

terrestrial magnetism.* When this disturbance attains a great degree of intensity, the equilibrium of the distribution is restored by a discharge attended by a development of light. 'The Aurora† itself is, therefore, not to be regarded as an externally manifested cause of this disturbance, but rather as a result of telluric activity, manifested on the one side by the appearance of the light, and on the other by the vibrations of the magnetic needle.' The splendid appearance of colored polar light is the act of discharge, the termination of a magnetic storm, as in an electrical storm a development of light—the flash of lightning—indicates the restoration of the disturbed equilibrium in the distribution of the electricity. An electric storm is generally confined to a small space, beyond the limits of which the condition of the atmospheric electricity remains unchanged. A magnetic storm, on the other hand,

* [The Aurora Borealis of October 24th, 1847, which was one of the most brilliant ever known in this country, was preceded by great magnetic disturbance. On the 22d of October the maximum of the west declination was $23^{\circ} 10'$; on the 23d the position of the magnet was continually changing, and the extreme west declinations were between $22^{\circ} 44'$ and $23^{\circ} 37'$; on the night between the 23d and 24th of October, the changes of position were very large and very frequent, the magnet at times moving across the field so rapidly that a difficulty was experienced in following it. During the day of the 24th of October there was a constant change of position, but after midnight, when the Aurora began perceptibly to decline in brightness, the disturbance entirely ceased. The changes of position of the horizontal-force magnet were as large and as frequent as those of the declination magnet, but the vertical-force magnet was at no time so much affected as the other two instruments. See *On the Aurora Borealis, as it was seen on Sunday evening, October 24th, 1847, at Blackheath*, by James Glaisher, Esq., of the Royal Observatory, Greenwich, in the *London, Edinburgh, and Dublin Philos. Mag. and Journal of Science for Nov., 1847*. See further, *An Account of the Aurora Borealis of October the 24th, 1847*, by John H. Morgan, Esq. We must not omit to mention that magnetic disturbance is now registered by a photographic process: the self-registering photographic apparatus used for this purpose in the Observatory at Greenwich was designed by Mr. Brooke, and another ingenious instrument of this kind has been invented by Mr. F. Ronalds, of the Richmond Observatory.]—*Tr.*

† Dove, in Poggend., *Annalen*, bd. xx., s. 341; bd. xix., s. 388. "The declination needle acts in very nearly the same way as an atmospheric electrometer, whose divergence in like manner shows the increased tension of the electricity before this has become so great as to yield a spark." See, also, the excellent observations of Professor Kämtz, in his *Lehrbuch der Meteorologie*, bd. iii., s. 511–519, and Sir David Brewster, in his *Treatise on Magnetism*, p. 280. Regarding the magnetic properties of the galvanic flame, or luminous arch from a Bunsen's carbon and zinc battery, see Casselmann's *Beobachtungen* (Marburg, 1844), s. 56–62.