

fore we can be supplied with the data necessary to determine the law which governs the annual change of variation. It is stated by the author of *Magnetism*, in the *Library of Useful Knowledge*, from a table given by Mr. Gilpin in the *Philosophical Transactions*, that the amount of annual change has been continually decreasing from the commencement of the eighteenth century. From 1622 to 1773, it was only 8'; from 1787 to 1795, it was 5'; from that time to 1802 only 1' 2"; in 1818, it was reduced to zero. The law which governs these changes may be determined when a more extensive series of observation has been made.

#### DIURNAL CHANGE IN THE VARIATION.

The magnet is subject to a diurnal as well as an annual change of the variation. This was discovered by Graham, in the year 1772, the greatest westerly variation happening, as he supposed, about noon and the four following hours, the least about seven in the evening. More accurate observations were afterward made by other experimenters, and it has been found that the motion is much more complex than was at first imagined. Commencing our observations at about seven or half past seven o'clock in the morning, we observed the needle to have a slight westerly motion, which continues till about two o'clock in the afternoon. The direction of the motion is then changed, and the needle slowly retrogrades, and returns to the eastward until evening; it then again takes a westerly direction, returning again during the night or early in the morning. Its maximum easterly direction is about seven o'clock in the morning. This daily change of variation amounts, at some periods of the year, to fourteen or fifteen minutes, and is greater during the summer than the winter months, but experimenters are undecided as to the month in which it is greatest. Canton and Wargentin thought its maximum to be in the month of July; but, according to Colonel Beaufoy's experiments, it is greatest in June and August, and in this gentleman's results we may place great dependance, from his known accuracy, as well as from the time he continued to observe this phenomenon.

From the moment that the diurnal change in the variation was observed, it has been a favourite supposition that it has its origin in the action of solar heat; but it is only since Oersted's ever memorable experiments upon the influence of