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‘A Vitious Way of Observing’: A New History of the Personal Equation

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One Bad Boss Sets Both Psychology and Astronomy Back 25 Years – 212 Years After His Death, He is Still Defended

Abstract

David Kinnebrook is only known today as the assistant to the Astronomer Royal dismissed for marking stellar transits too slowly. Kinnebrook’s firing is commonly listed as the impetus for the personal equation as well as empirical psychology. Historians drawing their accounts from Nevil Maskelyne’s remarks on the dismissal, view Kinnebrook as a slightly misused, though mute, party in the affair. Kinnebrook’s letters, which resurfaced in 1985, present his side of the story. While scholars have discussed some aspects of the letters, they have not addressed Kinnebrook’s account of a months-long dispute with Maskelyne concerning observational disagreements. Kinnebrook’s letters provide an account of individual differences, observational practice, and Maskelyne’s failure to comprehend the problem. Had Maskelyne taken his assistant’s perspective seriously, the personal equation phenomenon might have been discovered 20 years earlier than it was.

“A story that hails a hero must also hiss at a villain – in this case, the Reverend Nevil Maskelyne...” (Sobel 1995, 111)



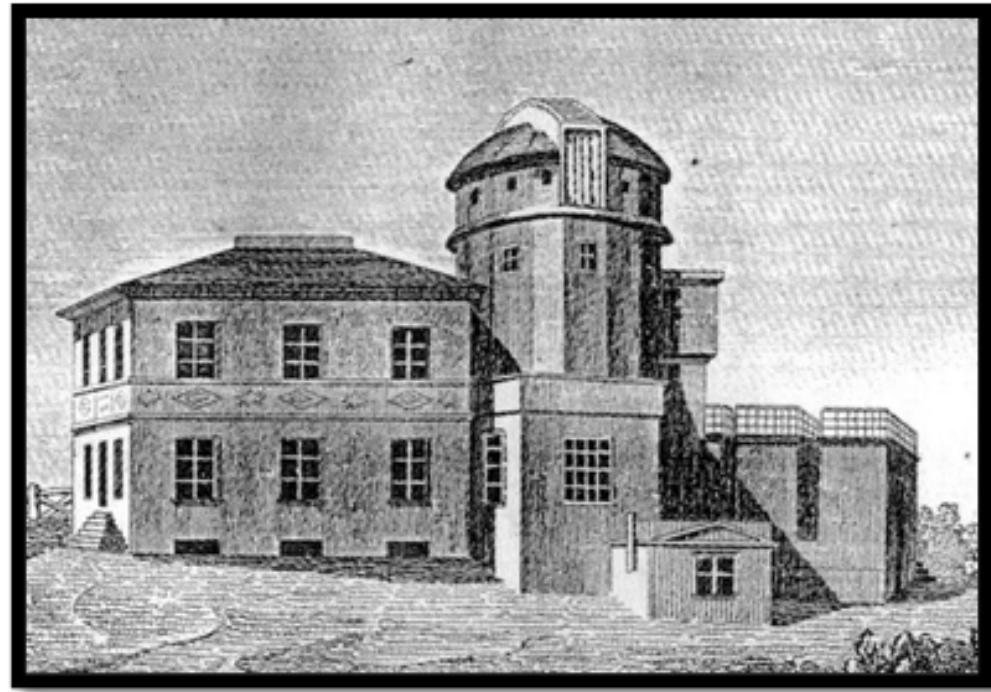
The Reverend Nevil Maskelyne (1732-1811), Astronomer Royal
1785, by Gerard van der Puyt [RS.9716]



Bessel’s Discovery of Individual Constant Differences (1823) – Precursor of the Personal Equation



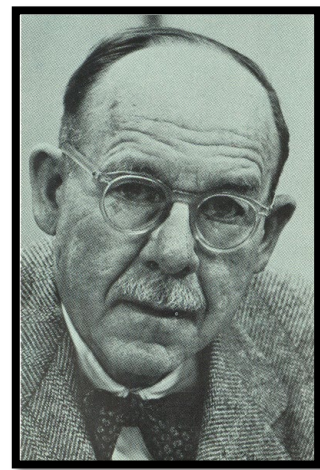
Friedrich Wilhelm Bessel (1784-1846)



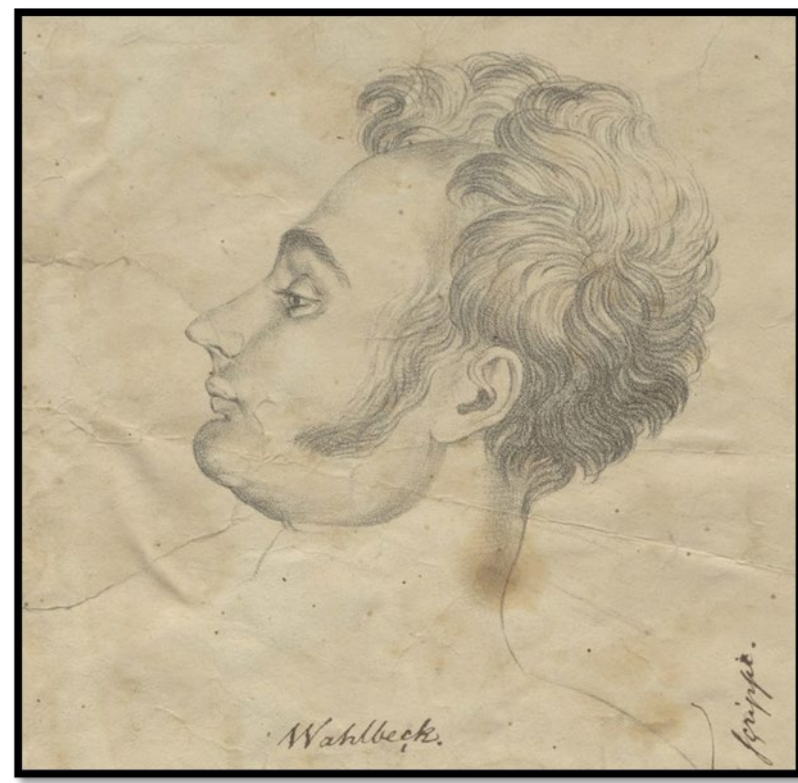
Königsberg Observatory

Bessel’s intense project of error reduction revolutionized positional astronomy. Though initially opposed to the possibility that two observers could differ substantially, Bessel eventually set up comparative observational tests, first with Walbeck, and then with his student Argelander. **The results were shocking: observers could routinely differ in more than 1 second in their marking of the time a celestial body crossed a spider wire in a transit telescope – Kinnebrook was fired for simply being human or for differing from his boss, which is the same thing.**

Empirical Psychology came to see Kinnebrook’s firing as its founding event: “At Greenwich in 1796 Maskelyne, as every psychologist knows, dismissed Kinnebrook, his assistant, because Kinnebrook observed the times of stellar transits almost a second later than he did.” (Boring 1929, 133)



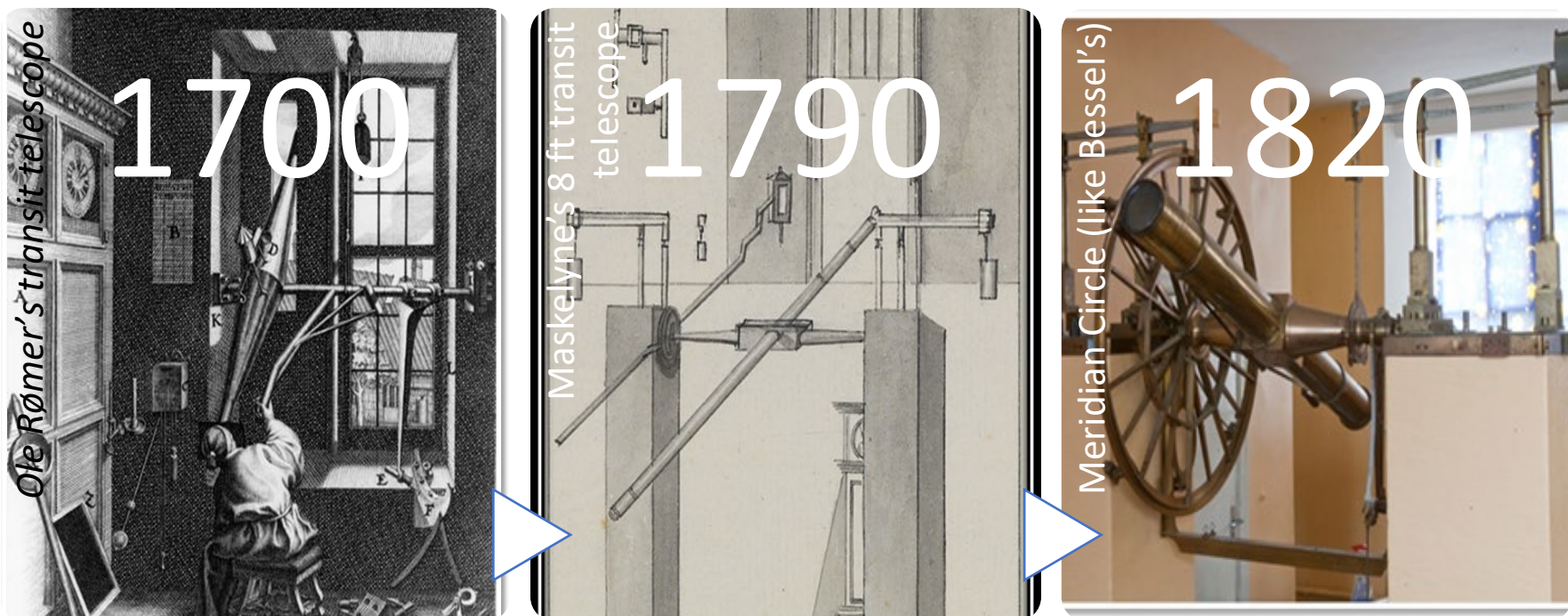
Edwin G. Boring (1886-1968)



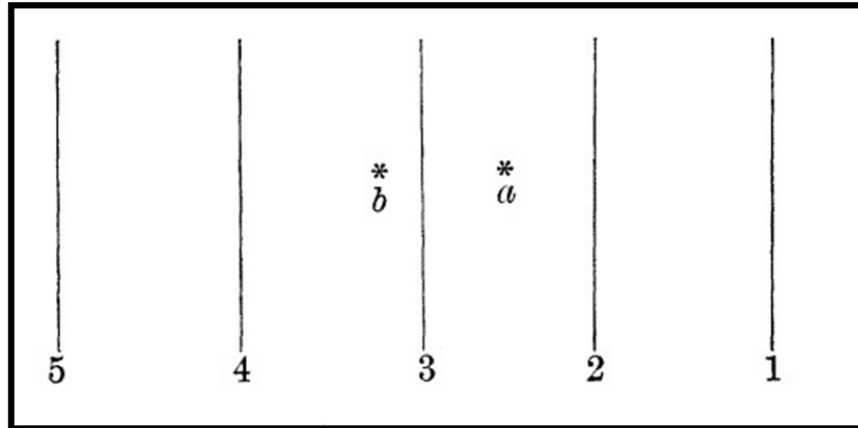
Henrik Johan Walbeck (1793-1822)
drawing by G.W. Finnberg

Transit Observations – Critical to Positional Astronomy and Navigation

As transit telescopes were progressively improved, accuracy improved. Eventually, they became so accurate that new sources of inaccuracy could be discovered, including observational differences of different observers.

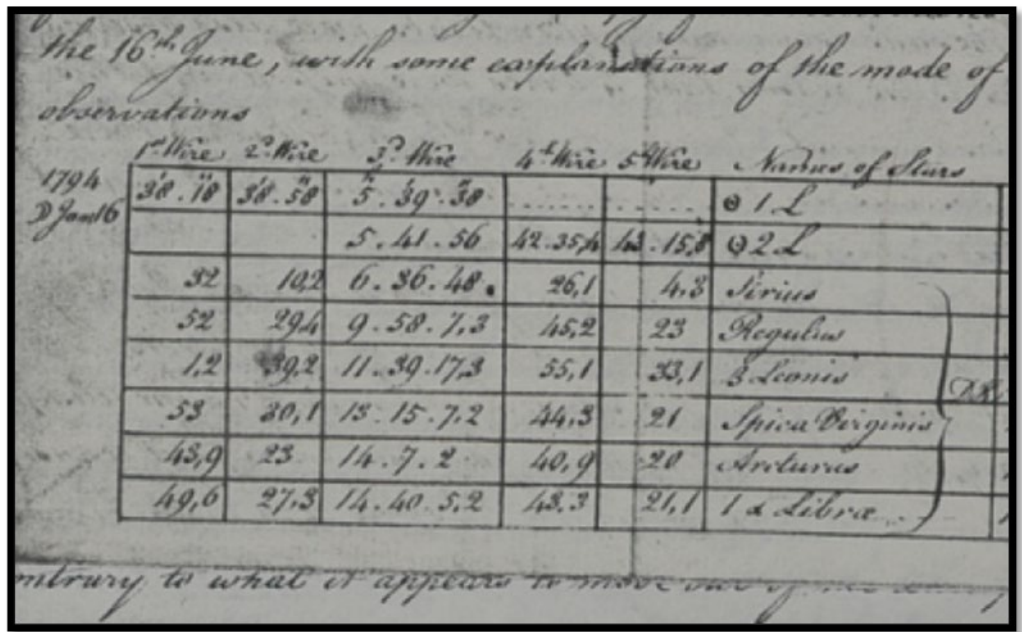


View from One Tree Hill: The Queen’s House and the Royal Observatory, Greenwich by Jan Griffier



The view through a transit instrument’s spider wires (Sanford, 1888-89)

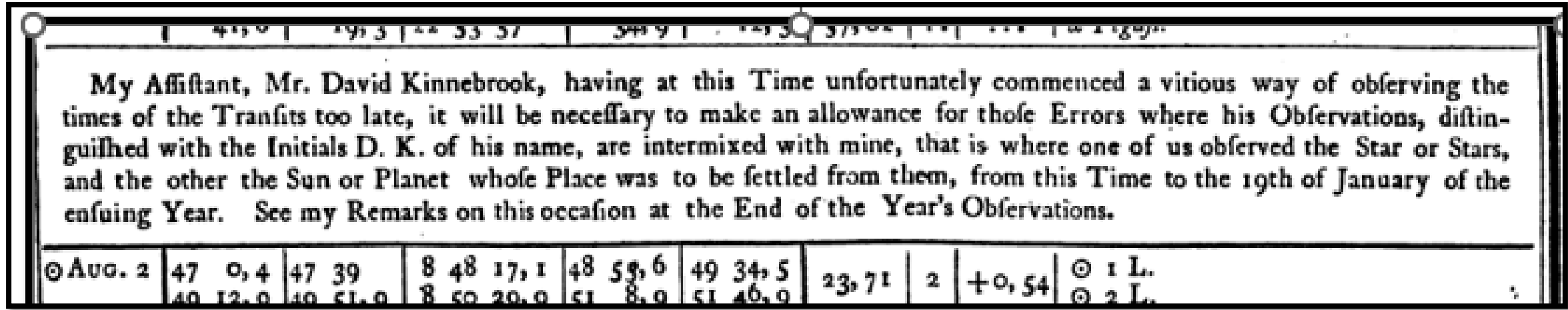
David Kinnebrook Jr., Maskelyne’s assistant, was fired in 1796 for having “unfortunately commenced a vitious way of observing the Transits too late...” Maskelyne announced Kinnebrook’s dismissal when his observations were published in 1799. By 1802, Kinnebrook’s short and unhappy life was over, no thanks to the disgrace of having been fired.



Kinnebrook’s hand-written observations, 1794



Maskelyne’s “observing suit”



Maskelyne on Kinnebrook’s dismissal (1799, 319)

Maskelyne – Darling of the Standard Narrative

Dava Sobel’s *Longitude* (1995) cast Maskelyne as a hypocritical ogre and the historical establishment took exception. Historians of the Royal Observatory and the Royal Society have defended Maskelyne against accusations that he was a “self-seeking academic astronomer with a less-than-personable style”. (Croarken 2014) When Kinnebrook’s letters to his father resurfaced in 1985, Sobel’s portrait of Maskelyne as a boorish villain was enhanced. The letters show that Maskelyne was a petulant, petty, control freak – even to the point where he tried to marry Kinnebrook off to a “Mrs. Wilkinson”, the niece of one of Maskelyne’s astronomer friends. Mollon and Perkins (the latter the archivist for the Royal Greenwich Observatory Archives) published an article in *Nature* (1996) that acknowledged the poor treatment Kinnebrook received at Maskelyne’s hands. However, they then exonerated Maskelyne on the observational side and condemned Kinnebrook as a poor observer. Mollon and Perkins pointed out Kinnebrook’s preference for certain final digits, his higher rate of dispersion, and his increasing tendency to round observations to whole seconds. They concluded: “Certainly, Kinnebrook was not a distinguished observer. The pretext for his dismissal was sound, although the real reason for his dismissal may not be the one historically assumed.” – **Interestingly, for all their 20th century statistical analysis (all of it unknown in the 18th century) Mollon and Perkins never address Kinnebrook’s “lateness”, which was the stated reason for his dismissal. In fact, the constant magnitude of his lateness is actually inconsistent with all the statistical measures they put forward.**

Conclusion

Maskelyne simply reported Kinnebrook’s “vitious way of observing” without saying a word about Kinnebrook’s own position. Had Kinnebrook been treated with more respect, the perceptual relativity effects in astronomical observation might have been appreciated in 1796. Instead, Kinnebrook was fired, spent some unhappy years as an usher in a school, and died in 1802, at the age of 30.

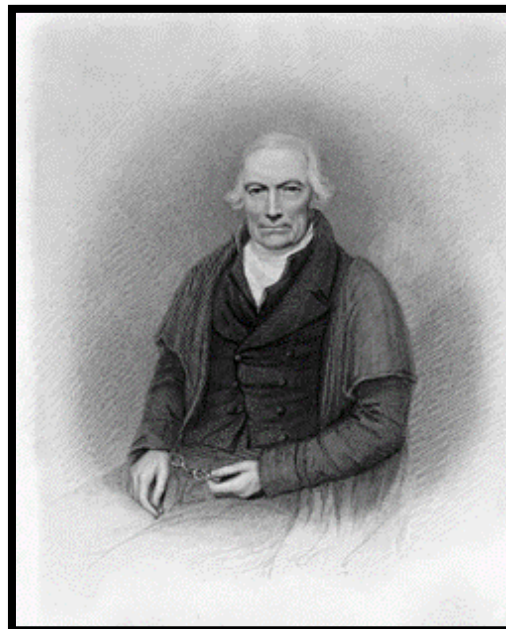
Kinnebrook ought to be remembered as the first person to conceive of individual constant differences.

Maskelyne, noted by Clerke as “fitted rather to continue a tradition than to found a school.” (1902, 28), should be remembered – so far as this story goes – as thick-headed, dismissive, and a bit free in claiming the work of a (disgraced) assistant as his own.

Kinnebrook Speaks

Scholars have given Maskelyne the last word on Kinnebrook. However, in his letters, Kinnebrook details the many defenses he made of his observational practice to Maskelyne.

- The letters show that Maskelyne passed off 6 weeks of observations of Kinnebrook’s as his own.
- Kinnebrook studied old observation logs and found that Maskelyne differed just as much with earlier assistants
- Kinnebrook expressed the rudiments of the constant difference thesis (later put forward by Bessel): “the observations made by the same person will agree better than those made by different persons.”
- The differences were known during the time of Kinnebrook’s employment to many outside the observatory, including Samuel Vince, who seems to have taken Kinnebrook’s side: “Mr. Vince said ... that if our observations did not agree with Dr. Maskelyne’s we had a majority against him.



The Reverend Samuel Vince (1749-1821)

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