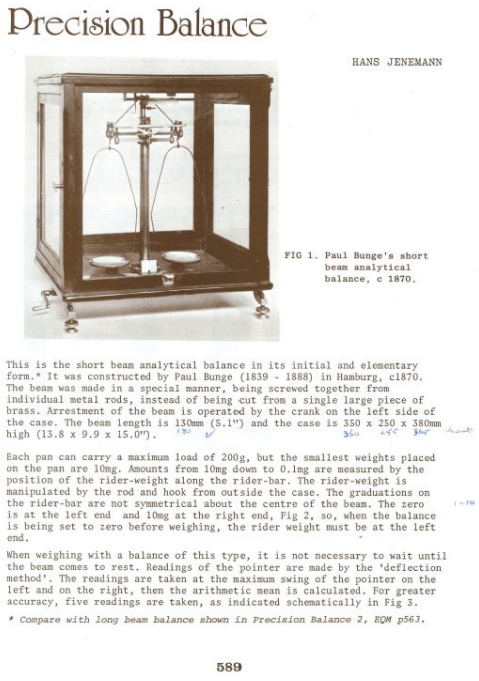

Precision Balance

HANS JENEMANN

FIG 1. Paul Bunge's short beam analytical balance, c 1870.

This is the short beam analytical balance in its initial and elementary form.* It was constructed by Paul Bunge (1839 - 1888) in Hamburg, c1870. The beam was made in a special manner, being screwed together from individual metal rods, instead of being cut from a single large piece of brass. Arrestment of the beam is operated by the crank on the left side of the case. The beam length is 130mm (5.1") and the case is 350 x 250 x 380mm high (13.8 x 9.9 x 15.0").

Each pan can carry a maximum load of 200g, but the smallest weights placed on the pan are 10mg. Amounts from 10mg down to 0.1mg are measured by the position of the rider-weight along the rider-bar. The rider-weight is manipulated by the rod and hook from outside the case. The graduations on the rider-bar are not symmetrical about the centre of the beam. The zero is at the left end and 10mg at the right end, Fig 2, so, when the balance is being set to zero before weighing, the rider weight must be at the left end.

When weighing with a balance of this type, it is not necessary to wait until the beam comes to rest. Readings of the pointer are made by the 'deflection method'. The readings are taken at the maximum swing of the pointer on the left and on the right, then the arithmetic mean is calculated. For greater accuracy, five readings are taken, as indicated schematically in Fig 3.

** Compare with long beam balance shown in Precision Balance 2, EQM p563.*

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Abstract

Remarks