and considering the Refractions in both,) I found the Sun at hor. 6. 55'. to be 74°.30'. in consequence of the lower Head of ♊. The difference of Longitude betwixt these two Stars is 17°.59': And therefore now the Sun in consequence of the *Lucida calcis* ♊ 92°.29'. So that the Suns *Apparent* motion betwixt the year 1582. the 5th. of *March* at hor. 4.42'. and the year 1585. the 15th. of *Septemb.* at hor. 6. 55'. *mané* (besides the whole revolutions) was 187°.16: But the *Mean* motion is 191°.2'; greater than the *Apparent* by 3°.46': Which, parted in proportion to the Equation of the Earth's motion, collected for those times from my New Tables, gives the greatest Equation of the Orb, 1°.54'.15"; consenting, to my wonder, (without any wresting of the Observations) with that, which I deduced from *Cassini*'s correct Meridional Altitudes.

I had not had time to examine any of those others, he hath related; nor indeed are they any ways convenient: But by this what I have done you may see, that if once we get Instruments to our purpose, that then it will not be difficult to correct the *Suns motions* without the consideration of the Meridional Altitudes, in which 24 seconds error gives the place above one minute amiss.

At present I use Tables, for the Suns motion, grounded on this Equation, which is less than *Tycho*'s by no less than 9 minutes: Which must needs cause great alterations in our Numbers for all the other Planets; in correcting of which, I shall employ some of those minutes I can spare from my more necessary studies; and have hopes of good success.

*Tycho*'s great Equation made him commit no small Errors, and put him upon strange shifts to hide and salve them. All his Observations of the Planets in their Oppositions to the Sun, are to be corrected, before we may attempt to represent them by Numbers: For, his Errors in the Suns place made him err sometimes 5 or 6 hours in the time of the Opposition: which must be reformed.

And that I may perform my Discourse of the Parallax of *Mars* observ'd, I shall fall upon it at my spare hours after *Christmas*.

*Some Observations and Experiments made, and in a Letter communicated to the Publisher, for the* R. Society, *by the Learned and Inquisitive Mr.* Martin Lister.

I Shall venture to entertain you at present with a few loose Notes, which you will be pleas'd to take in good part, and dispose of them as you think fitting.

I. *Of the Efflorescence of certain Mineral Glebes.*

I keep by me certain big pieces of crude Allom-Mines, such as it

was

was taken out of the Rock. I had also in the same Cabinet like pieces of the ordinary Fire-stone or Marcasite of the Coal-pits, which here we call *Brass-lumps*. In process of time both these Glebes shot forth Tufts of long and slender fibres or threads; some of them half an inch long, bended and curled like hairs. In both these Glebes, these Tufts were in some measure transparent and crystalline. These Tufts did as often repullulate, as they were struck and wiped clean off.

Herein these fibres differ'd in tast; the Alluminous very Allomy and pleasantly pungent; the Vitriolick steptique and odious: Again, the Allom-ones, being dissolv'd in fair water, raised a small ebullition; whereas the Vitriolick fibres dissolved quietly. The Allom-fibres were generally smaller, and more opaque, snow-like; the Vitriolick larger, many fibres equalling an horse-hair in thickness, and more crystalline.

The water, wherein the Allom-fibres were dissolv'd, did give no red Tincture with Gall; not by all the means I could devise to assist them; whatever hath (and that with great confidence) been said to the contrary, by some of the Writers of our *Yorkshire* Spaws: The Vitriolick did immediately give a purple tincture with Gall.

Having laid pieces of the same Marcasite in a Cellar, they were in a few moneths cover'd over with *green Copperas*, which was these Fibres shot and *again dissolved* by the moist Air, clodder'd and run together.

Exposing other pieces of the same Vitriolick Glebe in my window, where the Sun came, they were cover'd over with a white farinaceous matter, that is, with these Fibres calcined by the rays of the Sun and warm Air, beating upon them.

Of what *figure* these Fibres were, whether round or angular, I could not well discern. But I take these fibrous and thread-like shootings of Allom and Vitriol to be most genuine and natural; and their Angular shootings, after solution, into Cubes and Rhomboides, to be forc't and accidental; Salts of very different natures, as well Vegetable as Fossile, by a like process in crystallizing of them, being observ'd to shoot into like figures. But this is not my purpose at this time.

II. *Of an odd figured* IRIS. See Fig. 3. and 4.

I have not observ'd any Rock or sort of stone, whether Metalline or more Vulgar, which hath not its different sort of *Sparr*, shot in some part or other of its bed or seams. And these Sparrs differ not only in their Colours and other accidents, but eminently too in their Figure.

Figure. To pass by divers, which I have collected, I shall describe one of a very curious Figure, and which (though very common in our blew-Lime-stone Rocks, out of which plenty of Lead-Ore is got,) yet is not, that I know of, mention'd by any Author.

These Crystals are mostly of a black water, like the black flint in Chawk-hills; but there are of them, which have a purplish or amethystine colour; and some there are as clear as crystal. They adhere to the seams of the rock, be it betwixt bed and bed, or where-ever there are cross and oblique veins through the very substance of the bed.

The smaller the veins, the less the *Iris*. You will find of them as small as wheat-corns, and others an hundred times bigger. They shoot from both sides the seam, and mutually receive one the other.

They are figured thus, *viz.* a column of six plains very unequal as to breadth; the end adhering to the rock is always rugged, as a thing broken off; the other end of the column consists of three quinangular plains, very little rais'd in the middle: these plains too are very unequal. Let them hug one another, or be any ways straightned and compressed in their shooting; yet the number of plains mention'd, both of the column and top, is most certain. The places, where infinite of them may be had, are *Rainsborough Scarr* upon the *Rible*; also in a Stone-quarry near *Eshton Tarne* in *Craven*.

III. *Glossopetra tricuspis non-serrata.* Fig. 1. and 2.

Mr. *Ray* in his Travels hath these words concerning the *Glossopetræ*, pag. 115. *Of the* Glossopetræ (*saith he*) *I have not yet heard, that there have been any found in* England; *which I do not a little wonder at, there being Sharks frequently taken upon our Coasts.* I have had out of the Isle of *Shepy* in the River of *Thames*, very Sharks teeth dug up there; which could not be said to be petrifi'd; though, as to the colour, they were somewhat guilded with a Vitriolick tarnish at our first receiving them; but they were white, and in a short time came to their natural colour.

In the Stone-quarries in *Hinderskelf*-Park near *Malton*, I had this stone (the scheme whereof I send you; *fig.* 1.) the greatest rarity of this kind I ever met with, and which I took out of the rock there my self. It is a fair *Glossopetra* with 3 points, of a black liver-colour, & smooth; its edges are not serrate; its *basis* is (like the true teeth) of a rugged substance; it is carved round, the *basis* with imbossed work: It hath certain eminent ridges or lines like rays drawn from the *basis* to each point.

IV. *Of*

IV. *Of certain* Dactili Idæi, *or the true* Lapides Judaici, *for* kind *found with us in* England. *Fig.* 5.

The Stones call'd *Dactili Idæi* and *Lapides Judaici*, are brought over to us from beyond Seas in divers shapes; and some of them are described in Authors. We have plenty of them for *kind* in these parts, as in the Stone-quarries at *Newton* near *Hemsley*, and at *Hellingley* by *Malton*. There is some variety in the figure of them here also; but the most common one in these rocks is after the fashion of a *Date-stone*, round and long, about an inch, and sometime longer. They are a little swelled in the middle, and narrower towards each end: They are channelled the length-way, and upon the ridges knotted or purled all over with small knots, set in a quincunx-order. The inward substance is a white opaque Sparr, and breaks smooth like a flint; not at all hollow in the middle, as are the *Belemnites*.

V. *Of the Electrical power of Stones in relation to a Vegetable Rosin.*

It so hapned, that having occasion in *July* to view certain Fossils, which I had dispos'd of into divers Drawers in a Cabinet made of *Barbados Cedar*, I observ'd many of the stones to be thick-cover'd over with a liquid Rosin like Venice Turpentine. Examining further, there was not a Drawer, wherein there was not some more some fewer stones thus drenched.

That this could be no mistake, as from dropping, the bottoms of the Drawers are of Oak. Again, many stones, which were lapped up in papers, were yet wholly infected and cover'd with this Rosin. Besides, after diligent search there appear'd no manner of exudation in any part of the Cabinet.

Two things I thought very remarkable: 1. That of the many sorts of Stones I therein had, divers escaped, but not any of the *Hæmatites*-kind; having therein *Manganes*, *Sciftos*, *Botryades*, &c. which were all deeply concern'd. 2. That amongst perhaps 500 pieces, of the *Astroites* here and there one or two in an appartment, and sometimes more, were seised, and the rest dry; as it fares with people in the time of the Plague in one and the same house. I further observed, that stones of a soft and open grain, as well as those of a hard and polish't *superficies*, were concern'd in a manner alike.

'Tis certain, that the whole body of the Turpentine of the Cedar-wood was carried forth into the Air, and floating therein was again condensed into its own proper form upon these stones.

This makes it more than probable, that Odoriferous bodies emit and spend their very substance. Thus *Camphir* is said, if not well secured, totally to fly away. Again, it is hence evident, that there is

great

great difference betwixt the *Distillation* of Vegetable Juyces, and the *Emission* of Effluviums or this *natural* Distillation; *that* really separating and dividing the substance into different parts; but *this* carrying out the whole entirely and un-alter'd in its nature.

VI. *Of the Flower and Seed of Mushroms.*

The general and received opinion of *Botanists* concerning *Mushroms* is that, which *Caspar Bauhinus* in his *Pinax* expresses in these few words, *viz. Fungi neq; plantæ, neq; radices, neq flores, neq; semina sunt; sed nihil aliud quàm terræ, arborum, lignorum putridorum, aliarúmq, putrilaginum humiditates superfluæ.* I am of the opinion, that they are Plants of their own kind, & have more than a chance-original. We will instance in that *species*, called *Fungus porosus crassus magnus* I. B. The texture of the Gills is like a paper prickt full of pin-holes. In *August* this is very frequent under hedges, and in the middle of the Moors in many places of this Country. It seems to me (and, no doubt, it will to any person that shall well examine it,) that the Gills of this Mushrom are the very flower and seed of this Plant. When it is ripe, the Gills here are easily separable from the rest of the head: Each seed is distinct from other, and hath its impression in the head of the Mushrom, just as the seeds of an Artichoak hath in the bottom of it. The bigger end of the seed is full and round; and they are disposed in a spiral order just as those of the Artichoak. The like we do think of all other Mushroms, however differently figured.

And if it shall happen to him that shall sow them, that these will not produce their kind, but be steril; it is no strange thing amongst Plants, there being whole genus's of Plants that come up, and flower, and seed, and yet their seed was never known to produce Plants of their kind, being naturally steril, and a volatil dust, as all the *Orchides* or *Bee-flowers.*

We shall not here omit to tell you further concerning this Mushrom, that, when fresh gather'd, it is of a buff-colour inside outside; and yet, cut through the middle, it will in a moment change from a pale-yellow to a deep purple or blew, and stain linnen accordingly. A drop of the juyce, leisurely squeezed out, will change, holding it betwixt your eye and the light, through all the colours of the Rainbow, in the very time of its falling, and fix in a purple, as it doth in the springing out of its veins.

VII. *Of the speedy vitrifying of the whole body of Antimony by Cawk.*

The several vitrifications of *Antimony* are either opaque or transparent. To the first kind I shall add one, which is in it self very curious, and hath these advantages above the rest, that it is done with

great eaſe and ſpeed; and by it I have performed ſome things upon Minerals and Mettals, which with crude Antimony alone I could not effect.

Take of Antimony one pound; flux it clear: Have an ounce or two of the Cawk-ſtone (by and by to be deſcribed) in a lump red-hot in readineſs. Put it into the Crucible to the Antimony; continue the flux a few minutes: Caſt it into a clean and not greaſed Mortar, decanting the melted liquor from the Cawk.

This Proceſs gives us above 15 ounces of *vitrum* of *Antimony*, like poliſh't Steel, and as bright as the moſt refined Quickſilver. The Cawk ſeems not to be diminiſh't in its weight, but rather increaſed; nor will be brought to incorporate with the Antimony, though flux't in a ſtrong blaſt.

This Cawk-ſtone is a very odd Mineral, and I always looked upon it to be much a kin to the white milky Mineral juyces, I formerly ſent you a *ſpecimen* of: And this Experiment is demonſtrative, that I was not miſtaken; for, the milky juyce of the Lead-Mines vitrifies the whole body of Antimony in like manner.

That this Vitrification is from the *proper* nature of Cawk, I little doubt; for, I could never light upon any one mineral ſubſtance, which had any ſuch effect upon Antimony; and I have tryed very many, as *Lapis Calaminaris*, Stone-Sulphur or *Sulphur vivum*, *Galactites*, *Sulphur Marcaſite*, *Allom-glebe*, divers *Sparrs*, &c.

Cawk is a ponderous white ſtone, found in the Lead-Mines; it will draw a white line like Chawk or the *Galactites*: And though it be ſo free, that it is more firm, and hath a ſmooth and ſhining grain, Sparr-like, yet not at all tranſparent. Of the Spirit, it yields by diſtillation, another time. I am,

*York*, Novemb. 20. 1674. Sir, Your, &c.

*An Accompt of ſome Books.*

I. *TRACTS, containing* 1. Suſpicions *about ſome* Hidden Qualities *of the* Air, *with an Appendix touching* Celeſtial Magnets, *and ſome other particulars.* 2. *Animadverſions upon Mr.* Hobbs's Problemata de Vacuo. 3. *A Diſcourſe of the* Cauſe *of Attraction by Suction: By the Honourable* ROBERT BOYLE *Eſq; Fellow of the* R. Society, London, 1674. *in* 8°.

IN the *firſt* of theſe Tracts, the Noble Author, paſſing by thoſe obvious Qualities of the Air, *Heat*, *Cold*, *Dryneſs* and *Moiſture*, and ſuch others, as are now alſo well enough known, I mean, *Gravity*, *Springyneſs*, *Refractiveneſs*, &c. enquires into, and delivers his Conjectures about, ſome yet *more Latent* ones. And the chief account,

upon