axis at right angles to that of the suspended magnet in its deflected position, the axes of the two magnets being in the same horizontal plane, and the centre of the unifilar in the prolongation of the axis of the deflector.

Also let r be the distance between the magnetic centres,
u the angle of deflection,
X the horizontal component of the force.

The relation between m, r, u, and X is given by the formula

$$m = f(r) \text{ X} \sin u, \text{ (where } f(r) \text{ is some function of } r)$$

and that of their simultaneous small changes by

$$\frac{\Delta m}{m} = \frac{f'(r)}{f(r)} \Delta r + \cot u \, \Delta u + \frac{\Delta \text{X}}{\text{X}}$$

Now, if $\frac{\Delta m}{m}$ be the increase in the magnetic moment due to a decrease of $(t - t_0)$ in the temperature, and q that due to a decrease of 1°, so that $\frac{\Delta m}{m} = q\,(t - t_0)$, the preceding equation will become

$$q = \frac{1}{t - t_0} \left\{ \frac{f'(r)}{fr} \Delta r + \cot u \, \Delta u + \frac{\Delta \text{X}}{\text{X}} \right\}.$$

It is customary to assume that $\Delta r = 0$, or that the magnetic centre occupies a fixed position in the magnet during the changes of temperature. Such will probably be the case if the magnet be strictly homogeneous throughout ; but if its molecular condition be not uniform, it is at least conceivable that a change of temperature will affect differently the different parts of the magnet, as it is already known to affect the general magnetism of two different magnets.

Suppose, then, the north end of the deflector to be directed towards the suspended magnet, and that a decrease of 1° in temperature causes the magnetic centre to recede from the north end by the small quantity (α), so that $\Delta r = (t - t_0)\alpha$. Also, suppose q_1 to be the value of q determined in this case on the supposition that r is constant or that $\Delta r = 0$.

We shall then have

$$q = \frac{f'(r)}{f(r)} \alpha + q_1$$

Similarly, if q_2 be the value determined on the same hypothesis when the south end of the deflector is presented,