

$A + \frac{1}{2} A^3 + \frac{1}{24} A^5 + \frac{17}{315} A^7 + \frac{62}{2137} A^9 \&c.$
and the *Natural Secant* to the same Arch

$1 + \frac{1}{2} A^2 + \frac{1}{24} A^4 + \frac{1}{720} A^6 + \frac{177}{15624} A^8 \&c.$
and from the Arithmetick of Infinites, the Number of these Secants being the Arch A , it follows, that the sum Total of all the Infinite Secants on that Arch is

$A + \frac{1}{2} A^3 + \frac{1}{24} A^5 + \frac{62}{2137} A^7 + \frac{277}{72376} A^9 \&c.$
the which, by what foregoes, is the *Logarithm Tangent*, of *Napeirs* form, for the Arch of $45^\circ + \frac{1}{2} A$, as before.

And Collecting the Infinite Sum of all the *Natural Tangents* on the said Arch A , there will arise

$\frac{1}{2} AA + \frac{1}{12} A^4 + \frac{1}{24} A^6 + \frac{17}{315} A^8 + \frac{11}{14172} A^{10} \&c.$
which will be found to be the *Logarithm* of the Secant of the same Arch A .

Accounts of Books.

I. *Catoptrica & Dioptrica Elementa*, Auctore Davide Gregorio, D. M. *Astronomiae Professore Saviliano Oxoniae, & Soc. Reg. Socio*, 8°. è *Theatro Oxon.* 1695.

IN this Treatise the Learned Author demonstrates the Principal Laws of Reflection and Refraction, without restraining himself to any Sect of Philosophers; as also the properties of plain and spherical Surfaces in reflecting and refracting of Rays, and by the way shews how it comes that spherical Surfaces produce the same effects with those of certain Spheroids and Conoids, *viz.* because they have the same degree of Curvature. In the *Catoptricks* he determines the place of the Image, when the Object and the Eye are not in the same axis of the reflecting Sphere: an inconvenience that *Dioptrical Machines* are not subject to.

Then he proceeds to determine the situation and bigness of the Images of sensibly big Objects, with the quan-

quantity of the Angles under which they appear, from the *Speculum* or *Lens* : and shews where to place an Object in respect of any spherical *Speculum* or *Lens*, so that its Image may be of any assigned bigness.

Afterwards he shews how to make a Microscope or Telescope of any two (or more) given *specula* or *lentes*, or of a *speculum* and *lens*, which shall magnifie in any given *ratio*, and be fitted to any given Eye : Where also all the possible Combinations of *specula* and *lentes* are univerversally considered, and the way of reckoning the Power of Catoptrical or Dioptrical or Cata-dioptrical Machines is explained ; with the way how to make a single *Lens*, which shall produce the forementioned effects.

Lastly, He shews how to make a concave *speculum* of Glafs, such that the Images of a remote Object made by its two Surfaces; may be in the same plain, which therefore *cæteris paribus*, must burn more violently than any other, The whole being written with an accuracy and judgment worthy of its Author, does well merit the esteem of the Curious and knowing in Optical Matters.

II. *Dissertationes Medico-Physicæ de antris Lethiferis ; de Montis Vesuvii incendio ; de stupendo Ossium coalitu ; de immani Hypogastrii sarcomate, à Bernardo Connor, M. D. Polonia-rum Regis Medico, Regiæ Societatis Londinensis & Cameræ Regiæ Parisiensis Socio. Ox. è Theatro Sheldoniano. 1695. in 8^o.*

THE Author of these Discourses begins with giving an account of Damps, observes a great analogy between the greater World or the Earth, and

the lesser, or Mans Body, which is very like the other, bating Life and Reason; having Bones, Cartilages, Membranes, Flesh, and several circulating Fluids which have several secretions in many parts of the Body, and which have Vapours going out from the Body, which if checked by the Pores, return and ferment into many Diseases; even so the greater World has Minerals, Metals, Stones, Waters, &c. and hath Analogous Motions, and its Vapours pent up, and having no vent may ferment, and may give rise to hot Baths, and other mineral Waters: the Vapours coming out may give occasion to Meteors, and render the Air healthful or pernicious, according to their several Natures.

These Vapours he judges sometimes to be the occasion of *Damps*, but contrary to the common opinion, which will allow of no Damps, but from actual Steams or Vapours: he thinks Death may ensue by the want of good elastick Air in the place to be breathed in, as well as by the too great plenty of hurtful Vapours.

He thinks the Atmosphære is made up of *Æther*, giving motion to its parts; Air properly so called, which has elasticity; and the Vapours from the Earth, which must be differing according to the several bodies from whence they arise. He is of opinion, that Metals, Stones and Earths have their smaller parts too closely bound together, unapt to motion, too weighty and insipid to afford those poyionous particles, which he attributes rather to Salts; as we see Antimony and Mercury become chiefly hurtful by the acid or sharp points of the Salts dissolving them. He divides them into such as may disturb the Blood by coagulation of it, or by dissolution: He instances the coagulating power of Steams by a new instance of Matter of Fact at *Paris*, of several persons digging for hidden Treasures, in a Cellar, found all dead in their several postures of work. This he illustrates by the operation of Thunder on several Bodies

Bodies, and Frost in Cold Countries freezing Men in *Moscovy*, and even in *Flanders*, so that they come as if alive on Horseback, without appearing dead to the Spectators. He thinks *Plagues* may likewise have their rise from one or other of these Steams, and according to their condensing or rarifying effects, are to be treated by cordial or heating, and cooling or coagulating remedies

As he thinks some Damps to be hurtful from the venemous Vapours, so he concludes others to kill by the Airs being too full of vaporous Matter, which in it self may be harmless, but may hinder the mixing of sufficient Air with the Blood, whereby the rarefaction and fermentation of the Blood may be hindred; this he thinks to proceed rather from Steams mixed with the Air in Caverns, than for want of motion in such places; the want of which he thinks cannot make any alteration in the Air of Caverns, it being still Air, and having the motion of a *fluid*, tho' not of *translation*. He thinks stagnant Water to corrupt by the mixture of heterogeneous Bodies from the Earth and Air, rather than the want of Motion of Translation; he is of opinion, that some Caverns are free from such Damps by a Wind coming naturally out of them, which he observed so great in the large Salt Mines in *Poland*, as to raise Tempests in them under ground.

He is of opinion that some deadly Damps proceed also from the too great abundance of *Æther* attenuating too much the Air, which he believes to be neither hurtful from pernicious steams, they not affecting Candles as those do; nor shew too great quantity of vaporous Matter; here he gives a long account of the *Neopolitan Grotto del Cane*, and the Experiments made there by him who has care of it, *viz.* that by holding a Dog by the Legs, and keeping his Head to the bottom of the Cavern, in a little while he grows convulsive, and

and dies, unless he be thrown into a neighbouring Pond of Water which is thought to be the Antidote. The Doctor tried a Dog and Pigeons in the same Cavern, and found, if their Heads were kept for some time below a Line of a greenish Colour ten inches high from the bottom of the *Grotto*, that they died; but if above that greenish Line, they lived: or if after being held there, they were not put into the Water, but only breathed in the fresh Air, they recovered. The Creatures so dying, people here eat without mischief. The Air tried with Scales, made no alteration in the Ballance.

People at *Naples* report the killing of a Captive Turk there, others Buffaloes, Asses, Mules, Sheep and other Creatures, so that no body can doubt of its being deadly. But they differ as to the reason of it, some ascribe it to miracles, from the Martyrs Blood shed there; others to an *Acid Vapour*, others to an *Alkaline*; contrary to that, the Author thinks Mercury and Antimony rather friendly than hurtful to Nature, being given every day with success by Physitians, and observes no ulcerous disposition in the Bodies of Animals killed there: neither sees he in the same the Blood more coagulated than in one killed out of the Cavern. The Keeper eats those thus killed like others, so that 'tis likely there is no poyson in them; the Author runs thro' the Nature of all sorts of poysons, and concludes it not to come from any of them, but from *Æther* coming from the sides of the Cavern, not rising higher, but taking away its Elastick Power; he tells us, that tho' a Candle will not burn below the green Line, yet Gunpowder laid in a Train to the farthest part of the Cavern, and fired at the Mouth, will flame to the end: The Author thinks that Objection of its being deadly for want of Nitrous Particles, of no force; for that Nitre has little volatile in it, and that its Spirit and Self mixt with the Blood, coagulates, rather than makes it fluid; and that the
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thousandth part of Air is not Nitrous, on which he will not enlarge, reserving that to another Discourse : But thinks it probable that the whole Air may get into the Blood and rarifie it, as we see it capable of rarefaction abroad, he having, after washing the Lungs by injections, passed the Air out of the *Trachæa Arteria* into the Heart by the *Vena Pulmonalis* ; neither does he believe Nitre necessary to flame, seeing a Fire burns in an Oven to the farther end, whether 'tis hard to conceive it could arrive unspoil'd of its Nitrous Particles. The Author gives another reason for the lingering Asthmas, Consumptions and Palfies of Stonecutters, Miners, &c. viz. the filling their Lungs with Dust, found on their dissection ; or the coagulating the Blood by degrees, and creating Obstructions in Lungs and Brain, whence paucity of Spirits, &c. which the Author thinks may be best remedied with volatiles and openers of Obstructions. He does not proceed further on *Damps*, having thought it sufficient to give this account of them in general.

The same Author gives an account of *Mount Vesuvius*, and of its late Eruption ; telling us that the Hill is blunt, and has at top a large cavity two miles about, which in the middle has another Mountain, and in it a Cavity. out of this comes the Smoak and Flame, which in *April 1694.* it began to throw out with a noise more than usual, and affrighted the people near it ; so as they removed themselves and goods. On the fifth day after, a River of Melted Metal ran down the Mountain by a slow pace : to prevent the ravage of which, the Viceroy ordered a great Ditch to be dug to receive it in, where after eight days space it rested, a mile from the Sea. Then the whole River of *Metallin Matter* was from 20 to 150 paces broad, and the depth was from 15 to 80 paces, and its length 4 miles ; the recementitious and lighter parts of which were at top, the more metallin at bottom. The Author believes this matter to have
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in it *Iron, Nitre, Sulphur* and *Antimony*, for that some of it after frequent purifyings, if made into a Cup, will prove emetick.

The account of the very extraordinary Sceleton here treated of, is already printed in these Transactions, Numb. 215.

The last part of this Book, is an account of a very large *Sarcoma* or *excrescence of the Uterus*, which came to a Woman on being frighted and kick'd on the Belly. It was 25 years growing in the Cavity of the *Uterus*, and came at last to be 22 inches long, 12 broad, and ten deep, weighing 42 *l.* and a quarter, being fleshy and uniform. The Doctor gives the Figure of it, and concludes it to be no Mole, but the inward glandulous coat of the Womb grown to that bigness, after the manner of the *Bronchocele* in the *Alps*, or the *Polipus* in the Nose; and has a great many reasonable conjectures about the probable Causes of it and other *Tumors*, which will be best seen in the Book it self, to which the Reader is referred for his further satisfaction.

L O N D O N :

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