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The Astronomical Clock by Paulus and Ghiesbreght

Book Review

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The Astronomical Clock by Paulus & Ghiesbreght

Author: Dr Huib J. Zuidervaat

Details: Hardcover, 170 pages,
249 x 297 mm

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Zuylenburgh

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Order from: planetariumzuylenburgh.com

Figure 1. A small number of copies of the book is still available from Planetarium Zuylenburgh.

The multiple lives of an impressive Astronomical Cabinet clock are told in engaging detail in this new book, *The Astronomical Clock by Paulus and Ghiesbreght*, published by Bert Degenaar under his Planetarium Zuylenburgh imprint.

About two-thirds of the book is dedicated to a technical analysis of the instrument, including extensive photos of the original drawings compared to existing mechanism, while the balance recounts the history and biography of the various protagonists in its 254-year story.

The remarkable clock was built by a lay Jesuit living in Belgium, Jean Paulus. He started it in 1771 and seems to have mostly completed it, although it was in pieces when he died in 1781. The remaining apparatus of the clock, and numerous related papers were then acquired by Michel Ghiesbreght, a young Brussels mathematician and instrument repairer.

Ghiesbreght re-assembled the mostly-extant collection of parts, and then managed to re-cast it as mostly his own work, spending a happy lifetime on the coat-tails of the acclaim he thus received. He offered it to Napoleon as a gift – this was rejected, but it caused such interest in the clock that he drew much attention from contemporary scientific worthies.

After Ghiesbreght, the clock passed to the cartographer Vandermaelen. He established the *Établissement Géographique de Bruxelles* – a sprawling museum-cum-cartographic institute. However, the clock appears not to have been on public display there. It vanished in 1880, re-emerging in 1903 when it was bought by Jean Van der Borght, a Brussels brewer and amateur restorer. Van der Borght made extensive changes to the clock, adding a musical drum, mechanical calendar with personal and saintly entries, etc. Van der Borght also seems to have sought acclaim by association with the clock.

By the mid-20th century, the clock had passed to one of his descendants, Paul Raymaekers. In 1952 the clock was loaned to the



Figure 1. Bert Degenaar with Paul Raymaekers on the day of the clock's transfer in 2017. Photo: Arie de Ruiter.

Brussels City Museum. In the 1980s Raymaekers began negotiating its return and restoration. A bit like Van der Borght, Raymaekers seems to have sought a certain degree of public prestige by this 'restoration', but his private instructions regarding the work were clear: it was to be purely cosmetic. The clock continued to decline, with large parts of the original mechanism lost or badly damaged. He withdrew it from the museum and

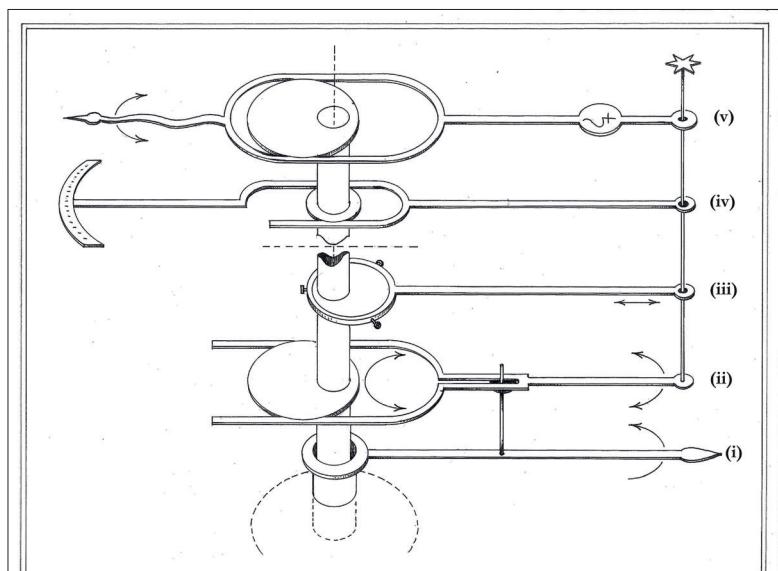


Figure 4. Drawing by Pieter de Ruiter to explain one of the pointer systems in the machine. The scale (iv) follows the elliptical motion of a star, derived from the use of offset circles driven around a central axis.

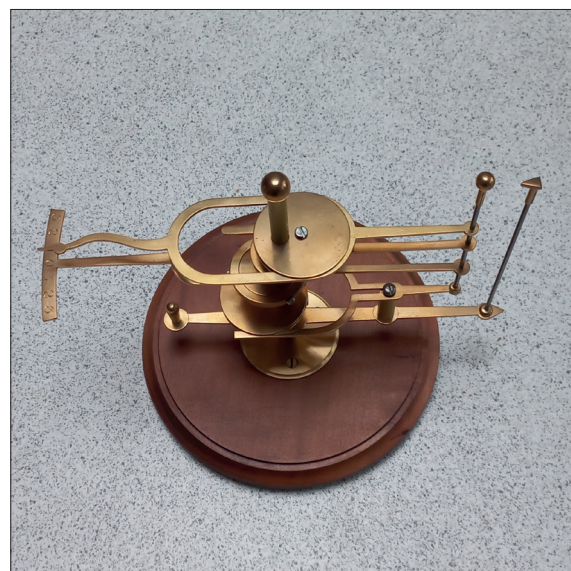


Figure 5. Model by Pieter de Ruiter to demonstrate the principle illustrated. In this view, a planet (top small sphere) is at perihelion (sun is large sphere).



Figures 6 and 7. The clock as received in 2017 had extensive damage, for instance (left) by application of excessive force, and (right) a tooth lost by apparently having been cut too deeply. The early remedy: a replacement tooth from the tip of an added crossing..

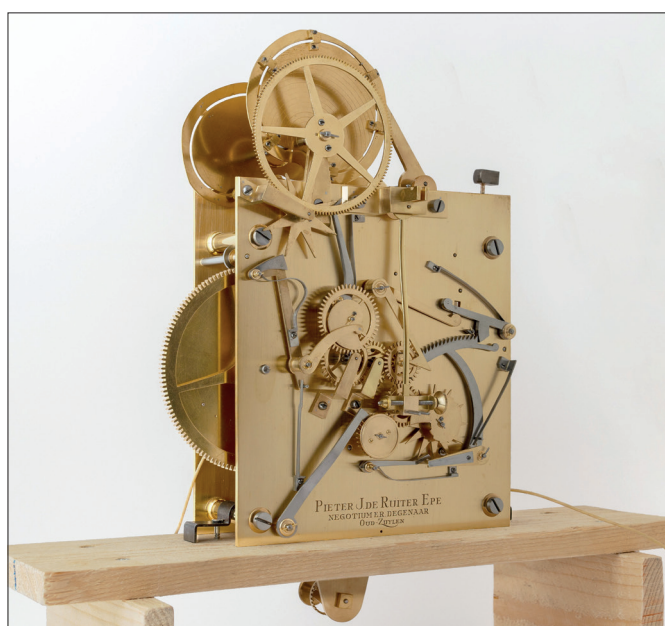


Figure 8. De Ruiter had to make this entirely new movement for the central clockwork, following the original specifications. He says: 'Apart from the new central clock, I think a surprising amount of gears dates from the 18th and early 20th centuries.' All unused parts are stored within the clock cabinet. Photo: Arie de Ruiter.

unsuccessfully tried to sell it to raise money for his social science foundation in the Congo.

The clock's tribulations finally settled when Raymaekers agreed to sell it to Bert Degenaar in 2017. Degenaar is a noted collector of horology and scientific instruments, with a private museum in Oud-Zuylen near Utrecht

The Degenaar-Raymaekers nexus finally afforded the clock with someone who has the means and the will to present it as it was likely to have been conceived all those years ago by its maker, Jean Paulus.

Degenaar had the vision to entrust the work to his long-time clockmaker and instrument maker, Pieter de Ruiter. He also has the connections to ensure that the clock is afforded a reliable and appropriate long-term public display.

The book is much more than a mere biography, or indeed a technical account of a clock. Dr Zuidervaart examines the motives and ethics of the various players, and explores the concept of 'cultural capital' – the prestige or social standing afforded by association with an object – and importantly, the degree to which (or not) each of its various owners actively pursued this. The clock therefore becomes a touchstone of human motives.

There is also an exploration of the relative importance of the various conflicting scientific views expounded by the clock's displays (the cosmic systems of Capella and Copernicus), and what we can learn as a result of the modern research into the clock and its re-building.

The book also finally sets the record straight regarding the clock's originator – Jean Paulus. His papers and documents are presented in addition to contemporary testimony. There is no doubt now that Paulus is the originator, and Ghiesbreght the re-assembler and promoter.

The book itself is beautifully crafted, with high-quality photographs and typesetting that encourages reading. Bound in green cloth covered boards, there was also limited numbered run with matching slipcase, although the latter are all sold. There is an extensive list of Further Reading and a useful index. The book is to be recommended for those with a technical interest and for those who want to explore the adjacent social aspects of history.



The Astronomical Clock

by Paulus & Ghiesbreght

The Astronomical Cabinet by Jean Paulus and Michel Ghiesbreght which is the subject of the book review on page 456 has recently undergone the most considered and comprehensive restoration of its 154-year life. The imposing device is over three metres wide and over two and a half metres tall. There are moving globes, armillary orreries (planetariums) and a host of astronomical indications.

The armillary orreries represent different cosmological systems:

Copernican (Heliocentric)

- Sun at the centre
- Planets revolving round the sun
- Earth shown with its moon

Capella System

- Mercury and Venus orbit the Sun
- The Sun with its two attendant planets orbits the earth
- The moon orbits the earth, along with the other planets

The Capella system is a peculiar fifth-century hybrid adopted by Jesuits as a sort of compromise between geocentrism and heliocentrism.

There are Terrestrial and celestial globes which show:

- Earth's rotation and inclination
- The visible constellations

The clock also shows the Sun's position in the zodiac, the moon's age and node (indicating possible eclipses), and indications of day vs night and sunrise – sunset around the globe.

Van der Borcht's 1903–1910 restoration added more complications, including astrological angel numbers, music drum and chimes and commemorative plates to the calendar disc indicating the dates of death of family members, his own birthday and wedding, and even the instrument's purchase (April 1903). These were all removed or disabled in the Degenaar-De Ruiter restoration of 2017–2022.

When Degenaar and De Ruiter had completed their restoration, Bert Degenaar loaned the clock to the Royal Eise Eisinga Planetarium museum in Franeker. It has just now been moved to a temporary exhibition at the Sonnenborgh observatory museum in Utrecht.

The Planetarium Zuylenburgh (see rear cover)

The Zuylenberg estate in Oud-Zuylen is home to a private museum hosting a phenomenal collection of scientific instruments, timepieces, rare books and documents. The originator of the collection, Bert Degenaar, has had a long-standing relationship with the Royal Eise Eisinga Planetarium. That charming house has a 1774 orrery built into the ceiling of the living room. When Degenaar restored the Zuylenberg country house, he wanted to pay homage to Eise Eisinga's work, while also leaving something lasting at the location. What better than a contemporary in-house planetarium!

The Planetarium Zuylenburgh was constructed by Pieter Jan de Ruiter. The ceiling and room panelling are finished in duck-egg blue. A clock movement concealed within a matching panelled cabinet drives the mechanism. While Eisinga's drive work is housed in a tallish space (see their web site), the Zuylenberg orrery mechanism is ultra-flat, concealed in a narrow space just a few inches deep. For full remedial access, a large part of the ceiling can be swung downward as shown in the inset photos on the rear cover. There is a specially built winch, and all the hardware was purpose built just like the clock. The refined craftsmanship of the mostly-wooden orrery mechanism is a delight, a true exercise of balance in restraint and perfect function.



