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News

The seven suns of Rome

A diagram lost for more than 350 years documents a spectacular sky of 1630.

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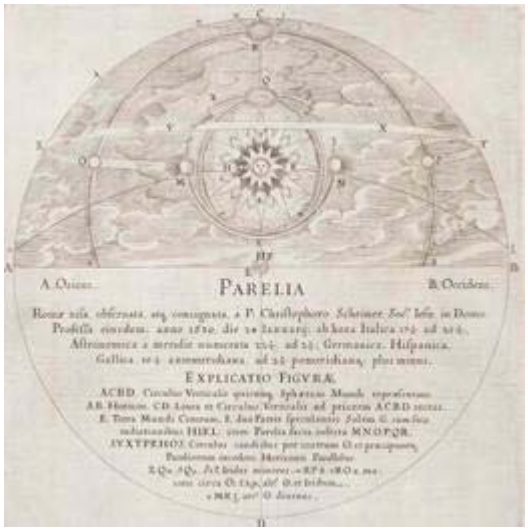
Around midday on 24 January 1630, seven suns seemed to blaze over Rome. Many onlookers took the phenomenon as a celestial omen of good or ill fortune, but an adherent of the scientific revolution also took note of the kaleidoscopic sky.



A print of a diagram that was feared lost details the astonishing halo effects seen over Rome in 1630.

Herzog August Bibliothek Wolfenbüttel: (Graph. C 707)

Jesuit scholar Christoph Scheiner recorded the phenomenon, along with a similar one seen ten months earlier. His work helped to inspire seventeenth-century Dutch astronomer and philosopher Christiaan Huygens to develop the first theories of how such 'halo effects' might arise naturally, but the 1630 diagram was thought to have been lost. A librarian in Germany has now uncovered what seems to be a copy of the picture, and reports the find in *Applied Optics*[1].

Halo effects are caused by particles of ice in the atmosphere refracting and reflecting light, and they often manifest as rings, circles or arcs around the Sun or Moon. Sometimes 'mock suns' known as parhelia appear at certain points along the rings. This is what Scheiner recorded in 1629 and 1630, although he didn't know the cause.

Scheiner's letters and diagrams depicting the halos passed among his contemporaries for interpretation, influencing luminaries such as French philosopher and mathematician René Descartes to try to explain similar atmospheric phenomena. But the originals of both diagrams had vanished by 1658, when Huygens came to the subject. He worked from a book by French astronomer Pierre Gassendi, which included a copy of the 1629 diagram and a written description of the 1630 display. Huygens drew his own reconstruction of the 1630 diagram.

Lost and found

For centuries, Huygens's reconstruction was the earliest known diagram of the 1630 halos. In the 1890s, an original print of Scheiner's picture surfaced at the Munich University Library in Germany — only to be destroyed when bombs hit the building in 1943.

But earlier this year, Eva Seidenfaden, scientific librarian at the Trier Municipal Library in Germany, was browsing the digitized collection of Herzog August Library in Wolfenbüttel, Germany, when she spotted an intriguing **halo diagram** in the Herzog archives. She recognized the picture's Latin caption from her research into the subject[2] with Walter Tape, a retired mathematician at the University of Alaska Fairbanks, and Günther Können, former head of climate

analysis at the Royal Netherlands Meteorological Institute in De Bilt.

Seidenfaden alerted Tape, who used the surviving Munich University Library records to confirm that it was a copy of the same diagram. The find "was a stunning surprise", says Tape.

Fokko Jan Dijksterhuis, a historian of science at the University of Twente in the Netherlands, says that the diagram is particularly interesting "because it concerns one of the first well recorded observations of halos. Consequently it adds not only to our historical knowledge, but also to our scientific body of knowledge". He compares it to finding old astronomical or meteorological data, crucial for reconstructing the past.

Making a preliminary comparison between the Scheiner and Huygens diagrams, Können says, "The halo displays on the two diagrams are very close — there are no halos in the original that are missed in Huygens's reconstruction." This is not so surprising, he adds, given that Scheiner was meticulous in his description.

In her announcement of the find[1], Seidenfaden proposes that more of Scheiner's work might be uncovered by tracing how the diagram made its way to the Herzog library. She says that there is even a possibility, albeit remote, that further investigation might turn up a draft of Scheiner's own interpretation of his observations.

References

1. Seidenfaden, E. *Appl. Opt.* **50,** F60-F63 (2011). | **Article** |
2. Tape, W., Seidenfaden, E. & Können, G. P. *Appl. Opt.* **47,** H72-H84 (2008). | **Article** |

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