

The line along which the *inclination* of the needle from the horizon is the same as at York (isoclinal line), runs on the average to the east of north $70^{\circ} 31'$; and there is an interval of 1.72 geographical mile between two isoclinal lines, along which the inclination differs one minute of a degree. Between the south-eastern and north-western extremities of the county, the inclination of the needle varies about 50 minutes of a degree.

On the average, as before observed, the isoclinal lines cross the meridian lines in Yorkshire at angles of $70^{\circ} 31'$ and $109^{\circ} 29'$, but they are not free from twists and irregularities depending on the nature of the rocks and the masses of land. I find a systematic arrangement of these local deviations from the general direction of the isoclinal lines. They appear to bend southward in crossing the great Vale of York, and to turn up to the northward on the hilly districts which rise to the east and to the west.

The *force* with which the magnetic needle is retained in the position which it occupies is found to vary in different parts of the country, and to increase toward the north-west. It is greater at York than at London, in the proportion of 1.0114 to 1.0000. The line along which the force is equal (isodynamic line) crosses the meridian in Yorkshire at an angle of $63^{\circ} 51'$ to the east of north; and for a change in this force amounting to $\frac{1}{100}$ th part, we must pass to the north-west about 84.4 geographical miles*.

* The results of my observations were first given by Col. Sabine in the "Magnetic Survey of the British Islands." (Reports of British Association for 1838.) I have since repeated them at many stations, and the general conclusions will appear in the next Part of the Proceedings of the Yorkshire Philosophical Society. The lines in Yorkshire pass, on the whole, more nearly east and west than in other parts of the island.