with orders to anoint his hands with it every night going to bed. This ointment he has continued to uſe about a month; and is now perfectly reſtored to the uſe of his hands, and begins again to work at his buſineſs.

During this courſe of anointing, he took no internal medicines, except three doſes of purging phyſic.

LXXXV. *A further Account of ſome Experiments made on the* Bovey *Coal* *.

Read Jan. 8, 1761.

SALT of hartſhorn mixed with the phlegm that diſtilled firſt from the Bovey coal, produced no ebullition, nor air bubbles; but when mixed with the watry liquor, which aroſe with the thick oil in the latter part of the proceſs, after it had ſtood ſome weeks in a glaſs bottle, cloſe ſtopt, and was become perfectly fine, cauſed a very conſiderable ebullition, and the mixture immediately grew foul and red. In ſome days after, it grew much thicker, and had the colour of tar. The ſurface of it was covered with a bituminous pellicle, as were the ſides and bottom of the glaſs. Eighteen grains of ſalt of hartſhorn were not more than ſufficient to ſaturate the acid ſalts contained in an ounce of the liquor, which was but very little ſour to the taſte.

Spirit of nitre dropped into this bituminous liquor, ſoon after it was diſtilled, and before it had depoſited the oily particles (which rendered it cloudy), changed

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* See before, p. 534.

its colour to a deep brown; but had not that effect after the liquor was become tranſparent.

The black gritty powder, which remained after the former proceſs, was put into a coated retort, and diſtilled by a naked fire; ſo that the whole body of the retort continued red-hot for more than two hours. This brought over to the receiver near an ounce of a watry bituminous liquor, rather ſtronger than that which diſtilled with a ſand heat, and a few drops only of a thick bituminous matter, which ſtuck to that part of the receiver on which they fell. The neck of the retort was thinly incruſtated with ſomething that reſembled a ſaline concrete; but was found to be only bituminous matter. In the bottom of the retort there remained a very black gritty powder.

Of this powder, one ounce was put into a crucible, ſet in a melting furnace, and kept in a pretty ſtrong fire for an hour. The powder, after it was grown cold, appeared on the ſurface to be of a pale reddiſh colour; but was not in the leaſt altered underneath. It loſt, however, in weight, near three drachms. Some of the black powder taken out of the crucible, and thrown upon a red-hot iron, burnt without flame; but emitted plentifully a heavy black ſmoke.

Two ounces of the black powder, which had been twice diſtilled, were ſet on a clear fire, in an iron ladle, and continually ſtirred from the time that the ladle grew red-hot, and the matter began to emit a heavy black ſtinking ſmoke, till no more ſmoke aroſe from it. The calcined matter remaining in the ladle weighed two ſcruples, and ſeemed to be a kind of bole earth. This earth was evaporated in two ounces of rain water to one ounce, which, ſome days after, was poured off clean from the ſediment. This water had

had not the leaſt ſaline taſte, nor did it give any ſign of effervescence, when ſpirit of nitre was dropped into it.

From the preceding experiments it appears, that the ſubſtance called foſſil-wood conſiſts, for the moſt part, of water, and that a conſiderable quantity of this principle is ſeparated from it by a gentle heat; which ſeems to be the reaſon, why ſuch foſſil-wood, on being expoſed to the ſun and air, or kept in a dry place, ſoon becomes full of ſuperficial cracks, reſembling a piece of timber, which, by lying long on the ground in the open air, has begun to decay: that though the foſſil-wood does not, like amber, or pit-coal, yield, by diſtillation, a light oil floating on its phlegm, and a volatile acid ſalt in a concrete form, yet that a light oil, and a volatile acid ſalt, in a conſiderable quantity, are intimately mixed with the water, which diſtils from it: that this foſſil-wood differs, in ſeveral particulars, from all wood belonging to the vegetable kingdom, which has been examined by fire after the ſame manner.

1ſt, Its powder burnt in a cloſe veſſel, and kept red-hot for a much longer time, than is ſufficient to reduce the like quantity of vegetable charcoal, emits (when ſprinkled on a red-hot iron) a thick heavy black ſmoke.

2dly, The ſame powder, burnt as before-mentioned, doth not eaſily take fire, nor burn of itſelf, nor conſume to aſhes, even when expoſed, in an open crucible, to a ſtrong fire, and kept in it ignited, and almoſt white, for a conſiderable time.

3dly, The matter left by this powder, after its phlogiſtic principle has been ſeparated from it by time and air, contains no alkaline ſalt, and appears

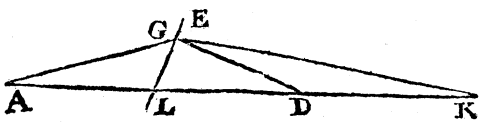
to be an aſtringent mineral earth; whereas charcoal eaſily takes fire, burns freely without ſmoke, and continues burning, till it conſumes to an aſh; which conſiſts of an alkaline ſalt, and a pure earth, fit for making cuppels; and, by theſe marks, is ſufficiently diſtinguiſhed from all mineral ſubſtances.

Groſvenor-Street, Jan. 8, 1761. Jer. Milles.

LXXXVI. *De Aberratione Luminis, in Superficiebus et Lentibus Sphæricis refractorum* *.

§ 1.

Read April 2, 1761. SI radius luminis AG, incidens in ſuperficiem quamcunque refringentem LE, inflectatur ſecundum rectam GK, et quævis recta linea AK occurrat radio incidenti AG in A, refracto GK in K; et rectæ GD, normali ad ſuperficiem refringentem LE, in D; erit rectangulum GK × DA ad rectangulum GA × DK, ut ſinus anguli incidentiæ DGA ad ſinum anguli refractionis DGK. Eſt enim DA ad GA, ut ſin. DGA ad ſin. ADG, et GK : DK :: ſin. GDK : ſin. DGK; quare, ob



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* This Paper, though ſent to England in the ſummer of the year 1760, was, by accident, prevented from being read to the Royal Society, till the 2d of April following.

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