocks was cabinetmaker Benjamin Randolph (1721-1791), whose trade card (Pl. II) depicts an elaborate rococo case for a tall clock.[5] His designs appear to have been influenced by English design books.[6] The third edition of Thomas Chippendale's *The Gentleman and Cabinet-Maker's Director*, which contains designs for clock cases, was inventoried in the library's 1770-1835 printed catalogues and thus would have been available to Randolph and other shareholders making furniture, such as James Gillingham, William Savery, and Joseph Trotter.[7]

The greatest enhancement to the horological collections came during the tenure of Edwin Wolf 2nd (1911-1991), who became curator in 1953 and served as librarian from 1955 to 1984. Among his judicious purchases was *Horological Dialogues* (London, 1675) by John Smith (w.c. 1673-1680) (Pl. III), bought in 1956. This is the first English book on clocks and watches and is now virtually unobtainable. Its description of how a pendulum works[8] is contemporaneous with the manufacture of the library's John Fromanteel clock (Pls. VI and VIa), which incorporates that innovation.

Another of Wolf's acquisitions, in 1961, was *The Artificial Clock=Maker* (London, 1696) by William Derham (1657-1735) (Pl. IV), which came out at about the time that the library's William Martin clock (Pls. XII and XIIa) was made. It explains, among other things, Huygens's defense of his claim as the inventer of the pendulum clock against others who may have theorized but not perfected it, such as Galileo Galilei (1564-1642).[9] In the 1970's, in a singular act of skullduggery, one reader attempted to abscond with this

first edition by substituting a later one in its slipcase. A sharp-eyed librarian, discovering the ruse, was sufficiently fleet of foot to apprehend the reprobate on the sidewalk![10]

Among the most important horological acquisitions was the donation of the remarkable European scientific collection of shareholder Penrose R. Hoopes (1892-1976), given by his daughter in 1976. Hoopes, a successful mechanical engineer and pioneer collector of scientific books, was also an authority on clocks. Here is how Wolf described the collection, much of it profusely illustrated: "It is one of the most important and valuable collections received by us in this century. To the cogniscenti the titles alone are the hallmarks of quality; to the merely inquisitive they are doors to the wonderland of the ingenious machines and ideas of long-dead inventors."[11]

Included were 37 horological works printed between 1578 and 1840. The earliest of these, Cunradus Dasypodius [Konrad Hasenfratz (1531-1601)], *Warhafftige Ausstellung des Astronomischen Uhrwercks zu Strassburg* (Strassburg, 1578), depicts (Pl. V) and describes the famous clock with moving figures in Strassburg Cathedral.[12]

Another title was *The Principles of Mr. Harrison's Time-Keeper* (London, 1767), whose author, John Harrison (1693-1776), won the Board of Longitude's prize for the invention of a chronometer to determine longtitude at sea, thereby saving the British fleet from further disasters such as that which befell it off the Scilly Islands in 1707.[13]

One rarity, which shows the diversity of the Hoopes collection, is James Cox, *A Descriptive Catalogue of the Several Superb and Magnificent Pieces of Mechanism and Jewellry*

(London, 1772). It contains descriptions of 23 examples of elaborate mechanical pieces fashioned by the work shop of this fashionable eighteenth century London jeweler.[14] These wind-up masterpieces, many of them incorporating clocks and musical chimes, remain perennial crowd-pleasers when they appear for sale at London's Grosvenor House Art & Antiques Fair.

During the tenure of the present director, John C. Van Horne, which began in 1985, the library received scientific gifts, some relating to horology, from Anthony N. B. Garvan (1917-1992), a board member from 1956 and president from 1986 until his death. These included, in 1988, 101 early modern precision instruments (such as slide rules, dividers, balances, scales, and a hand-held calculating machine known as "Napier's bones") and 23 books on how to use them.[15] In 1990, Garvan supplemented these with two more books. One of these would have special appeal to non-numerate horologists wishing to make outdoor use of the sorts of instruments donated by Garvan: Edward Wright's *A Short Treatise of Dialling: Shewing, the Making of All Sorts of Sun-Dials…with Ruler and Compasses Only, Without Any Arithmeticall Calculation* (London, 1614). This volume complements another work in the library's collection: James Logan's copy of the 1657 edition of Wright's *Certain Errors in Navigation*, first published in 1599, which contains tables and formulae for measuring longitude at sea, a precursor to the John Harrison volume in the Hoopes donation.[16]

The major horological acquisition of the Van Horne era thus far is the tall-case clock by Edward Duffield (Pls. XVI, XVIa, XVIb) donated in 2003. It is described below and in the *Annual Report* for that year.[17]

Nothing is known of the Library Company's first timepiece. Its chime could not have been ear-piercing given the board's instruction to the librarian that "if any Person hath to be awakened Twice, he shall be requested to leave."[18]

The whereabouts of other clocks previously in the library is also a mystery. In at least one instance, the loss appears inconsequential. No one has come to inquire about the cuckoo clock photographed in the Women's Reading Room of the former library building at Juniper & Locust Streets. It had been hung next to a portrait of the founder, Benjamin Franklin, who no doubt would have appreciated the unintended humor of that juxtaposition.[19]

Fortunately, the five clocks in the library's collection that have survived, all of them tall-case examples, are worthy of discussion. Each resonates with the history of horology, the library, and Philadelphia. In order of acquisition, here are their stories.

The "Cromwell Family Clock" by John Fromanteel of London, c. 1673

One of the library's great rarities (Pls. VI and VIa) is a brass dial, tall-case clock, c.1673, by John Fromanteel (c.1638-c.1682), a pioneer of pendulum clockmaking in England.[20] Its donation by William Hudson was recorded in 1796: "A Clock (with its case)

made by Johannes Fromenteel [sic], in London, about the year 1660, once owned by the family of Oliver Cromwell."[21] In 1807, one writer noted its being "used as the time-piece of the library, and is in good repair."[22]

Hudson had inherited the tall-case clock in 1793, on the death of his father, Samuel Hudson, a library shareholder since 1765. The clock had been acquired at an English auction by the donor's great-great-grandfather, William Hudson (d.1713), a Yorkshire tanner. The first record of its being in Philadelphia is at the home of the latter's prosperous son, William Hudson (1664-1742), also a tanner and the city's mayor in 1725 and 1726.[23]

John Fromanteel played a pivotal role in transmitting to England a major horological breakthrough of the mid-seventeenth century: applying a pendulum to the escapement of clocks to improve their accuracy.[24] The near friction-less swing of the pendulum meant that the new clocks could keep time within seconds a day, a marked improvement over their predecessors. This would prove a boon to science, where precise timekeeping was critical.

John Fromanteel had learned the technology in The Hague in 1657-1658, from Salomon Coster (c.1620-1659), who had been granted a patent in the United Provinces (the Netherlands), in June 1657, for making pendulum clocks. According to their surviving notarized contract, dated September 3, 1657, Fromanteel, as "master-servant clockmaker," agreed to make the new clocks with Coster, as "master-clockmaker," from

that date until May 1, 1658.[25] Coster had been working with Huygens since 1656, helping him apply his invention of the pendulum clock.

John Fromanteel returned to England and shared what he had learned with London clockmaker Ahasuerus Fromanteel (1607-1693), thought to be his father. Wasting no time in capitalizing on this technical innovation, Ahaseurus advertised, on October 27, 1658, that he could offer the public "clocks that go exact and keep equaller time than any now made without this regulator (examined and proved before his Highness the Lord Protector by such Doctors whose knowledge and learning is without exception)…."[26] Ahaseurus had previously gained the attention of this powerful patron. In 1656, he had been granted the freedom of the City of London on Oliver Cromwell's (1599-1658) personal letter of recommendation, an unusual privilege.[27]

Given those close associations, Cromwell's *family* could have owned a clock made by John Fromanteel, as recorded in the library's minutes. But, over time, the romantic belief developed that the Lord Protector had owned the clock himself. This was fueled by the publication, in 1847, of a nine-verse poem, the "Cromwell Clock," which opened with the salutation:

Hail to thee, reverend chronicler, that on thy gloomy pages

Hast written, with unfaltering hand, the hours and days of ages;

Though centuries have carved their mark upon thine ancient brow,

Yet firmly, as in days of old, thy pulse is beating now….[28]

Even some modern writers came to accept the spurious notion that the library's John Fromanteel clock had been Cromwell's personal property.[29] That cannot be true. Oliver Cromwell died on September 3, 1658, well before John gained his freedom as a clockmaker, in 1663, permitting him to affix his name to his work. Moreover, both the clock and its case date to the early 1670s.

The works incorporate a refinement introduced after about 1670: an anchor, long pendulum escapement. The anchor permitted the use of a long pendulum with a small arc, which was found more precise than the short pendulum verge escapements previously employed.[30] More specifically, the library's clock has the early anchor-recoil escapement typical of the Fromanteel workshop in the early 1670s, with the pallets covering a small number of teeth of the small diameter escape wheel. By the late 1670s, the count wheel, which regulated the strike mechanism, was first moved by some makers from outside, on the back plate, to inside the movement – becoming known as an "internal count wheel." The interesting point of the movement in the library's clock is that the great wheel and count wheel are at the front of the barrel, rather than at the back of the movement. This may have been to economize space within the movement.

The nine-inch square brass face [Pl. VIa] of the library's clock has restrained decoration befitting its purportedly Puritan provenance. It has no spandrels and is discreetly engraved in small script below its clock dial: "Johannes Fromanteel Londini fecit." Remnants of what may be its original silvering remain on the eight-inch diameter

chapter ring. The matted surface of the center of the dial contrasts with, and makes more legible, the engraved blackened markings on the chapter ring's smooth, silvered surface: Roman numerals for the hours, small trefoils between them for the half-hours, and minute divisions on the outer edge with every fifth minute denoted in Arabic numerals. The hour hand is of spade design. A square aperture at the bottom of the matted area displays the day of the month.

On the back of the dial is a shaped lever for the bolt and shutter maintaining power, which is a design seen on many Fromanteel clocks and is virtually unique to the Fromanteels. This lever controls the shutter mechanism which covers the winding holes of the dial and moves aside to wind the clock. The clock runs for eight days on one winding.

The case, which is original to the clock, is of burl walnut veneer over oak. Its dimensions are: height 79, width 15 ¾, depth 9 ¼ inches. The hood lifts off to allow winding. In the front corners of the hood, ebonized Baroque, twist-turned, full columns taper towards the top, as do similar quarter columns in the rear. The glass side lights of the hood are of the same height as its front pane. Above, the broken arch pediment with floral rosettes and flowing acanthus leaf carving under scrolls is centered by a paneled plinth. The plinth has a hole on top, evidence of a now missing finial, which probably was in the shape of a ball. The waist door is surrounded by a simple half-round molding. There is bolection molding above the door, supporting the platform for the hood and

another bolection above the base. The door has its original engraved brass escutcheon. Securing the door to the case are its original pierced iron strap hinges. The lock is replaced. The case is supported on four ball feet, one now missing and one possibly replaced.

The case of the library's Fromanteel clock may be confidently dated to about 1673, as it is virtually identical to a pair of clockcases supplied that year to the University of St Andrews with works by clockmaker Joseph Knibb (1640-1711), then working in London.[31] The latter are the first documented English tall-cases to have flush-veneered cases, half-rounded edge moldings on their waist doors, and twist-turned pillars in their hoods, all of which features made their first appearance on English case furniture in the early 1670s.[32]

Today, the Fromanteel clock stands in the library's William H. Scheide Reading Room to the left of the entry to the office of the librarian.

The "astronomical clock" by John Child of Philadelphia, 1835

On January 6, 1831, the only fire in the library's history occurred in the library's building on Fifth Street (Pl. VII) in the section known as the "Loganian Library." Destroyed in the flames were various books and artifacts, including a "Clock valued at $200." Descriptions of this clock are sparse. The minutes record it as having a case supported by a "wooden column…[that] had been for many years enclosed in brick

work…."[33] Earlier minutes, in 1796-1797, refer only to the repair of "the Clock," the finishing of its case, and its being "fixed up in the room of the Loganian Library."[34]

A contemporary observer, in 1804, had described it as "a curious clock, invented by the late Doctor David Rittenhouse, which gives notice, by ringing an alarm every evening at the setting of the sun, and winds itself up at the same time."[35] Sunset was the closing time of the library. This was a clock befitting Rittenhouse's (Pl. VIII) combination of talents as a clockmaker, mathematician, and astronomer.

After the fire, a "committee of repairs & improvements" was appointed and proposals for the erection of a replacement clock were received.[36] The proposal from clockmaker Isaac Lukens sought $300 and "was ordered to lie on the table untill the next meeting."[37] And lie on the table it did, as nothing more of it ever again appears in the minutes.[38]

Another proposal came from Lukens's equally well-established competitor: "A letter was received from John Child offering to sell to this institution a clock with an alarm to ring at sundown, which was referred to the committee of repairs and improvements with power to take order on the subject."[39] John Child (1789-1876) was also well known to the committee having been a shareholder since 1826.[40]

At the meeting of June 4, 1835: "Mr. Norris from the committee on repairs and improvements reported that they had purchased the astronomical clock offered for sale to this institution by John Child for which they agreed to give one hundred twenty five

dollars."[41] The clock was presumably installed by October 3, 1835, as it was then recorded that such amount in cash was paid to "John Child for a Clock for the rooms."[42] The Child astronomical clock is shown in Plates IX, IXa, and IXb.

The firm, which Child founded in 1810, made clocks until his demise in 1876, and continued to sell clocks until 1941.[43] By that time, it was the nation's oldest family-owned horological establishment, following in the tradition of Philadelphia's earlier clockmaking dynasties, the Stretches and John Wood, Sr. and Jr.

By 1845, the craft of hand-making hall clocks was threatened by machine-made clocks, which were far cheaper to produce. To meet this competitive threat, John Child's sons, Samuel T. and Thomas T., who had by that time joined his concern, proposed to add jewelry to the business. John Child, a devout Quaker, who preferred plainness to profit, chose to leave his business to his sons, rather than engage in that line of commerce. The firm became "S. & T. Child" with the founder continuing to make clocks by hand in his retirement.[44]

The painted dial [Pl. IXa] of the library's Child clock is nearly two feet in diameter. It reads "John Child,/Philad[a]," and has figures from 4:30 to 7:30 along its lower edge [Pl. IXb] for varying the sunset closing of the library which it could once perform. Edward LaFond, who restored the clock in 1968, described it as "exceptionally well made" with a "[d]ead-beat escapement which was primarily designed for extremely accurate clocks such as this was meant to be." He also noted that "[t]he lead pendulum

bob weighs over 15 pounds, another attempt to assure accuracy." LaFond further observed that the movement had been originally fitted with a "complicated mechanism that rang at sunset" and that "[u]nfortunately, some later clock repairer completely removed this mechanism."[45]

Eckhardt, another expert, had his own words of admiration for this fine example of Child's work: "So this clock struck the closing hour with the regularity of the sun itself." Eckhardt was less generous in his remarks towards the painted pine case of the Child clock, which he described as "ponderous in the extreme."[46] The dimensions of this clock's very tall case are: height 92, width 44, depth 12 inches. Accentuating its boxiness are rectangular pillars on either side of the hood and waist. The mass is somewhat relieved by decorative grain-painting and an eight-paned glazed door, permitting a view of the pendulum.[47] The clock appears in the far niche of the Loganian Library in Library Hall on Fifth Street in an 1879 watercolor by Colin Campbell Cooper Jr. (1856-1937) [Pl. X].

John Child's account book [Pls. XI and XIa], remains in the hands of his descendants, who graciously permitted the author to review it for any entry corresponding to those in the minutes of the library regarding the purchase of the clock. Unfortunately, the account book did not cover that period. But a remarkable discovery arose from that research: Child had debited the account of clockmaker Thomas Voight, on "5 Mo[nth] 31 1816," the sum of $55.00, "To an eight day clock pin scapment [sic] in

the back maintaining power and circular dial two feet in diameter for the Senate Hall Washington" [Pl. XIa].[48]

Was the clock still at the U.S. Senate? Its staff confirmed that it was. Originally made for the Old Senate Chamber, it now stands outside the present one. It "no doubt was purchased to replace a clock lost during the burning of the Capitol by the British."[49] However, the origins of the Senate's clock had been obscured: As Voight's name appears on its face, and the clock had been ordered from him, in 1815, and delivered by him, in 1817, he had been thought its maker.[50] But, an examination of the works corroborates the entry in the Child account book as to its true authorship: The movement plate and dial post support bridge are each stamped "J. Child/Phila."[51]

As the Library Company served as the first library of Congress during Congress's ten-year residence in Philadelphia, it is serendipitous that both institutions should replace burned timepieces with clocks by the same maker. By way of further coincidence, the library's Child clock stands today in the office of its director, beneath Giuseppe Ceracchi's (1751-1801) bust of *Minerva as the Patroness of American Liberty*, 1791, which the sculptor had presented to Congress.

The "William Penn Clock" by William Martin of Bristol, c. 1685-1700

The library's other English tall-case pendulum clock is by Bristol maker William Martin, and dates from c. 1685-1700. Known as the "William Penn Clock," it is shown in Plates XII and XIIa.

Little is known of Martin and documentary references to him are sparse. The Bristol Record Office has no record of his apprenticeship or his becoming a freeman. Secondary sources have him working from as early as 1695 to 1739,[52] but Martin was apparently at his bench well before then, according to a marriage license bond: "29 May 1689 William Martin, Bristol, *clockmaker*, and Ann Loosley, Castle Precincts: Bondsman John Sutton, Bristol, clerk."[53]

The "William Penn Clock" is typical of well-made, brass square dial English tall-case clocks of the last decade of the seventeenth century. It has a count wheel locking plate strike mechanism.The unusual feature is its 30-day duration on a single winding. The base of the 10 ½-inch diameter chapter ring [Pl. XIIa] is signed "Will- Martin Bristol fecit." The dial has Roman numerals to mark the hours, trefoils in between for the half hours, and minute divisions on the outer edge with Arabic numerals marking every fifth minute. A separate subsidiary ring below the "XII" has divisions for seconds on its inner edge with Arabic numerals for every fifth second. There are two winding holes, in between which is a calendar framed in an engraved window under three engraved crowns,

each surmounted by five balls. The brass spandrels depict winged cherubs and a leaf-and-flower motif.

The flat–top hood has rectangular side lights and lifts off. Ebonized, twist-turned columns at its front corners taper as they rise. Bolection molding is at the top and bottom of the case waist. The glass bulls-eye pane in the waist door allows viewing of the pendulum. It is secured within the oculus by putty with no evidence of its ever having a molding to retain it. The case is walnut veneered over oak and has these dimensions: height 82 ¼, width 19 ¼, and depth 10 ½ inches. The veneer on the front has been divided into panelled fields by string inlay, probably of holly. The veneer on the sides of the waist is book-matched. The base has been grain-painted, probably in the 19th century, in emulation of veneer now missing. Crude bracket feet have been added to the base molding, probably in the 19th or early 20th century.[54]

The clock had been on loan to the library since 1857 from William Warder (1821-1886), a St. Louis lawyer. It was donated by his daughter, Sally Price Warder (d.1936), who resided in Philadelphia. Known as "Dolly," she was quoted as saying that "I got tired of seeing a card 'Lent by William Warder' and had a brass plate put on it as a gift."[55] The plate reads: "Clock owned by William Penn/ Presented by William Warder/ - November 1857." The clock is shown in Plate XIII against the side of a bookcase in an 1879 Cooper drawing of the interior of Library Hall on Fifth Street.

By family tradition, William Warder had inherited the clock from his Quaker forebears. They had emigrated with Penn on his second voyage to Philadelphia, in 1699, aboard the ship *Canterbury*.[56] The clock had purportedly once stood in Pennsbury Manor, the country seat built by Penn on the Delaware River in Bucks County some 25 miles north of Philadelphia, completed in 1686.[57] One authority was more specific, stating that the library's clock had "marked the time in the great hall at Pennsbury."[58]

Dolly Warder did not know how her family came to own the clock, nor does Penn's Cash Book or other extant documentation record any dispersal of a Penn-owned clock to the Warders. But antiquarian John Fanning Watson does describe the Warder clock as one of two with purported provenances to Penn:

> Penn's clock was not long since in the hands of Martin Sommers, near Frankford, who got it from Mr. Peter Harewaggen, an aged person who lived near Pennsbury. The clock was formed of an oaken case, curiously wrought and inlaid with bone. There is another clock of Penn's said to be such, now in the Warder family of Philadelphia.[59]

The Warders had various associations with Penn, apart from their sea voyage. William Warder's great-great-great grandfather, Willoughby Warder Sr., owned considerable land in Bucks County, near to Pennsbury.[60] Several entries in Penn's Cash Book show transactions, as early as 1700, with Solomon Warder, Willoughby's son.[61]

Willoughby's will made provision for his "friend John Sotcher."[62] Sotcher (d. 1729), and his wife Mary, had been stewards at Pennsbury.[63] It is conceivable that the Warders got the clock from the Sotchers who had received other furniture from the Penns.[64]

Penn appears to have owned at least one pendulum clock while in Pennsylvania. The *Account taken of all goods at Pennsbury,* on December 2, 1687, after the death of Penn's prior steward, James Harrison (c.1628-1687), lists "1 brass Clock" and "2 pece of Clock Line" as being "In the Pasaige Roume." This may describe a pendulum clock, as the line could have been used to secure the two weights driving it. As no other description of such a clock is given in this inventory, it is impossible to determine whether these entries refer to the library's tall-case clock. While the library's walnut veneer on oak clockcase is of like woods to other furniture listed in the same room as Pennsbury's brass clock, "3 black walnut Chayres" and "4 ocke Chayres," such woods were common in that era and, as such, can offer no independent corroboration.[65]

A second inventory of Pennsbury, entitled *A Catalogue of Goods left at Pensbury, the 3d of ye Tenth Month, 1701, i.e.* December 3, 1701, is even less specific. Among the "Lower Roomes," it lists no clock in the "best Parlour," and "1 clock" in "The other Parlour."[66] A third inventory, taken a month prior at Penn's Philadelphia residence, i.e. not his country seat Pennsbury, lists "1 clock" in the Parlour.[67]

While entries in Penn's Cash Book describe transactions involving clocks, most pertain to repairs and none identify William Martin. (As the clock was imported from

England, there would be no reason to expect reference to Martin in an account book maintained in Pennsylvania.) For example, under date of the 2nd of the third month 1700, there is a credit, "By David Vaughan for Clock & Watchwork," in the amount of £1/12/0.[68] On the 17th day of the sixth month 1700, there is a credit "By Jno Farmer for mending ye Old Clock, "at £0/19/0.[69] The latter entry would appear not to pertain to the library's clock, as it is unlikely to have been considered "old" as of that date.

Clockmakers were still scarce in Philadelphia by the time of Penn's second voyage in 1699. It comes as no surprise therefore that Penn would have imported a well-made tall-case clock from his homeland, especially one that could be run for a month on a single winding. Bristol would have been a natural choice for such an order, as Penn had many ties to it. The birthplace of his father, Bristol was also the home of Penn's second wife, Hannah Callowhill. Given its approximate date, the clock could very well have been commissioned from Martin as a wedding present. Penn had announced their intention to marry before the Bristol Men's Monthly Meeting, on November 11 and 25, 1695. The marriage took place on March 5, 1696.

If the clock didn't accompany Penn on his 1699 voyage with the Warders, it could have come over on any one of a number of ships bringing cargo to Pennsylvania from Bristol. In one of his contemporary letters to his secretary, James Logan, Penn asked that two Bristol ship captains be entertained. [70]

In any event, no one has ever disputed the tradition of Penn-ownership. In 1864, at the Great Central Fair, in Philadelphia, "William Penn's clock" was hailed as one of the "most unique and precious collection of Penn relics" displayed in the "Wm. Penn Parlor."[71] A brochure describing the contents of the Penn Parlor, confirms that the clock displayed there was on loan from the library. That brochure and other Fair ephemera may be found in the library's collections.[72]

Clock by Christopher Sauer of Philadelphia, c. 1735

A brass dial tall-case clock by Christopher Sauer (1693-1758) is the library's earliest American-made clock. It is shown in Plates XIV and XIVa. The clock accompanied the 1904 bequest of Sauer's lineal descendant, Charles G. Sower, of a "very valuable collection of books," the greater part of which were "Sauer imprints," that is books printed in Germantown by members of the Sauer family between 1743-1778.[73]

Sauer (variously Saur, Souer, Sower) was born in Wittgenstein, Westphalia and immigrated to Philadelphia in 1724, where he settled first in Germantown. He then spent several years mixing herbs in Lancaster County, where his wife became active in the German religious community at Ephrata. Returning to Germantown, he built a house there in 1731 and set up a printing press in 1738. The Ephrata community was among his earliest patrons, his first major book being a collection of their German-American hymns. Sauer's publication, in 1743, of Luther's German translation of the Bible became a

landmark in American publishing as the first Bible published in a European language in America (Pl. XV).

Sauer's inventiveness knew few bounds. He was even casting his own type and selling it to other printers. His type won praise from his competitor, *The Pennsylvania Gazette:*

> As Printing Types are now made to a considerable degree of perfection by an ingenious Artist in Germantown; it is recommended to the Printers to use such Types, in preference to any which may be hereafter imported.[74]

While best-known as a printer, Sauer was equally adept as a clockmaker, joiner, mechanic, oculist, apothecary, herbalist and doctor. His formal training had included the study of medicine at Marburg prior to his emigration.[75] His clockmaking dates at least as early as 1726, as a bond dated December 30 of that year identifies him as "Christopher Sower of ye sd. [Philadelphia] County, Clock Maker."[76]

The Sauer clock is the earliest of the library's American-made clocks, dating to c.1735. A brass square dial, eight-day pendulum clock, its 10 5/8-inch diameter chapter ring has Roman numerals for the hours and, in between, trefoils to mark the half hours (Pl. XIVa). There are also four half-shaded diamond motifs engraved on dial. The bottom of the dial is engraved "Christophor Souers." Below the "XII" is an aperture showing the moon's phases, a so-called "penny-moon window." Another aperture, above the "VI,"

displays the date of the month. Its brass spandrels, which may be replacements, are in the same style as those on the Martin clock with winged cherubs and a leaf-and-flower motif. The clock hood has a door which opens to permit winding via two winding holes. As Sauer was also a joiner, he may have made its simple mahoganized pine tall case, which measures: height 80, width 18 ¼, depth 11 ½ inches.

Edward LaFond, who repaired the Sauer clock in 1968, reported its construction and condition: "Unusually constructed eight day movement. Originally the clockmaker included a pull repeater quarter hour striking mechanism which, when tripped, struck the hour to the nearest quarter. Unfortunately, some later clock repairer removed this apparatus."[77] Its eight-day works run on an anchor-recoil escapement.[78] The lantern pinions on the wheel trains evidence training in German clockmaking traditions,[79] which Sauer is thought to have acquired from his Germantown contemporary, Christopher Witt (1675-1765), one of Philadelphia's earliest clockmakers.[80]

The Sauer clock was last publicly exhibited outside the library in April 2000, as part of the "It's About Time" loan exhibit at the Philadelphia Antiques Show. Today it stands inside the entry to the print and photograph department.

Clock by Edward Duffield of Philadelphia, c. 1760

A statuesque addition to the colonial furnishings of the Logan Room is an over eight-foot, walnut clockcase, housing brass dial works by Philadelphia clockmaker Edward Duffield (Pls. XVI and XVIa). Dating from about 1760, the clock was made during the so-called "Golden Age" of Philadelphia clockmaking, which ran from mid-century until the Revolution.

Described by John Fanning Watson as a "very intelligent reading man," Duffield no doubt made ample use of Library Company resources.[81] One of the city's most respected citizens, Duffield was an original member of the American Philosophical Society and a delegate to the first General Convention of the Protestant Episcopal Church, held in 1785.[82]

Duffield's shop was at the northwest corner of Second and Arch Streets. The story is recounted by Watson that Duffield "used to be so annoyed by frequent applications of passing persons to inquire the time of day – for in early days the gentry only carried watches – that he hit upon the expedient of making a clock with a double face, so as to show north and south at once; and projecting this out from the second story, it became the first standard of the town."[83]

As a testament to his prominence, in 1762, Duffield was appointed successor to Thomas Stretch (d. 1765) as keeper of the clock at the Pennsylvania statehouse (later known as Independence Hall). Duffield held that post until 1775, when he resigned to

devote greater attention to Benfield, his ancestral estate in Moreland Township, and was succeeded by David Rittenhouse.[84]

Duffield was also a member of the American Philosophical Society, for whom he constructed, in just three weeks, "an ingenious contrivance:" an astronomical clock with which to chart the transit of Mercury in 1769.[85]

A close friend of Benjamin Franklin, Duffield sheltered Franklin's family at Benfield during the British occupation of Philadelphia. In 1779, Sarah Franklin Bache wrote to her father in Paris of Mrs. Duffield's kindness, concluding that: "I think myself lucky to have had such a friend." Franklin so esteemed his friendship with Duffield that he appointed him one of the executors of his estate.[86]

The library's Duffield clock is in a typical walnut Philadelphia, so-called "Queen Anne- style" case, supported on straight bracket feet with a small drop centered between the feet. Its "sarcophagus top" is surmounted by three plinths with ball and spire finials. To set off the vibrant, swirling grain of the crotch walnut in the waist door, the rest of the case has more straight grain. The front base panel also has fancy wood. The case measurements are: height 99, width 23, depth 12 ¼ inches.

The clock has an arched dial (Pl. XVIa) and an eight-day time and strike movement with two trains: a strike train on the left and a time train on the right. The time train activates the strike train to strike the hour on a bell. All of these features are common to English and American movements for tall-case clocks of the eighteenth

century. The silvered boss in the arch (Pl. XVIb) is floridly engraved "Edward Duffield / Philadelphia" in a style peculiar to Duffield, and was thus perhaps by him.[87] At about the same time as he was making this clock, Duffield engraved the dies for first Indian peace medal in America, stuck in 1757 his fellow library shareholder, Joseph Richardson Sr., Philadelphia's preeminent silversmith. One of those medals, now extremely scarce, is owned by the library (Pls. XVII and XVIIa).[88] It is currently on view in the traveling Franklin tercentenary exhibition, "In Search of a Better World," http://www.benfranklin300.org/, of which the library is one of the principal sponsoring institutions.

The Duffield clock was the munificent gift, in 2003, of Pamela Mones and her husband, Richard Alan Mones, M.D., a library shareholder who owns the share formerly held by Edward Duffield.[89] The Library Company is indeed fortunate to have received something which, to borrow a phrase, is "so redolent of age and authority"[90] and of associations with its distinguished shareholders and founder.

The author thanks the following for their courtesies regarding this article: Alan Andersen, Adam Bowett, Mr. & Mrs. John Child Sr., John Child Jr., Esquire, Mary Maples Dunn, John Hooper, Michael and Alyson Marsden, Clint McCauley Jr., Dr. Richard Alan Mones, Karen Paul and her colleagues at the U.S. Senate, Sir George White Bt., and, not least, the Library Company staff.

Jay Robert Stiefel is a lawyer and decorative arts historian. He holds the Library Company share once issued to the Philadelphia joiner William Savery (1721/22-1787).

Endnotes:

[1] Christiaan Huygens, *The Celestial Worlds Discovered* (London, 1722, 2nd ed., corrected & enlarged). It was originally published in 1698, in separate English and Latin editions.

[2] Benjamin Franklin, *A Catalogue of Books belonging to the Library Company of Philadelphia* (Philadelphia, 1741).

[3] Christiaan Huygens, *Horologium Oscillatorium Sive De Motu Pendulorum Ad Horologia Aptato Demonstrationes Geometricae* (Paris, 1673).

[4] Logan had arrived in Pennsylvania as Penn's secretary in 1699. He afterwards held several prominent public positions and amassed great wealth as a merchant. His private library numbering over 2,600 volumes was left, at his death, to the public benefit. In 1792, the Loganian Library, then nearly 4,000 volumes, was transferred by act of the General Assembly to the custody of the Library Company of Philadelphia ["LCP"] and housed in the east wing of its building on Fifth Street south of Chestnut, which had opened the prior year. *"At the Instance of Benjamin Franklin," A Brief History of the Library Company of Philadelphia* (LCP, Philadelphia, 1995), pp. 31-36.

[5] James Smither, *Benjn. Randolph, Cabinet Maker, at the Golden Eagle in Chestnut Street Between third and fourth Streets, Philadelphia,"* engraving, Philadelphia: I. Smither Sculpt, [1769]. This sole surviving example of Randolph's trade card, printed from a copperplate engraving, is preserved in the print and photograph department of LCP. For more on Smither (1741-1797, see Harrold E. Gillingham, "Old Business Cards of Philadelphia," *Pennsylvania Magazine of History and Biography,* vol. 53 (Philadelphia: The Historical Society of Pennsylvania ["HSP"], 1929), pp. 203-229, at p. 206.

[6] For possible inspiration for the furniture designs depicted in the Randolph trade card, see Fiske Kimball, "The Sources of the Philadelphia Chippendale: Pt. 2-Benjamin Randolph's Trade Card," *Pennsylvania Museum Bulletin,* vol. 23 (October, 1927), pp. 5-8.

[7] Thomas Chippendale, *The Gentleman and Cabinet-Maker's Director*…(London, third ed., 1762), pl. CLXIII; Edwin Wolf 2nd and Marie Elena Korey, eds., *Quarter of a Millenium, The Library Company of Philadelphia, 1731-1981* (LCP, Philadelphia: 1981), p. 29.

[8] John Smith, *Horological Dialogues In Three Parts Shewing The Nature, Use, and right Managing of CLOCKS and WATCHES with an APPENDIX (London, 1675)*, pp. 8-11.

[9] William Derham, *The Artificial Clock=Maker, A Treatise of Watch, and Clock-work: Wherein the Art of Calculating Numbers For most sorts of MOVEMENTS Is explained to the capacity of the Unlearned. Also the History of Clock-work, Both Ancient and Modern* (London, 1696), p. 95.

[10] The author wishes to thank James N. Green, the present librarian, for sharing this bit of library lore which was recounted to him by a predecessor.

[11] "Report of the Librarian," *The Annual Report of the Library Company of Philadelphia for the Year 1976* (LCP, Philadelphia, 1977), p. 10.

[12] Ibid., pp. 14-21.

[13] Ibid.

[14] Ibid.

[15] "Report of the Librarian," *The Annual Report of the Library Company of Philadelphia for the Year 1988* (LCP, Philadelphia, 1989), pp. 14-17. Garvan had used the instruments as teaching aids in his courses in the American Civilization Department which he helped found at the University of Pennsylvania.

[16] "Report of the Librarian," *The Annual Report of the Library Company of Philadelphia for the Year 1990* (LCP, Philadelphia, 1991), pp. 13-14. The second work Garvan gave in 1990 is an even greater rarity. The report describes it as "the first practical book in English regarding seamanship and nautical technology:" *The Sea-Mans Grammar and Dictionary* by Captain John Smith (1580-1631), published in London in 1626. Better yet, it bears the shelf mark of Isaac Newton! Ibid., p. 14.

[17] "Gifts," *The Annual Report of the Library Company of Philadelphia for the Year 2003* (LCP, Philadelphia, 2004), pp. 34-35.

[18] Austin K. Gray, *Benjamin Franklin's Library* (The Macmillan Company, New York, 1936), p. 12.

[19] Shown in an interior photograph preserved in a scrapbook pertaining to the library, LCP Uy8 7065.Q, at p. 31. A "banjo" wall clock shown hanging on the other side of the portrait is similarly unaccounted for. The makers of neither clock are known.

[20] The English refer to such clock cases as "longcase." The American usage, "tall-case," will be used here.

[21] Minutes of the Proceedings of the Directors of the Library Company of Philadelphia, meeting of September 5, 1796, vol. 4, p. 56. LCP archives.

[22] Charles William Janson, *The Stranger in America* (London, 1807), p. 190.

[23] Manuscript, dated 1804, pasted *verso* waist door of Fromanteel clockcase; Zachariah Poulson, *A Chronological Register of the Names of the Members of the Library Company of Philadelphia* (n.d.), p. 3: share #24 was issued to Samuel Hudson on November 11, 1765; Thomas Allen Glenn, "William Hudson, Mayor of Philadelphia, 1725-1726," *PMHB,* vol. 15 (1891), pp. 336-343.

[24] Brian Loomes, *The Early Clockmakers of Great Britain* (N.A.G. Press Ltd., London, 1981), p. 236.

[25] R.D. Dobson, "Huygens, the Secret in the Coster-Fromanteel 'Contract,' the Thirty Hour Clock," *Antiquarian Horology,* vol. 12 (Summer 1980), p. 194.
[26] *Mercurius Politicus,* October 27, 1658; P.G. Dawson, C.B. Drover, D.W. Parkes, *Early English Clocks*, (Antique Collectors Club, Woodbridge, Suffolk, 1982), P. 74.
[27] P.G. Dawson, C.B. Drover, and D.W. Parkes, *Early English Clocks* (Antique Collectors' Club, Woodbridge, Suffolk, 1982), p. 74; *Horological Masterworks, English Seventeenth-Century Clocks from Private Collections* (Antiquarian Horological Society, Wadhurst, and Museum of the History of Science, Oxford, 2003), p. 27.
[28] T.K., Jr., "Cromwell Clock," published in Philadelphia's *National Era,* April 8, 1847, and transcribed in the library's Fromanteel clock file. The identity of its author is unknown.
[29] E.g., Laura Lee, "Library Company Debates Moving," *The Evening Bulletin*, March 8, 1930, a clipping retained in LCP files.
[30] The first pendulum clocks had short (about six-inch) pendulum verge escapements. One of these, an eight-inch high (lantern or table) clock made by Ahaseurus Fromanteel, was owned by nineteenth-century Philadelphia antiquary John A. McAllister (1822-1896), who gave his ephemera collection to the library. On one occasion, when the library's Fromanteel was acclaimed as the earliest clock in the city, McAllister defended the precedence of his own. *The Historical Magazine and Notes and Queries concerning the Antiquities, History & Biography,* vol. 8 (1864), pp. 239-240. McAllister's clock was not given to the library. Its current whereabouts is unknown.
[31] Adam Bowett, *English Furniture, 1660-1714, From Charles II to Queen Anne* (Antique Collectors' Club, Woodbridge, Suffolk, 2002), p. 46, pl. 2:20.
[32] Ibid., pp. 44-46, pls. 2:16 and 2:19. The library's case differs from the St Andrews cases in not having a shell in front of its central plinth, nor any evidence of having had two side plinths. This is based on a visual comparison with pl. 2:20 in Bowett. A physical examination of the design and construction of the St Andrew's cases (see ibid., pl. 2:20) is required to determine if they are from the same cabinetshop as the library's case. The author looks forward to the publication of research on the makers of cases for the clocks of London clockmakers being conducted by Jeremy Evans, who has recently retired from overseeing the horological collections of the British Museum.
[33] Directors' Minutes, January 7 and March 3, 1831, vol. 5, pp. 308-316.
[34] Ibid., June 6, 1796, September 5, 1796, October 6, 1796, November 3, 1796, December 1, 1796, January 5, 1797, February 7, 1797, vol. 4, pp. 54-55, 57-58, 60-61, 64.
[35] S.S. Moore and T. W. Jones, *The Traveller's Directory*, 2nd ed. (Philadelphia, 1804), pp. 7-8; N. Hudson Moore, *The Old Clock Book* (Frederick A. Stokes Company, New York, 1911), pp. 157-158.
[36] Directors' Minutes, May 10, 1832, May 8, 1834, September 4, 1834, February 5 and 12, 1834, May 7, 1835, vol. 6, pp. 20, 62, 65, 70-71, 78.
[37] Ibid., March 5, 1835, vol. 6, p.74.
[38] Lukens was, however, not without success elsewhere. One of his astronomical clocks was purchased in 1835 for the observatory at Germantown Academy. Townsend Ward, "The Germantown Road and its Associations," *PMHB*, vol. 5 (1881), pp. 365, 392. See also George H. Eckhardt, "Isaiah Lukens, 'Town Clock Maker and Machinist,'" *The Magazine Antiques*, vol. 25, no. 2 (February, 1934), pp. 46-48.
[39] Directors' Minutes, May 7, 1835, vol. 6, p. 80.
[40] John Child's share, #410, was held by him until 1871, and thereafter by Henry T. Child until 1888. Mrs. John Child, Sr., the wife of John Child's great-great grandson, continues the family tradition as a library shareholder. John Child, Sr. enjoyed noting to the author that his forebear's life dates befit those of an "All-American" craftsman, in that they coincide with the effective date of the Constitution and the 100th anniversary of the Declaration of Independence.
[41] Directors' Minutes, June 4, 1835, vol. 6, p. 81.
[42] Edward Penington, Treasurer, *Library Company Treasurer's Accounts,* April 27, 1836, second page, LCP records #7447.F.20.
[43] *Association of Centenary Firms and Corporations of the United States* (Christopher Sower, Philadelphia, 1916), pp. 149-150**;** George H. Eckhardt, *Pennsylvania Clocks and Clockmakers* (Devin-Adair Co., New York, 1955), p. 173.
[44] Ibid. It appears that John's beliefs had long hampered business prospects. According to his great-great grandson, John was a Hicksite Quaker who stubbornly refused to serve Orthodox Quakers in his establishment. Author's conversation with John Child, Sr., Philadelphia, July 29, 2004.
[45] The Librarian reported, in 1968, that "[a]ll our old clocks, due to the skill of Edward Lafore [sic], are now in working order." Edwin Wolf, 2nd, *Librarian's Report*, April 11, 1968, p. 179. See LaFond's typed descriptions of the clocks, which remain in the library files, and were consulted for this article.
[46] George H. Eckhardt, "Philadelphia Rarities Saved," *New York Sun*, January [?]**,** 1937, a clipping retained in the library's file.
[47] In 2005, layers of darkened varnish were removed by conservator Alan Andersen in order to reveal the undisturbed grain-painting beneath.

[48] John Child account book, courtesy of Mr. & Mrs. John Child, Sr.
[49] The clock's origins were further obscured by it being called "the Ohio Clock," purportedly because there are 17 stars carved on the front of its case and Ohio was the 17th state admitted to the Union, albeit in 1803. See e-mails exchanged, September 21-December 11, 2004, among the author and staff of the Senate: Melinda Smith, Diane Skvarla, Theresa Malanum, and Karen Paul.
[50] Ibid.
[51] Ibid.
[52] G.H., Baillie, *Watchmakers & Clockmakers of the World* 2nd ed. (N.A.G. Press Ltd., London, 1947), p. 211; Getty Research Institute's Union List of Artists Names lists Martin as "active 1695-1739."
[53] The marriage is recorded as on "30 May 1689." Willam and Ann are thereafter listed in the 1696 Bristol tax records, living in the parish of St. Ewen with their children John, William, and Thomas. The Bristol Record Office information is from a letter to the author from Michael Marsden of Bristol, June 21, 2004.
[54] The feet, height 1 ¾ inches, width 4 inches, and depth ¾ inch, appear in the Moran photos of Library Company relics loaned to the Colonial Furniture exhibition held at the Pennsylvania Museum, December 1919-January 1920. The photos are in the collection of the print and photograph department of LCP.
[55] Mary McGregor Miller, *The Warder Family A Short History* (Clark County Historical Society, Clark County Ohio, 1957), quoting a 1936 letter from Sally Price Warder, in text preceding notes 31-32 and on page opposite text preceding note 32.
[56] The *Canterbury* sailed from the Isle of Wight on September 3, 1699 and reached Pennsylvania on December 3, 1699. Penn's first voyage to his Proprietorship had been aboard the ship *Welcome*, August 30-October 28, 1682, landing at New Castle. In September, 1701, he sailed back to England to defend his interests, never to return.
[57] Frank Willing Leach, "Old Philadelphia Families, CXLIII – Warder," Philadelphia *North American*, December 29, 1912; Edwin Wolf II, "The Library Company of Philadelphia, America's First Museum," *The Magazine Antiques,* vol. 120, no. 2 (August 1981), p. 351, Fig. 2 caption.
[58] W.W.H. Davis, *The History of Bucks County, Pennsylvania* (Doylestown, PA, 1876), p. 192.
[59] John Fanning Watson, *Annals of Philadelphia* (Leary, Stuart and Company, Philadelphia, 1909), vol. 2, pp. 501-502.
[60] One of those properties, a 300 hundred acre plantation known as "Grove Place," which Willoughby had acquired from the Estate of Phineas Pemberton by deed dated February 16, 1702, he conveyed to Solomon on February 18, 1721/1722. Frank Willing Leach, "Old Philadelphia Families, CXLIII – Warder," Philadelphia *North American*, December 29, 1912. For Warder family tree, *see* Mary McGregor Miller, *The Warder Family A Short History,* Appendix.
[61] E.g., on the 17th day of the 6th month 1700, a credit was entered "By Sol. Warder in p[ayment]t for his Man," for £1/10/0. William Penn's Cash Book. Solomon was brother to Willoughby Warder, Jr., the great-great grandfather of William Warder. Mary McGregor Miller, *The Warder Family A Short History,* Appendix.
[62] Will of Willoughby Warder, dated February 24, 1724, proved May 19, 1725, Falls Township, Bucks County, Pennsylvania, in Philadelphia Will Book D, 1725, p. 424, microfilm, HSP.
[63] W.W.H. Davis, *The History of Bucks County,* p. 187**;** *The Papers of William Penn 1701-1718,* ed. Richard S. Dunn, Mary Maples Dunn et al., vol. 4 (University of Pennsylvania Press, Philadephia, 1987), p. 273, n. 26.
[64] E.g., Penn's Cash Book shows a credit on the 2nd day of the 19th month 1701 "By Laetitia Penn pd Ed: Evans Joyner for a Chest of Drawers she gave Mary Sotcher," valued at £7/0/0. William Penn's Cash Book, at the American Philosophical Society.
[65] Hubert M. Cummings, "An Account of Goods at Pennsbury Manor, 1687," *PMHB*, vol. 86 (1962), pp. 397, 398, 408-409.
[66] The original of this inventory is tipped into the front of *William Penn's Cash Book Commencing ye 7th of ye 10th Mth Anno Domini 1699*, American Philosophical Society, Class B No. P38. It is also transcribed in *Correspondence between William Penn and James Logan* [HSP *Memoirs* IX] , vol. 1, pp. 62-64 (Philadelphia, 1870).
[67] *Goods left at Philadelphia the 20th of the 9th month 1701,* tipped into front of *William Penn's Cash Book Commencing ye 7th of ye 10th Mth Anno Domini 1699,* American Philosophical Society, Class B No. P38.
[68] *William Penn's Cash Book,* May 2, 1700, p. 2 credit side.
[69] Ibid., p. 8 credit side.
[70] *Logan Papers*, vol. 1, p. 24. HSP.
[71] *Our Daily Fare*, no. 3 (June 10, 1864), p. 22. The Great Central Fair, which was held in June, 1864, was one of a number of fund-raising fairs held in support of the U.S. Sanitary Commisssion, which cared for the Union wounded during the Civil War. *Our Daily Fare* was its official journal.

[72] A songsheet in the collection of the library, entitled "The Legend of the Clock" and written by a "B. J. Leedom," was previously thought to relate to the library's "William Penn Clock." It instead pertains to another Penn-associated clock, present whereabouts unknown, which was also displayed at the Great Central Fair, but in another department. A manuscript note on the top of the songsheet informs us "This ancient clock was exhibited in the department of Relics, curiosities & autographs, & the following lines were composed & printed by its owner & sold beneath the clock for the benefit of the Sanitary Commission – It may be well to mention that it was the timekeeper of the department. T.J." The songsheet itself provides the following information about the clock before breaking into verse: "This clock was brought over from England by the writer's ancestor in 1682, in the ship Welcome, with William Penn. The lines are suggested by the traditions received from his grandmother, who died in her hundredth year, and who beguiled many of his boyhood hours with the tales of the 'olden time,' of the trials endured by the pioneers in the settlement of 'PENN'S WOODS.' Her mother told her that Wm. Penn was a frequent visitor at her father's cabin; although but a child(her mother) at the time, she could distinctly remember Penn's visits; his taking her on his knee and amusing her, whilst the Indians would gather around in groups from the neighboring wigwams." LCP Songsheet #1235. *Our Daily Fare*, confirms the Leedom clock as being in the Relics department: "There is another ancient time-piece which belongs to Mr. B.J. Leedom, of Germantown, which Mr. L. says came over in the ship Welcome, with William Penn, in 1682." *Our Daily Fare*, no. 12, June 21, 1864, p. 94.
[73] Minutes of the May 2, 1904 Annual Meeting of the Library; George H. Eckhardt, "Philadelphia Rarities Saved," *New York Sun*, January **[?]**, 1937, clipping in the print and photograph department of LCP.
[74] *Pennsylvania Gazette*, February 1, 1775.
[75] George H. Eckhardt, *Pennsylvania Clocks and Clockmakers,* p. 191.
[76] William MacPherson Hornor, Jr., *Blue Book, Philadelphia Furniture* (Highland House Publishers, Washington, District of Columbia, 1977, second printing), p. 56.
[77] Librarian's Report, April 11, 1968; LaFond notes in LCP's Sauer clock file.
[78] Ibid.
[79] German makers used lantern pinions on their wheel trains. The construction differences between Pennsylvania clocks made by clockmakers trained according to English and German traditions are described in J. Carter Harris, *Pennsylvania Clocks 1750-1850* (National Association of Watch and Clock Collectors, Inc., Columbia, Pennsylvania, 2002), pp. 3-4.
[80] Hornor, *Blue Book, Philadelphia Furniture,* p. 56; George H. Eckhardt, "RIDGWAY'S TREASURES Some 300,000 books And Cromwell, Penn and Sauer Clocks," *Philadelphia Inquirer*, September 13, 1959, *Today Magazine*, p. 7.
[81] John Fanning Watson, *Annals* (Philadelphia: Leary, Stuart & Co. 1909), 1:574.
[82] Edward Duffield Neill, "Rev. Jacob Duché, the First Chaplain of Congress," *PMHB,* vol. 2 (1878), pp. 61-62, n.1.
[83] John Fanning Watson, *Annals of Philadelphia,* vol. 1, p. 574.
[84] Carolyn Wood Stretch, "Early Colonial Clockmakers in Philadelphia," *PMHB,* vol. 56 (1932), p. 226; James Biser Whisker, *Pennsylvania Clockmakers, Watchmakers and Allied Crafts* (Adams Brown Co., Cranbury, New Jersey, 1990), 37.
[85] "An Account of the Transit of Mercury over the Sun, on November 9th 1769, N.S.," *Transactions of the American Philosophical Society* (1771), vol. 1, pp. 82-88; Murphy D. Smith, *Due Reverence, Antiques in the Possession of the American Philosophical Society* (American Philosophical Society, Philadelphia, 1992), pp. 2-3, Fig. 1; Edward Duffield Neill, "Rev. Jacob Duché, the First Chaplain of Congress," *PMHB* (1878), vol. 2, pp. 61-62, n.1.
[86] In token of their friendship, Franklin bequeathed Duffield his "French wayweiser, a piece of clock-work in brass, to be fixed to the wheel of any carriage." Edward Duffield Neill, "Rev. Jacob Duché, the First Chaplain of Congress," *PMHB* (1878), vol. 2, p. 62, n.1.
[87] Uncommon elsewhere, but present here and on other Duffield clocks, is a chapter ring center matted in a concentric pattern.
[88] Harrold E. Gillingham, "Early American Indian Medals," *The Magazine Antiques*, vol. 6, no. 6 (December, 1924), pp. 312-314, Fig. 4; Wolf, "The Library Company of Philadelphia, America's First Museum," p. 353, Fig. 5.
[89] The technical expertise and courtesies of Dr. Mones and the eminent English clockmaker John Hooper were invaluable to the research for this article. Both have gained the freedom of the Clockmakers' Company, of which Dr. Mones is the only living American to hold such honor. Duffield purchased his library share in 1768. It was retained by his family until 1844.
[90] Ralph Waldo Emerson, *English Traits* (Boston, 1856), chapter 12.

Plates:

Plate I. Pendulum illustration from Christiaan Huygens, *Horologium Oscillatorium* (Paris, 1673).

Plate II. Trade Card of Philadelphia cabinetmaker Benjamin Randolph, engraved by James Smither (Philadelphia, 1769).

Plate III. Title page from John Smith, *Horological Dialogues* (London, 1675).

Plate IV. Title page from William Derham *The Artificial Clock=Maker* (London, 1696).

Plate V. Strassburg Cathedral clock illustration from Cunradus Dasypodius [Konrad Hasenfratz (1531-1601)], *Warhafftige Ausstellung des Astronomischen Uhrwercks zu Strassburg* (Strassburg, 1578).

Plate VI. Brass dial, tall-case clock by John Fromanteel, c.1673.

Plate VIa. Detail dial and hood of Fromanteel clock.

Plate VII. Library and Surgeons Hall, in Fifth Street, Philadelphia, from William Russell Birch, *The City of Philadelphia in the State of Pennsylvania North America; as it appeared in the Year 1800*, 2nd ed. (Philadelphia, 1804).

Plate VIII. David Rittenhouse, Engraved by James Barton Longacre (Philadelphia, 1836) after a painting by Charles Willson Peale.

Plate IX. Astronomical clock by John Child, Philadelphia, 1835.

Plate IXa. Detail of dial and hood of Child clock.

Plate IXb. Detail of alarm indicator on dial of Child clock.

Plate X. Interior of the Loganian Library in Library Hall on Fifth Street showing Child clock in far niche, in an 1879 drawing by Colin Campbell Cooper Jr.

Plate XI. John Child's account book. *Courtesy of Mr. and Mrs. John Child, Sr.*

Plate XIa. Detail of May 31, 1816 debit entry for U.S. Senate clock from Child account book. *Courtesy of Mr. and Mrs. John Child, Sr.*

Plate XII. Brass dial, tall-case clock by William Martin, Bristol, England, c.1685-1700, known as the William Penn Clock.

Plate XIIa. Detail of dial and hood of Martin clock.

Plate XIII. Interior of Library Hall on Fifth Street, showing Martin clock against the side of a bookcase, in an 1879 drawing by Colin Campbell Cooper Jr.

Plate XIV. Brass dial, tall-case clock by Christopher Sauer, Philadelphia, c.1735.

Plate XIVa. Detail of dial and hood of Sauer clock.

Plate XV. Title page from *Biblia, das ist: die Heilige Schrift Altes und Neues Testaments* (Germantown, Pa., 1743), Christopher Sauer's publication of Luther's German translation of the Bible.

Plate XVI. Brass dial, tall-case clock by Edward Duffield, Philadelphia, c. 1760.

Plate XVIa. Detail of dial and hood of Duffield clock.

Plate XVIb. Detail of name boss on dial of Duffield clock.

Plate XVII. Obverse of Indian silver peace medal from dies engraved by Edward Duffield and struck by Joseph Richardson, 1757.

Plate XVIIa. Reverse of Indian silver peace medal from dies engraved by Duffield, 1757.

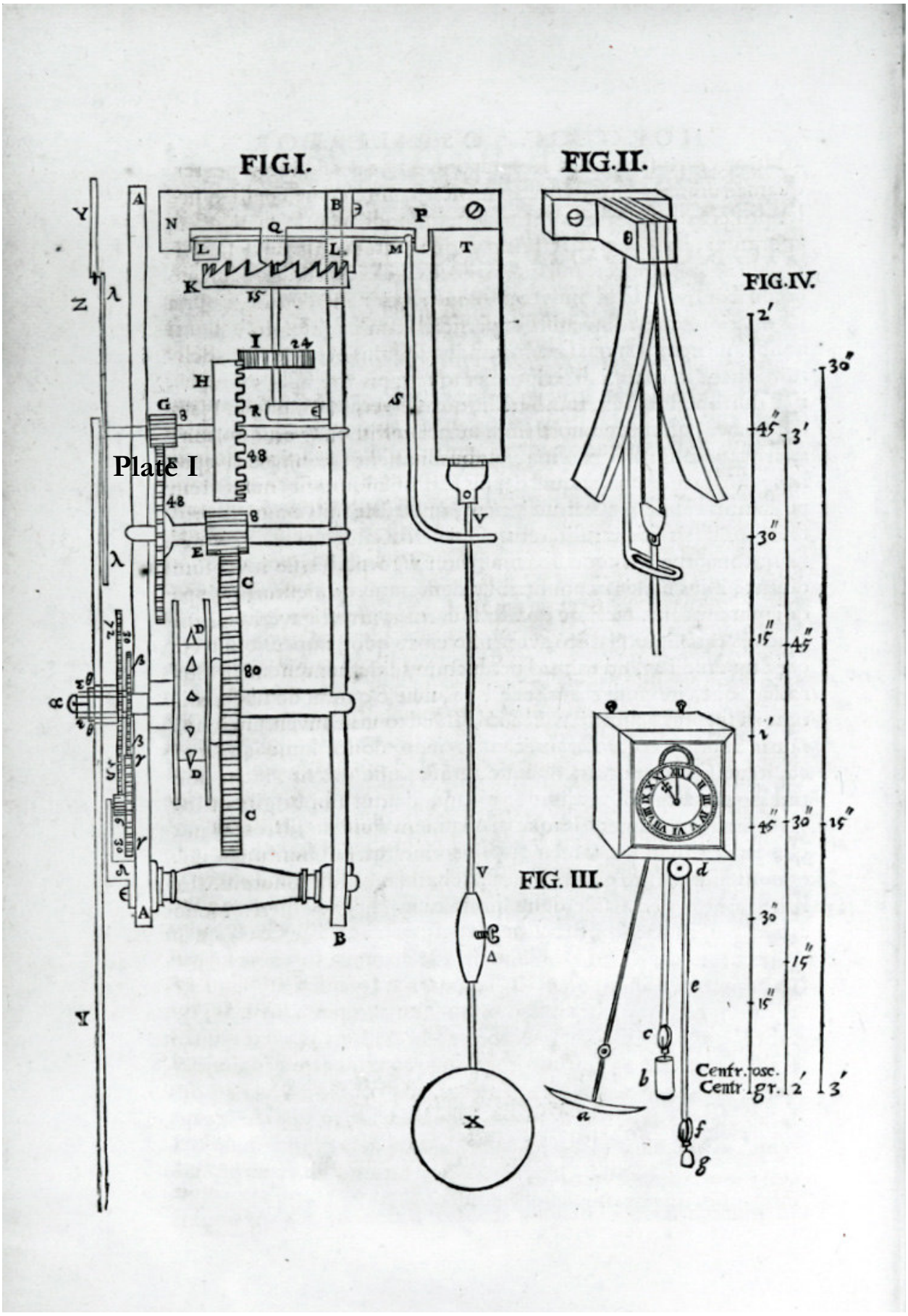


Plate I

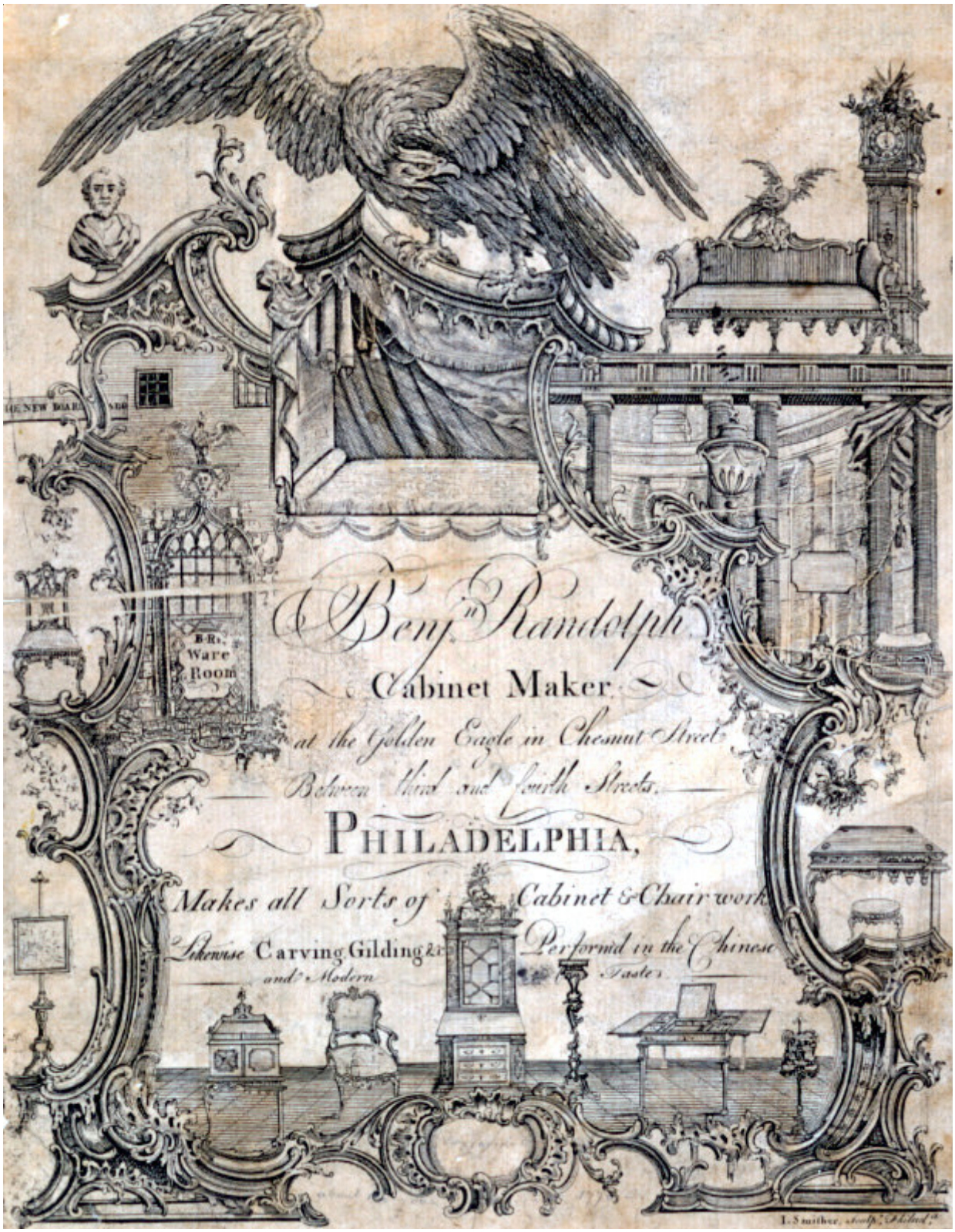
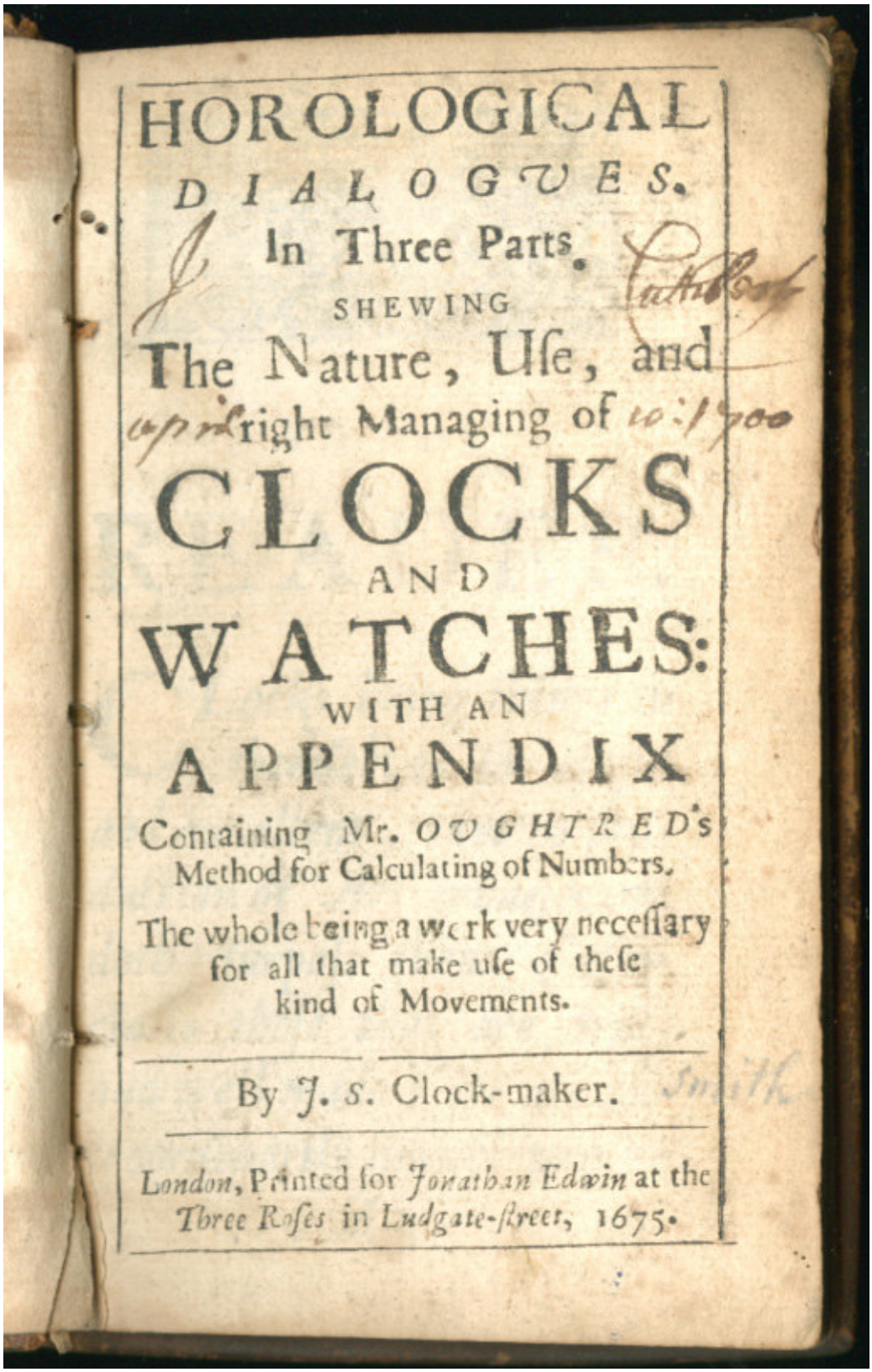

Ben.n Randolph
Cabinet Maker
at the Golden Eagle in Chesnut Street
Between Third and Fourth Streets.
PHILADELPHIA,
Makes all Sorts of Cabinet & Chair work
Likewise Carving Gilding &
and Modern
Performd in the Chinese
Taste
B.R.'s Ware Room

Plate II

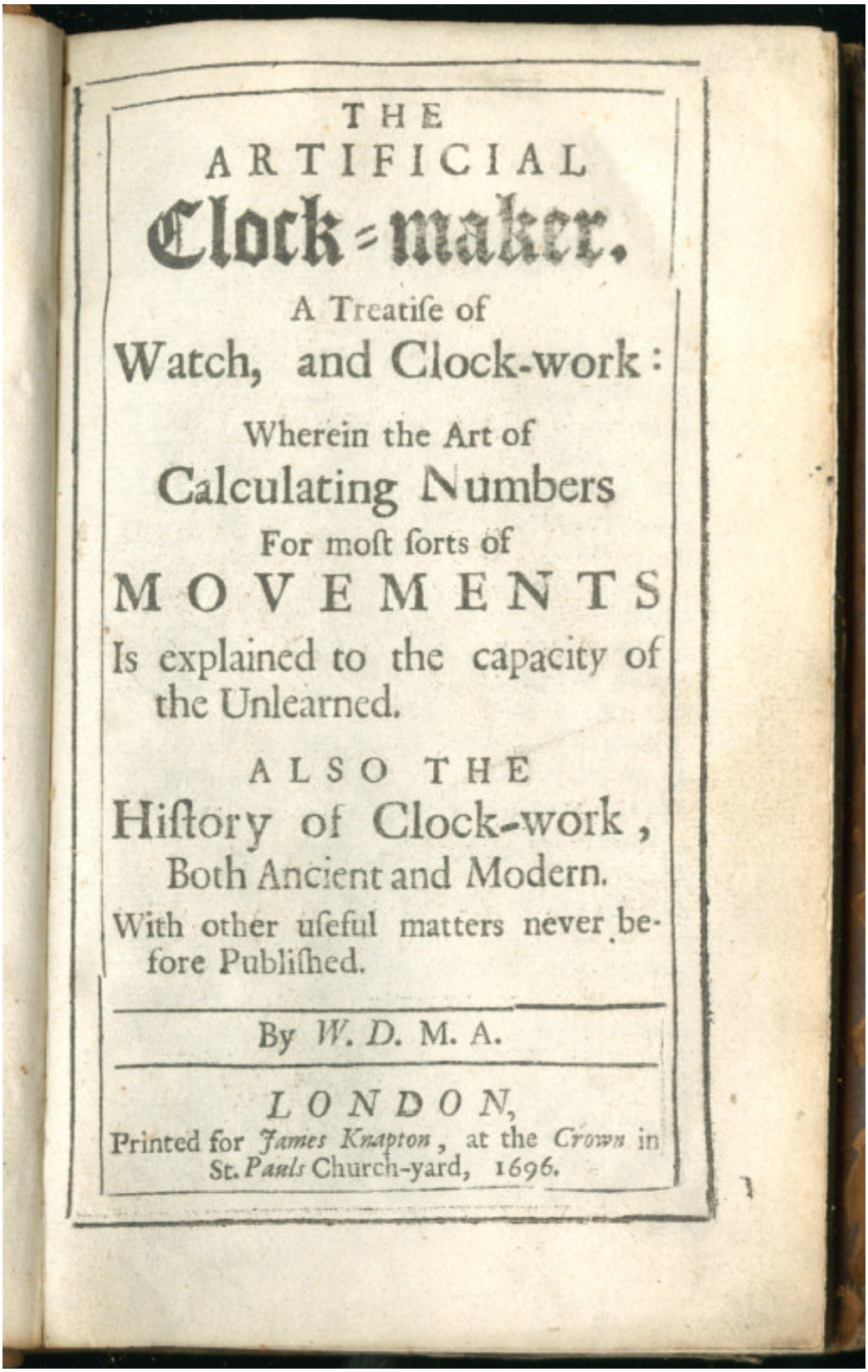


HOROLOGICAL
DIALOGVES.
In Three Parts.
SHEWING
The Nature, Use, and
right Managing of
CLOCKS
AND
WATCHES:
WITH AN
APPENDIX
Containing Mr. OUGHTRED's
Method for Calculating of Numbers.
The whole being a work very necessary
for all that make use of these
kind of Movements.

By J. S. Clock-maker.

London, Printed for Jonathan Edwin at the
Three Roses in Ludgate-street, 1675.

Plate III



THE
ARTIFICIAL
Clock-maker.

A Treatiſe of
Watch, and Clock-work:

Wherein the Art of
Calculating Numbers
For moſt ſorts of
MOVEMENTS
Is explained to the capacity of the Unlearned.

ALSO THE
Hiſtory of Clock-work,
Both Ancient and Modern.
With other uſeful matters never before Publiſhed.

By *W. D.* M. A.

LONDON,
Printed for *James Knapton*, at the *Crown* in St. *Pauls* Church-yard, 1696.

Plate IV

Warhafftige
Außlegung des Astronomischen
Vhrwercks zu Straßburg/beschriben
Durch
M. Cunradum Dasypodium/der solches Astronomische
Vhrwerck anfenglichs erfunden/vnd angeben.

Gedruckt zu Straßburg bey Nyclauß Wyriot.
M. D. LXXVIII.

Plate V

Plate VI, VIa

Plate VII

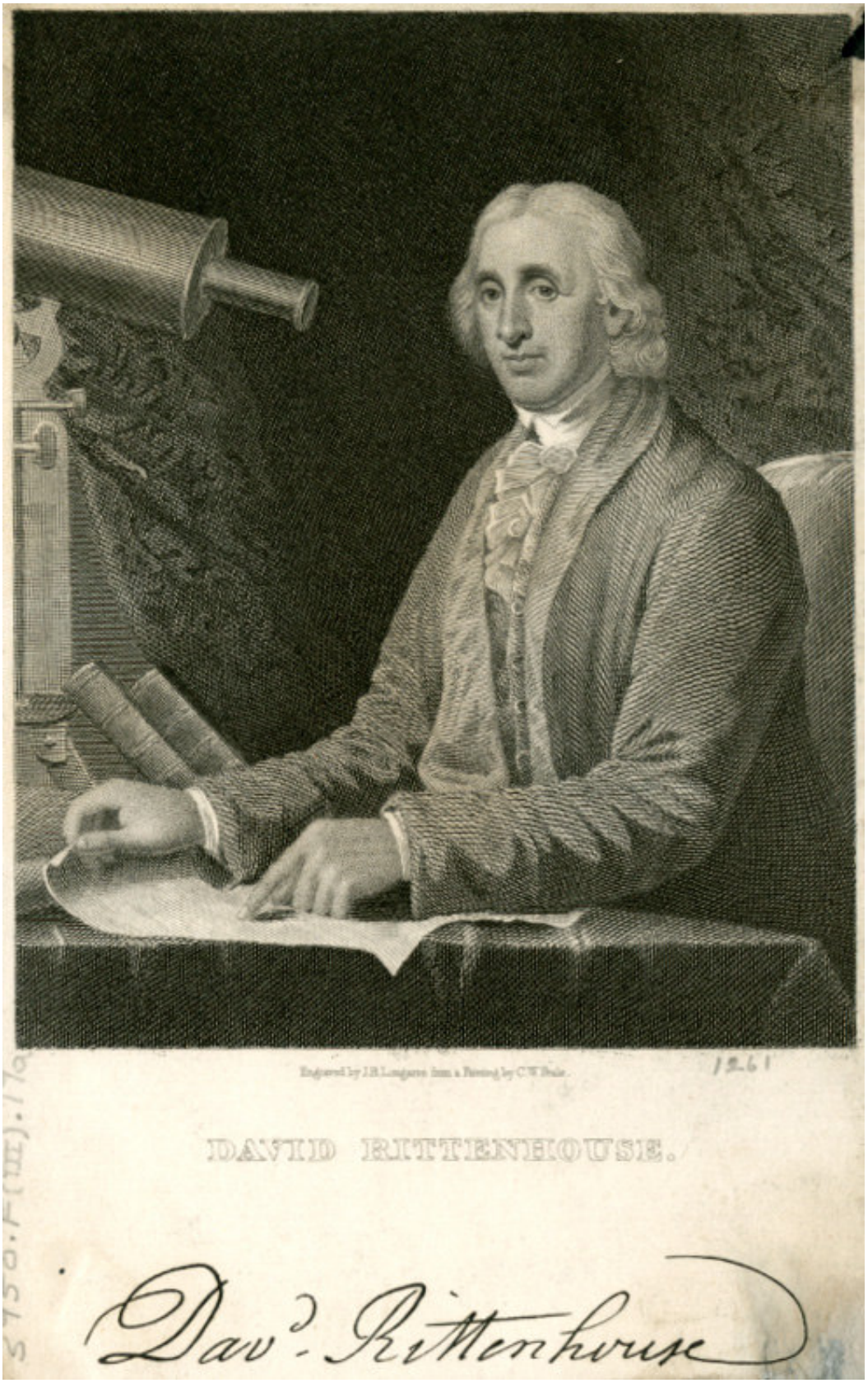
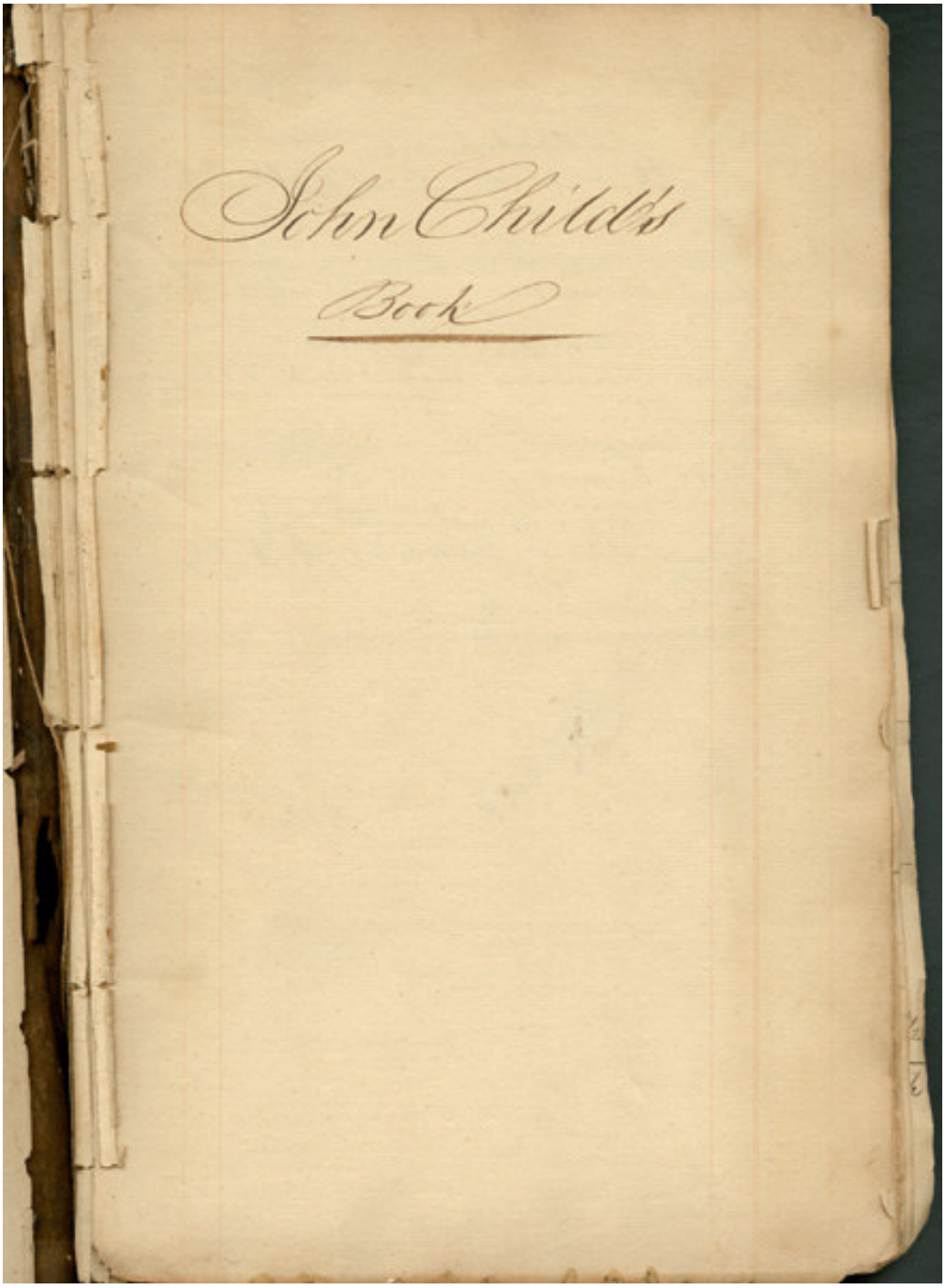


Plate VIII

Plate IX, IXa, IXb

Plate X



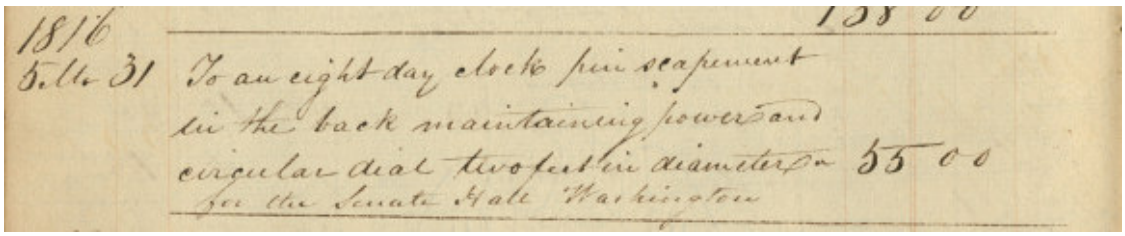


Plate XI, XIa. Courtesy of Mr. and Mrs. John Child, Sr.

Plate XII, XIIa

Plate XIII

Plate XIV, XIVa

BIBLIA,

Das ist:

Die

Heilige Schrift

Alten und Neuen

Testaments,

Nach der Deutschen Uebersetzung

D. Martin Luthers,

Mit jedes Capitels kurtzen Summarien, auch beygefügten vielen und richtigen Parälleien;

Nebst einem Anhang

Des dritten und vierten Buchs Esrä und des dritten Buchs der Maccabäer.

Germantown:

Gedruckt bey Christoph Saur, 1743.

Plate XV

Plate XVI, XVIa, XVIb

Plate XVII, XVIIa