Some Observations on the Formation of Mists in particular Situations. *By Sir* H. Davy, *Bart. F.R.S. V.P.R.I.* Read February 25, 1819. [*Phil. Trans.* 1819, *p.* 123.]

The author shows, in this paper, that after sunset the fall of temperature that ensues upon the earth's surface is considerably greater on land than in water, and refers to the well-known peculiarity in the expansibility of water, at temperatures below 40°, for the cause of its superior temperature and that of the air above it. When, therefore, the cold and comparatively dry air of the land mixes with the warmer and damper air that rests upon the water, the diminution of the temperature of the latter, occasioned by this mixture, tends to separate a portion of its moisture, and consequently to produce mist.

Observations on the Dip and Variation of the Magnetic Needle, and on the Intensity of the Magnetic Force; made during the late Voyage in search of a North-west Passage. *By Captain* Edward Sabine, *of the Royal Regiment of Artillery, F.R.S. and F.L.S.* Read February 25, 1819. [*Phil. Trans.* 1819, *p.* 132.]

The dipping-needle used in these observations was similar to that described by Mr. Cavendish in the 66th volume of the Philosophical Transactions, and was made by the same artist. It was so adjusted that no alteration took place in the indication of the dip on reversing the poles, and was placed in the direction of the magnetic meridian by a compass stationed at a sufficient distance, and suffered to remain during the observations, for the purpose of occasional verification.

In determining the intensity of the magnetic force, the needle was drawn to a horizontal position by a magnet, and, being released at an observed moment of time, was suffered to oscillate until the arcs became too small to be readily distinguished: the first arc was thus equal to the dip, and at every tenth vibration both the arc and time were noted. The results of these observations are given in a series of tables.

The azimuth compasses used in the observations to determine the variation of the needle in Davis's Strait and Baffin's Bay, and the results of which are detailed in tables annexed to this paper, were constructed upon Captain Kater's improved plan. They were generally employed on the ice; for as the influence of the ship's iron increased upon their compasses as the directive power of magnetism diminished, the observations made on board became of little or no value towards a knowledge of the true variation. This remark Captain Sabine illustrates by the insertion in his tables of a few azimuths taken in the Isabella. They also show how essential it is to navigation, in high latitudes, that the nature of the errors which the ship's attraction produces on her compasses should be understood.