

**Klaus Hentschel \***

## **Gauß, Meyerstein and Hanoverian precision weights and measures**

THE PRACTICE OF PRECISION WEIGHING as perfected by Carl Friedrich Gauß (1777–1855) and his instrument maker Moritz Meyerstein (1808–82) is portrayed by Klaus Hentschel on the basis of unpublished sources in the archive of Göttingen University and elsewhere.

In August 1836, a new law on weights and measures was issued at St. James's palace in London, soon followed by further instructions for the Hanoverian territory. The interior ministry, the Königlich-Großbritannisch-Hannoversches Ministerium des Innern, decreed that Gauß, already well-known for his meticulous geodetic measurements and other services to the British sovereign, develop new precision weights and measures. Among these were length and volume measures conformed to the new legal prescriptions from London. Gauß met this challenge in precision measurement in close collaboration with the university mechanic and machine inspector Meyerstein. After many trials and tribulations, they finally produced two copies of the new Hanoverian normal pound with an error margin of less than one thousandth gram, i.e., with a relative accuracy of roughly  $2 \times 10^{-6}$ . The many small innovations introduced by Meyerstein and Gauß in precision balance design and in the weighing procedures in order to reach this incredible precision will also be described in detail.<sup>1</sup>

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\* University of Berne, Berne, Switzerland; email: [Khentsc@aol.com](mailto:Khentsc@aol.com).

<sup>1</sup> For further information on Meyerstein, the reader is referred to Klaus Hentschel: *Gaussens unsichtbare Hand*. Göttingen 2005 (= *Abhandlungen der Göttinger Akademie der Wissenschaften*, math. phys. Klasse, Vol. No. 53), his paper on “[Gauß, Meyerstein and Hanoverian metrology](#)”, *Annals of Science*, vol. 64, Number 1 (2007), pp. 41–72, and to the url: <http://www.cx.unibe.ch/~khentsch/meyerst.html>.