bored through with a taper-bore, and a basket may be used at the bottom of the pump instead of the box colander.

*On the Motion of Light. By M. Romer.** N° 136, p. 893.

Philosophers have been endeavouring for many years to decide, by some experiment, whether the action of light be conveyed in an instant to distant places, or whether it requires time. M. Romer of the Royal Academy of Sciences has devised a way for this purpose, taken from the observations of the first satellite of Jupiter, by which he demonstrates, that for the distance of about 3000 leagues, which is nearly equal to the diameter of the earth, light needs not one second of time.

Let A (fig. 13, pl. 11) be the sun, B Jupiter, C the first satellite of Jupiter, which enters into the shadow of Jupiter, to come out of it at D; and let EFGHLK be the earth placed at divers distances from Jupiter.—Now suppose the earth being at L, towards the second quadrature of Jupiter, has seen the first satellite at the time of its emersion or issuing out of the shadow at D; and that about 42½ hours after, viz. after one revolution of this satellite, the earth being in K, see it returned to D; it is manifest, that if the light require time to traverse the interval LK, the satellite will be seen returned later to D, than it would have been if the earth had remained at L; so that the revolution of this satellite being thus observed by the emersions, will be retarded by so much time, as the light shall have taken in passing from L to K; and that on the contrary, in the other quadrature FG, where the earth by approaching goes to

* Olaus Romer, or Roemer, a noted Danish astronomer and mathematician, was born at Arhusen in Jutland, 1644. Having acquired great skill in those sciences, when M. Picard was sent by Louis XIV to make observations in the north, in 1671, he was so much pleased with this young man, that he engaged him to return with him into France, where the king settled a pension on him, and honoured him with the appointment of mathematical preceptor to the Dauphin: he was also joined with Picard and Cassini, in making astronomical observations; and in 1672 he was admitted a Member of the Academy of Sciences. During the ten years he resided at Paris, he acquired great reputation by his discoveries, and among them that above noticed, concerning the progressive motion of light. Yet it is said he complained afterwards, that his coadjutors ran away with the honour of many things that belonged to him. Probably this induced him to return into his own country, which he did in 1681, where he was appointed to the office of mathematician to the King, and astronomical professor, with a large salary. He afterwards was honoured with several other offices of dignity, particularly that of counsellor of state, and burgomaster of Copenhagen. Roemer was preparing to publish the result of his observations when he died, in 1710, at 66 years of age. This loss however was supplied by his pupil, Peter Horrebow, professor of astronomy at Copenhagen, who published them, with his method of observing, in 1735, under the title of Basis Astronomicæ. Several of his pieces were also printed in the Memoirs of the Academy of Sciences at Paris, particularly in vol. i and x of the collection of 1666.

meet the light, the revolutions of the immersions will appear to be shortened by so much as those of the emersions had appeared to be lengthened. And because in 42½ hours, which this satellite very near takes to make one revolution, the distance between the earth and Jupiter in both the quadratures varies at least 210 diameters of the earth, it follows that if for the account of every diameter of the earth there were required a second of time, the light would take 3½ minutes for each of the intervals GF, KL; which would cause near half a quarter of an hour between two revolutions of the first satellite, one observed in FG, and the other in KL; whereas there is not observed any sensible difference.

Yet it does not follow hence that light requires no time. For after M. Romer had examined the thing more nearly, he found that what was not sensible in two revolutions, became very considerable in many being taken together, and that for example, 40 revolutions observed on the side F, might be sensibly shorter than 40 others observed in any place of the Zodiac where Jupiter may be met with; and that in proportion of 22 for the whole interval of HE, which is the double of the interval that is from the earth to the sun.

The necessity of this new equation of the retardment of light is established by all the observations that have been made in the Royal Academy, and in the Observatory, for the space of 8 years; and it has been lately confirmed by the emersion of the first satellite observed at Paris, the 9th of November last, at 5 o'clock, $35^m\ 45^s$ at night, 10 minutes later than it was to be expected, by deducing it from those that had been observed in the month of August, when the earth was much nearer to Jupiter: which M. Romer had predicted to the said academy from the beginning of September.

Of Damps in Mines. By Mr. Roger Moslyn. N° 136, p. 895.

The coal work at Moslyn, in Flintshire, lies in a large parcel of wood-land, which has a great fall to the sea side, which is directly north. The dipping or fall of the several rocks or quarries of stone that are above the coal, and consequently of the coal lying under them, partly crosses the fall of the ground, so that the dipping of it falls within a point or less of due east; and the stratum runs, in some 40, in others 50, or even 60 yards under the level of the sea. This work is on a coal of 5 yards in thickness, and has been worked about 36 or 38 years. When first found it was very full of water, so that it could not be wrought down to the bottom of the coal. But a witchet or cave was driven out in the middle of it on a level, for gaining room to work, and drawing down the spring of water that lies in the coal, to the eye of the pit. In the driving of which witchet, after they had gone a considerable way under ground, and were