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On Wheatstone's bridge

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The differences are not, in general, greater than those existing between the numbers calculated by Dulong and Petit from their formula and the observed numbers.

From the whole of these facts it appears to me to follow that, between 0° and 1775° , the law of radiation can be represented by the formula

$$I = mTbT^2\alpha T.$$

Comptes Rendus de l'Académie des Sciences, t. xcii. p. 1204.

ON WHEATSTONE'S BRIDGE. BY K. F. SLOTTE.

The length of the platinum wire belonging to this apparatus, which cannot be exactly determined by measurement, can, it is well known, be ascertained indirectly by comparing and exchanging resistances*. The following procedure is a modification of this method which may not be without advantages.

Let s be the length of the wire, a and b that of its two divisions when two resistances w_1 and w_2 are inserted and the galvanometer shows no current. Then is

$$\frac{w_1}{w_2} = \frac{a}{b} = \frac{s+a-b}{s-(a-b)} = \frac{s+d_1}{s-d_1}, \dots\dots\dots (1)$$

in which $a-b$ is put $= d_1$. If now the resistances w_1 and w_2 be exchanged and the movable contact shifted till again no current passes through the galvanometer, this displacement, taken as positive or negative according to whether a is more or less than b , is equal to d_1 , which quantity can be directly determined by reading it off upon the scale of the apparatus.

If in the same manner w_2 be compared with a third resistance w_3 , and, again, w_3 with w_1 , and if the displacements corresponding to d_1 be denoted respectively d_2 and d_3 , then we have

$$\frac{w_2^2}{w_3^2} = \frac{s+d_2}{s-d_2}, \dots\dots\dots (2)$$

$$\frac{w_3}{w_1} = \frac{s+d_3}{s-d_3}, \dots\dots\dots (3)$$

From (1), (2), and (3) we get

$$1 = \frac{(s+d_1)(s+d_2)(s+d_3)}{(s-d_1)(s-d_2)(s-d_3)},$$

and finally, by solving the last equation,

$$s = \sqrt{-\frac{d_1 d_2 d_3}{d_1 + d_2 + d_3}}. \dots\dots\dots (4)$$

Three determinations effected by this method, in which w_2 was chosen approximately equal to $\sqrt{w_1 w_3}$, gave for s the values 1118.11, 1118.75, 1118.6 millim.—Wiedemann's *Annalen*, 1882, no. 1, vol. xv. p. 176.

* See G. Wiedemann, *Galvanismus*, [2] i. p. 254.