been unable, for want of a sufficient number of specimens of water taken at various depths in the Mediterranean, to draw any certain inference as to what becomes of the vast amount of salt brought into that sea by the constant current which sets in from the Atlantic through the Straits of Gibraltar, and which, on the evaporation of the water, must either remain in the basin of the Mediterranean, or escape by some hitherto unexplained means. In the hope of obtaining further evidence on this question, he had requested Captain Smyth, R.N., who was engaged in a Survey of that sea, to procure specimens of water from the greatest accessible depths. The specimens collected by Captain Smyth were, in consequence of Dr. Marcet's death, given to other persons, and applied to other objects. Dr. Wollaston, however, fortunately obtained the three remaining bottles of the collection.

The contents of one of these, taken up at about fifty miles within the Straits, and from a depth of 670 fathoms, was found to have a density exceeding that of distilled water by more than four times the usual excess; and accordingly, it left upon evaporation more than four times the usual quantity of saline residuum. The result of the examination of this specimen accords completely with the anticipation, that a counter current of denser water might exist at great depths in the neighbourhood of the Straits, capable of carrying westward into the Atlantic as much salt as enters into the Mediterranean with the eastward current near the surface. If the two currents were of equal breadth and depth, the velocity of the lower current need only be one fourth of that of the upper current, in order to prevent any increase of saltness in the Mediterranean.

An Account of the preliminary Experiments and ultimate Construction of a Refracting Telescope of 7·8 *inches aperture, with a fluid concave Lens. In a Letter addressed to* Davies Gilbert, *Esq. P.R.S. By* Peter Barlow, *Esq. F.R.S. &c.* Read December 18, 1828. [*Phil. Trans.* 1829, *p.* 33.]

The author gives an account of the continuation of his experiments on the construction of refracting telescopes with fluid lenses, which the aid furnished him by the Board of Longitude enabled him to pursue. The instrument he particularly describes has a clear aperture of 7·8 inches, which exceeds by about an inch that of the largest refracting telescope in this country. The whole length of the tube, with the eye-piece, is 12 feet, but its effective focus is 18 feet. It carries a power of 700 on the closest double stars in South's and Herschel's catalogue, and shows them round and defined. This telescope is mounted on a revolving stand, which works with considerable accuracy as an azimuth and altitude instrument. The weight of the stand is about 400 pounds, and that of the telescope 130 pounds, being purposely made heavy in order to obtain steadiness; yet its motions are so smooth, and the power so arranged, as to be easily manageable by one person; and the star may be followed by a slight

touch of the apparatus for regulating the more delicate movements of the telescope.

In order to protect it from the weather, which was found to injure its action and derange its adjustments, the author erected an observatory to contain it, consisting of a light piece of carpentry, 16 feet in diameter, with a revolving conical roof rising 9 feet above the walls, containing about 360 square feet of surface, and weighing about 10 cwt. It is moveable by a simple apparatus, made to revolve and open to any required azimuth, by the application of a force of about 10 or 12 pounds.

His first object in the preliminary experiments was to ascertain the best position of the lenses for diminishing as much as possible the secondary spectrum. For this purpose he reverts to the formulæ given in a preceding paper, whence he deduces equations applicable to this object. The mode of constructing different parts of the telescope is then particularly described, especially that of the fluid lenses, and of effecting the proper centering, and other adjustments. He then describes its power when applied to several double stars. By its means η Persei, marked as a treble star in South's and Herschel's catalogue, is seen distinctly sextuple; four of the smaller of these stars, together with a larger one, form a miniature representation of Jupiter and his satellites. Of the planets, he has only had opportunities of trying the telescope on Venus, Saturn, and Mars, all of which appear with remarkable brightness and distinctness. The moon is also remarkably beautiful; every minute distinction of figure and shade being brought into view.—The paper concludes with a detailed description of the various parts of the telescope and stand, illustrated by a drawing.

On the Dip of the Magnetic Needle in London, in August, 1828. *By Captain* Edward Sabine, *of the Royal Artillery, Sec. R.S.* Read January 8, 1829. [*Phil. Trans.* 1829, *p.* 47.]

This paper commences by noticing that the Philosophical Transactions contain the record of observations on the dip of the needle in London, from the early part of the last century to the present time. That these observations all concur in showing a progressive decrease of the dip during the whole period in question, but that they are insufficient in number and frequency, and the earlier ones particularly, in the required accuracy to enable us to determine whether the annual decrease has been uniform or otherwise.

The author having taken much pains to obtain a correct determination of the dip in the Regent's Park, in August 1821 (published in the Philosophical Transactions for 1822), repeated his observations in August 1828, at the expiration of seven years from the former determination; an interval which he considered sufficient to throw light on the rate at which the dip is at present diminishing. In consequence of the increase of buildings in the Regent's Park, he was induced to change the place of observation to the Horticultural So