

Snow on the 25th; then Rain, which continued in the Month of

*October* during the 9 first Days; the rest of the Month was Cloudy, with now and then Hoar-Frosts, and some Fair. The Winds varied often, but were the most frequent in some of the Southerly and Westerly Points, and not very high.

In *November* the Winds were sometimes in the Westerly and Southerly Points, but more frequent in the Northerly and Easterly, for the most part of a moderate Strength. The 9 first Days the Weather was Cloudy, then Snow and Frost to the 17th; then to the End Cloudy, Snow, Hoar-Frost, Rain, and but little Fair, and that in the Morning.

In *December* the Winds were moderate, and often in the Southerly and S W. Points, seldom North-erly. The 5 first Days were Cloudy and Wet; then Snow and Frost the 6th, 7th, and 8th; then Cloudy to the 13th; then Hoar-Frost, and Fair on the 14th, 15th, and 16th; then Cloudy, with Thunder, Rain, Snow, and Frost, at diverse times, in the rest of the Month.

III. *An Account of the damp Air in a Coal-Pit of Sir James Lowther, Bart. sunk within 20 Yards of the Sea; communicated by him to the Royal Society.*

SIR *James Lowther* having Occasion to sink a Pit very near the full Sea-Mark, for the draining one of his principal Collieries near *Whitehaven*, in the County of *Cumberland*, which was known would

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be near 80 Fathom in Depth to the best Seam of Coals, which is three Yards thick ; the Work was carried on Day and Night very successfully, through several Beds of hard Stone, Coal, and other Minerals, 'till the Pit was sunk down 42 Fathom from the Surface, where they came to a Bed of Black Stone, about six Inches thick, very full of Joints, or open Cliffs, which divided the Stones into Pieces of about six Inches Square, the Sides whereof were all spangled with Sulphur, and in Colour like Gold. Under this Black-Stone lies a Bed of Coal two Foot thick: When the Workmen first prick'd the Black-Stone Bed, which was on the rise Side of the Pit, it afforded very little Water, contrary to what was expected ; but instead thereof a vast Quantity of damp corrupted Air, which bubbled through a Quantity of Water, then spread over that part of the Pit, and made a great hissing Noise ; at which the Workmen being somewhat surpriz'd, held a Candle towards it, and it immediately took Fire upon the Surface of the Water, and burn'd very fiercely ; the Flame being about half a Yard in Diameter, and near two Yards high, which frightened the Workmen so that they took the Rope, and went up the Pit, having first extinguished the Flame, by beating it out with their Hats ; the Steward of the Works being made acquainted with it, went down the Pit with one of the Men, and holding a Candle to the same Place, it immediately took Fire again, as before, and burnt about the same Bigness ; the Flame being blue at the Bottom, and more white towards the Top. They suffer'd it to burn near half an Hour, and no Water being drawn in that time, it rose and cover'd the Bottom of the Pit near a Yard deep, but

but that did very little abate the Violence or Bulk of the Flame, it still continuing to burn upon the Surface of the Water. They then extinguished the Flame as before, and opened the Black-Stone Bed near two Foot broad, that a greater Quantity of Air might issue forth, and then fired it again; it burn'd a full Yard in Diameter, and about three Yards high, which soon heated the Pit to so great a Degree, that the Men were in Danger of being stifled, and so were as expeditious as possible in extinguishing the Flame, which was then too strong to be beaten out with their Hats; but with the Assistance of a Spout of Water, of four Inches Diameter, let down from a Cistern above, they happily got it extinguished without further Harm. After this no Candles were suffered to come near it, 'till the Pit was sunk down quite through the Bed of Black Stone, and the two Foot Coal underneath it, and all that part of the Pit, for four or five Foot high, was fram'd quite round, and very close jointed, so as to repel the damp Air, which nevertheless, it was apprehended, would break out in some other adjoining part, unless it was carried quite off as soon as produced out of the Cliffs of the Stone; for which End a small Hollow was left behind the Framing, in order to collect all the damp Air into one Side of the Pit, where a Tube, of about two Inches Square, was closely fixed, one End of it into the Hollow behind the Framing, and the other carried up into the open Air, four Yards above the Top of the Pit; and through this Tube the said damp Air has ever since discharged itself, without being sensibly diminished in its Strength, or lessened in its Quantity, since it was first opened, which is now two Years, and nine Months ago: It is  
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just the same in Summer as in Winter, and will fill a large Bladder in a few Seconds, by placing a Funnel at the Top of the Tube, with the small End of it put into the Neck of the Bladder, and kept close with one's Hand.

The said Air being put into a Bladder, as is above described, and tied close, may be carried away, and kept some Days, and being afterwards pressed gently thro' a small Pipe into the Flame of a Candle, will take Fire, and burn at the End of the Pipe as long as the Bladder is gently pressed to feed the Flame, and when taken from the Candle, after it is so lighted, it will continue burning 'till there is no more Air left in the Bladder to supply the Flame. This succeeded in *May* last before the *Royal Society*, after the Air had been confined in the Bladder for near a Month.

The Air, when it comes out at the Top of the Tube, is as cold as Frosty Air.

It is to be observed that this sort of Vapour, or damp Air, will not take Fire except by Flame; Sparks do not affect it, and for that Reason it is frequent to use Flint and Steel in Places affected with this sort of Damp, which will give a glimmering Light; that is a great Help to the Workmen in difficult Cases.

After the damp Air was carried up in a Tube, in the Manner above describ'd, the Pit was no more annoy'd with it, but was sunk down very successfully through the several Beds of Stone and Coal, without any other Accident, or Interruption, 'till it came to the main Seam of Coals, which is three Yards thick, and 79 Fathom deep from the Surface; and the said Pit being Oval, *viz.* ten Foot one way, and eight the other,  
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it serves both for draining the Water by a Fire-Engine, and also for raising the Coals.

*Whitehaven, Aug. 1,*  
1733.

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IV. *An Observation of the Eclipse of the Sun on May 2, 1733, in the Afternoon. By Mr. George Graham, F. R. S. in Fleet-street, London. Made with a Telescope of ten Feet in Length, fitted with a Micrometer.*

App. Time.

At 5 <sup>h</sup> 44' 45"	It began.
6 25 30	The Cusps were vertical.
6 37 30	The Eclipse was greatest, the lucid Part of the Sun's Diameter measuring 426 Parts, whereof the Sun's Diameter measured 2311. So that the Eclipse was $9\frac{4}{7}$ Digits.
6 46 00	The Cusps were horizontal.
7 28 23	The Eclipse ended.