

# AN UNRECORDED SILESIAN SUNDIAL

## BY JOHN ROWLEY

MACIEK LOSE

### John Rowley

John Rowley (ca. 1668–1728) was one of the most prominent English mathematical instrument makers at the beginning of the 18<sup>th</sup> century. In the year 1715 his merits were acknowledged by King George I who awarded him the title of ‘Master of Mechanicks to the King’. Rowley made variety of scientific, measuring and artillery instruments during his career, including: rulers, protractors, quadrants, sextants, length and weight scales, globes, different types of sundials, Copernican spheres and above all, the most famous – complex, mechanical models of the solar system, being predecessors of today’s planetariums, named ‘orreries’ after Rowley’s patron Charles Boyle, 4<sup>th</sup> Earl of Orrery.

Some of John Rowley’s instruments were commissioned by the Royal Court or trade companies and were gifts for the crowned heads of the time - including Tsar Peter the Great, Charles VI Habsburg and the Emperor of China. From amongst the works made for British nobility and the Royal Court, the best known is a set of four beautiful sundials for Blenheim Palace, and of the continental works – a sundial for the king’s residence garden in Hannover.

John Rowley was also a possible maker of the Cranbury Park sundial,<sup>1</sup> commonly attributed to Isaac Newton. Rowley is believed to have had a trade connection with Thomas Tompion, the most well-known master of that time focused on manufacturing of mechanical clocks, for whom he is thought to have made sundials.<sup>1</sup>

Rowley’s work had a large impact on his contemporaries: he brought craftsmanship to new levels of precision, and introduced aesthetic and scientific standards for the next generations of instrument makers.

The Silesian sundial of John Rowley is a typical garden dial, and the greatest puzzle is the very unusual—for a London instrument maker—place for which it was made.

### Silesia and its Capital: Wrocław

Silesia (Pol: Śląsk, Ger: Schlesien, Lat: Silesia) is a geographical region located today mostly in south-western Poland, with its capital in the city of Wrocław [ˈvrɔʦfswaf] (Ger.: Breslau, Czech: Vratislav, Lat.: Wratislavia). During more than a millennium of written history the region—located in the middle of the Central Europe—was influenced by Polish, German and Czech cultures, and changed its national affiliation numerous times. British historian Norman Davies extensively explores Wrocław in his epic book<sup>2</sup> *Microcosm* – a title which perhaps most fully encompasses its cultural diversity and complicated past.

In first decades of the 18<sup>th</sup> century—the period of flourishing baroque that we are interested in—Silesia and the city of Wrocław were for almost two centuries under the rule of the Habsburg monarchy. During the Habsburg reign Silesia, one of the most economically developed lands of the monarchy, attracted many noble families of Austrian origin to settle there, among them the family of Neidhardt von Spattenbrunn whose coat of arms is visible on Rowley’s sundial (Figs. 1 & 2).



Fig. 1(a & b). Oblique and frontal views of John Rowley’s Silesian sundial.





Fig. 2. Detail of the Neidhardt's von Spattenbrunn coat of arms and inscription with the sundial's geographical location: "Breslaw Latt. 51° 02' " in the upper part of the dial.

Fig. 3. Cardinal Eberhard Neidhardt (1607-1681), the most well-known member of the Neidhardt family. Painting by Alonso del Arco, Prado Museum in Madrid.



### Neidhardt's Residence

The Neidhardt von Spattenbrunn family is known in Europe mainly because of cardinal Eberhard Neidhardt (1607-1681), the preceptor of young emperor Leopold and princess Mariana, and later on (1666-69) Grand Inquisitor and *de facto* prime minister of Spain. (Fig. 3.)

The most likely commissioners of the sundial were either the cardinal's nephew, Johann Baptist Snr (1645-1722), or one of his sons, Johann Baptist Jnr (1675-1744). Both men were high ranking officers in the Silesian government. Johann Baptist Snr studied philosophical sciences in Siena and law in Prague, and in the year 1703 he was appointed as president of the Silesian Chamber Council. His son served as vice-president of the Council, and in 1731 he became administrator of the Wołów (Ger.: Wohlau) County, and in 1733 of Legnica (Ger.: Liegnitz), second city in Silesia in terms of population.

Around 1689, Johann Baptist Snr bought the estate of Krzyków (Ger.: Krichen, Kriechen), located some 4 km to the east of Wrocław, at latitude 51° 06'. Adjacent to the residence built at Krzyków, a baroque garden was founded, said by contemporaries to be one of the most beautiful private gardens in Silesia. The garden is mentioned in several monographs of the period, including Hennenfeld's *Silesiographia renovata*<sup>3</sup> printed in 1704, and in the book by Sinapius<sup>4</sup> from 1720.

The horizontal garden sundial by John Rowley can be linked with this complex. Due to the spatial transformations of the Krzyków estate over following centuries, no significant remnants of Neidhardt's former residence and garden survives to our times. The only probable remainders are stonework masonry foundations of several ruined outbuildings and the general contour of the complex, visible from a bird's eye view and bordered by characteristic elements of topography.

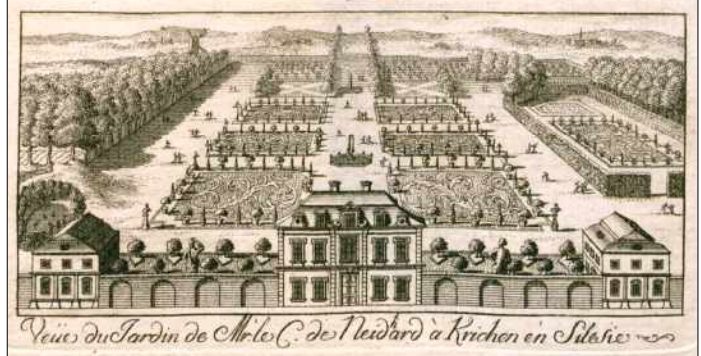
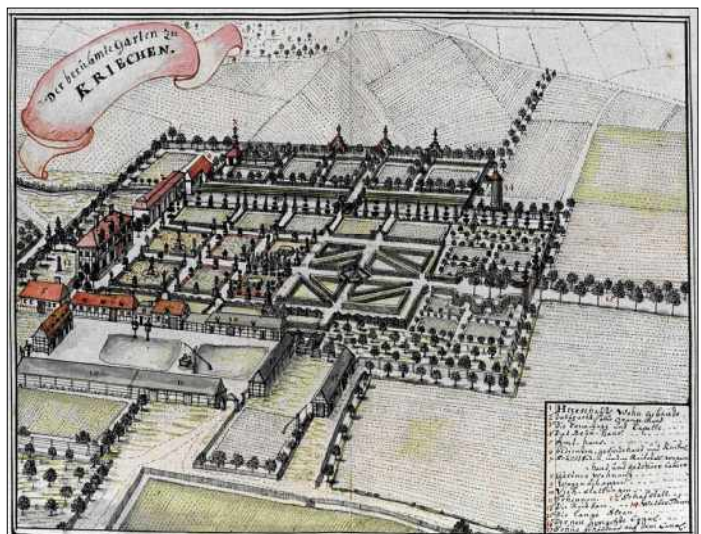


Fig. 4. Contemporary views of the Neidhardt's residence in Krzyków (Ger: Krichen/ Kriechen), with the formal garden thought to be the location for which the sundial was designed. (a) View by Friedrich Werner from the mid-18<sup>th</sup> century, (b) from Johann Haunold's book of friendship. Unfortunately, neither of the views include sundial.



Fortunately, two graphical representations of the garden complex still exist. The author of the first, from the mid-18<sup>th</sup> century, was the renowned engraver Friedrich Werner<sup>5</sup> (Fig. 4a); the other—earlier and highly idealized—comes from Johann Haunold's *Stammbuch* (book of friendship)<sup>6</sup> (Fig. 4b) which was reprinted in a publication of Pierre Le Lorrain de Vallemont<sup>7</sup> from 1708.

The drawings from 1708 had been engraved probably several years before the sundial was made. Werner had a chance to record the sundial but it also does not appear on his drawing. The sundial must have been placed in a prominent, exposed and unshaded place within the garden, mounted on a pedestal standing on a plinth, possibly located at the crossing of footpaths or within one of the main quarters. Werner is known to have made his final graphics based on the working plans which were redrawn many times and corrected in details, to annoyance of later researchers. Based on that, it can be assumed that Werner didn't know the place in detail, and could have omitted the sundial which was a relatively small garden feature or the sundial was lost in one of the subsequent versions of the drawing.

Apart from the missing sundial, two intriguing pedestals appear on Werner's depiction within garden quarters. If they are not figments of the engraver's imagination, they could have been used by the garden's owner to perform astronomical observations. Similar structures—also located within the garden—are known to have been used by Nicolaus Copernicus in Frombork to perform his observations some 150 years earlier.



Fig. 5. Lower part of the dial with the detail of John Rowley's florid script signature. Note engraving of the city Dantzick (today's Gdańsk) with the flipped letter 'z' and capital letter 'K'. The two letters are engraved in different style, suggesting that they were cut by a different person.

### The Dial

John Rowley's Silesian sundial is a type of classic, brass garden horizontal dial, fitted with gnomon pointing to the north celestial pole. The dial is of octagonal shape, 346 mm (13.62") across the flats, and 4 mm (0.16") in thickness.

There are eight mounting holes in the corners of the dial showing scratches – evidence that the dial was mounted to the pedestal at some point (Figs. 1, 2 & 5). The dial is divided into a number of concentric, engraved rings. Counting from the outside:

- \* the precise time ring, engraved to one minute intervals and labelled every 10 minutes,
- \* the main hour ring, inscribed with roman numerals from IIII through XII to VIII, read from the outside,
- \* the general time ring, divided into larger intervals of 1/8, 1/4 & 1/2 hours, and marked with decorative *fleur de lys*,
- \* two geographical rings,
- \* 8-point compass rose in the centre of the dial.

The time and hour rings terminate at the S of the dial in a decorative scroll, whereas the geographic rings are finished with undulating ribbons, ending with knots and tassels.



Fig. 6. An early Rowley garden horizontal sundial, dated ca. 1700, with the hour numerals engraved to be read from the outside of the dial, and geographic place names along the hour lines. Courtesy of Oxford Museum of the History of Science.

The method of inscribing hour numerals to be read from the outside of the dial indicates that the sundial was made probably around the year 1710 the period when Rowley popularised the method, being more convenient in use than previous formula of reading numerals from the inside while making the four large Blenheim Palace sundials.

The change in the direction of engraving the hour numerals must have taken place in the first decade of the 18<sup>th</sup> century as, on Rowley's early double horizontal dial dated c.1700, they are still read from the inside, whereas on a similarly-dated garden dial in the Oxford MHS collection (Fig. 6) the numerals are read from the outside. Beginning with

Rowley, this new method became standard in sundial making for London makers over the next decades.

The mature aesthetic composition of the sundial, balanced in terms of amount of decoration and information, as well as perfect engraving, further implies dating of the dial to the second half of Rowley's career.

In the upper part of the dial, a heraldic cartouche of the Nidhard von Spattenbrun family is engraved, below which sundial's intended location reads: "Breslaw Latt. 51° 02' ". The latitude given on the dial differs by 4 arc minutes from the actual location of Neidhardt's garden in Krzyków, the supposed original location of the sundial. The difference is small given the fact that Wrocław/Breslaw was far from the main sea routes and the largest European metropolises of the time, for which geographical coordinates were known most accurately. It can be noted here that in the same period as the manufacture of Rowley's dial, a far more substantial error of 12 arc-minutes in latitude occurred on several important sundials made by John Bradlee for St Petersburg<sup>8</sup> (which at that time was an incomparably more prominent city than Breslaw).

Inside the inner time ring there are two geographical rings with engraved place names and their respective moments of local noon, marked with a roman 'XII'. This method of marking the time of noon at various places follows the method used by Rowley on the 'geographic' sundial for Blenheim Palace dated 1710, which has three similar rings (Fig. 7). The method is quite different from an earlier garden dial, currently in the Oxford MHS collection, in which the place names are engraved along time lines originating from the origin of the gnomon (Fig. 6). The names of the places engraved on the dial are listed in Table 1.

Outer geographic ring	Inner geographic ring
XII Mexico	Strag:Magelan XII
Bermudus XII	Surinam XII
Tenieriff XII	Pernambuco XII
London XII	Dublin XII
Rome XII	XII Paris
Constantinop XII	XII Dantsick
Bagdat XII	XII Ierusalem
Suratt XII	XII Ispahan
Bantam XII	XII Agra
Nangesaque XII	Pekin XII

Table 1. The geographical place names in the dial.

It is worth noticing the inscription manner of the name of today's city of Gdańsk as *Dantsick*, with a mirrored letter 'z' and uppercase letter 'K' (Fig. 5). Capitalization of the letter 'K' within a word appears commonly on the instruments and in the writings of the 18<sup>th</sup> century – see, for example, Pierre le Maire's Butterfield type sundial, described by Mike Cowham in the March 2010 issue of *Bulletin*.<sup>9</sup> However, it is to be noted that on another city that includes letter 'k' – *Pekin* – a lowercase character was used. The different engraving styles of the above-

mentioned letters may imply that they were cut by a different person.

The central part of the dial is occupied by a richly decorated, 8-point compass rose, which to the North is culminated with decorative lily flower – *fleur de lys* – split into two parts by the gnomon.

The directions are described with symbols: *NE, E, SE, S, SW, W, NW*, engraved in the classic manner – to be read from the inside of the dial. It seems that Rowley practiced this method of describing directions until the end of his career, as it also appears on the royal sundial in Hanover, dated 1719. A similar co-existence of new and old engraving style (which is helpful in dating dials by Rowley's contemporaries) can be found on the garden sundial by Samuel Saunders, who worked for Rowley between 1702-1715.<sup>9</sup>

The cardinal directions are engraved with larger typeface, the North is indicated with letter 'N' located within the noon gap.

The maker's signature is placed on both sides of the noon gap, written in a sweeping, florid script font that reads: *John Rowley Londini Fecit* (Fig. 5). Comparison with Rowley's other signatures reveals that it is similar to those that can be found on earlier instruments and on his indenture. On later instruments, Rowley used a signature of a more modern typeface – though it is possible that both styles coexisted and were used depending on the aesthetic concept chosen for each instrument.<sup>10</sup>

It should be noted that the dial doesn't include the Equation of Time, either as table or as a ribbon, both forms used by Rowley.

### Inscription

The back of the dial reveals three hammered tenons for the gnomon's mounting and nearby, the engraving of an intriguing acronym "RHPH" (Fig. 8). The method of gnomon mounting is typical for garden dials from the begin-



Fig. 7. A section of the Rowley 'geographic' dial at Blenheim Palace, dated 1710, with three rings marked with place names and their local noon times. The Silesian sundial strictly follows this pattern. Note the outward facing hour numerals and inward facing descriptions of the compass rose directions, again like the Silesian sundial.

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Fig. 8. View of the central area of the dial's back with one of three hammered tenons of the gnomon mounting and engraved with a contemporary inscription "RHPH", which may be intuitively expanded as: 'Royal Highness Prince(ess) of Hanover'.

ning of 18<sup>th</sup> century and proved to be very effective as the gnomon is still firmly mounted. The letters "RHPH" could be deciphered as the workshop code of one of the Rowley's workers, though none of his known apprentices had these initials. A more convincing hypothesis is that the inscription is related in some way with the dial's commissioner. The most obvious interpretation of "RHPH" is: 'Royal Highness Prince(ess) of Hanover', the title of the future King George II and his wife Caroline von Brandenburg-Ansbach (Fig. 9). It is possible that the sundial was a royal gift for the Neidhardt family, or—less likely—it was commissioned with help of the Prince's court.

Princess Caroline was raised in Berlin (which is close to Wrocław) and was a well-educated woman who maintained intellectual contact with the most notable intellectuals of the time – Leibniz, Newton, Voltaire and others. She had an important role as the patroness of British gardens and commissioned remodelling or founded new complexes, including Richmond Lodge, Kensington Gardens and Hampton Court Palace, this last where a garden sundial signed by Tompion and possibly made by Rowley<sup>1</sup> is still located. There are strong indications pointing to her as a link with the Neidhardts who were well-educated garden art enthusiasts with wide European contacts.

Another suggestion supporting the theory that the sundial was a gift for the Neidhardts is the maker himself and the place of manufacture. One could argue that if the Neidhardts were to commission the dial themselves, the natural choice would be to visit one of the known Central European workshops such as Prague, Vienna or perhaps one of the South-German cities, rather than London.

It is to be stressed that this author could not find strong proof to support these intuitive speculations of personal connections and hopes that readers will help in their positive verification or redirect investigation onto another track!

Fig. 9. Queen Caroline of Brandenburg-Ansbach (1683–1737), possible commissioner of the sundial or an agent between the Neidhardt's and Rowley. Painting by Sir Godfrey Kneller, National Portrait Gallery, London.



### Gnomon

The gnomon of the dial has dimensions of  $156 \times 177.5 \times 8$  mm, its angle measures about  $51^\circ$ , which corresponds well to the latitude given on the dial. The gnomon is pierced with floral scrollwork (Fig. 10).

Comparison with other sundials of the period reveals that the gnomon of Rowley's sundial is very similar to the one on the garden horizontal sundial signed by Thomas Tompion and dated around 1705. That sundial is better known to the public because of its discovery in an attic and later record sale at a Sotheby's auction in 2002.

The Tompion and Rowley sundials have quite similar dimensions and were made for similar latitudes. The dimensions of the Tompion dial is  $30.5 \times 30.5$  cm, which is smaller than Rowley's by 4 cm; and the latitude on Tompion's is  $50^\circ 54'$ , which is only  $8'$  different from the Wrocław/Breslaw sundial.

Closer investigation reveals a number of minor differences between the two gnomons suggesting that they rather did not come from the same mould but certainly they were made based on a pattern from the sketchbook and possibly in the same workshop.

Of the differences between the two, most characteristic are (a) a different profile of gnomon tip and (b) thinner cross-sections of the Rowley's gnomon scrollwork. Contrary to what can be seen on Tompion's gnomon, the curvature of the scrollwork's inner side doesn't continue – this is a very unnatural break, shown with an arrow on the photograph (Fig. 10) and seems to be a modification of a standard sketchbook design. It may suggest that Rowley – aware of overall heaviness of the gnomon's design seen on Tompion's signed dial – searched for a way to upgrade scrollwork by reducing thickness of bars and which to some extent affected the purity of the composition in this section of the gnomon.



Fig. 10. Comparison of (top) Tho Tompion's signed sundial, dated ca. 1705, and the side view of the gnomon of the Rowley sundial below. The gnomons are very similar but with very minor differences including: shape of the ending profile of the gnomon bars, width of the scrollwork bars with the Rowley's being slightly more lightweight and a shape of the scrollwork in the place marked with an arrow, where the curved lines of Rowley's gnomon are lacking the continuity present in the Tompion example. Tompion sundial image courtesy of Sotheby's.

The close resemblance of gnomons supports John Davis's hypothesis put forward few years ago, according to which Rowley crafted some of sundials signed by Tompion.<sup>1</sup>

Apart from the gnomons discussed here, a number of other features of Tompion's sundials that are characteristic of Rowley's craftsmanship suggest that Tompion, a generation older than Rowley and focused on mechanical clocks, decided to subcontract rare sundial commissions to his talented junior colleague.

### Fortunes of the Dial

Originally made by an English master craftsman for the Silesian region, at that time under Austrian rule, the sundial changed its national affiliation several times during the next three centuries of its history, never being far from Wrocław. It survived in unexpectedly good condition (actually one of the best of Rowley's known garden dials) many wars and

turmoil which passed through this part of Europe over the centuries.

It was found in 1970s, in the village of Pogwizdów (latitude 50° 57'), located a distance of 65 km to the west of Wrocław, the direction opposite to that of the Krzyków estate for which it was most probably made. According to all the revealed historical data, Pogwizdów village was never owned or connected with Neidhardt von Spattenbrunn family. The only interesting connection is the fact that in the year 1797—some 85 years after the sundial was made—August Neidhardt von Gneisenau, the later Prussian general who, together with Wellington co-defeated Napoleon at Waterloo, and who originates from different branch of Neidhardt family tree, took his marriage vows nowhere else but in a small village church in Pogwizdów!

Today, the sundial is in Wrocław again, close to the place for which it was originally made, and its description together with still not fully discovered history can be presented to the readers of *BSS Bulletin* thanks to the cooperation of Polish and British sundial enthusiasts.

In the search for a phrase to conclude the description of the history of the Wrocław sundial by John Rowley, I recall the title of the BBC popular-science TV series by James Burke – 'Connections'.

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