hold each 25 or 30 pounds, and these they expose to clear Nights; and if there be any impurity remaining, it will fall to the bottom: Afterwards they break the Pots, and dry the Salt in the Sun. One might make vast quantities of Saltpetre in these parts; but the Gountry People seeing that We buy of it, and that the English begin to do the same, they now sell us a Maon of 6 pounds for two Rupius and a half, which we had formerly for half that price.

An Account of Hevelius his Prodromus Cometicus, together with some Animadversions made upon it by a French Philosopher.

This excellent Dantiscan Astronomer, Heveliur, in his Prodromus (by him so call'd, because it is as a Harbinger to his Cometography, which hath already so far passed the Press, that of twelve Books there are but three remaining to be Printed) gives an Account of the Observations he hath made of the First of the two late Comets; reserving those he hath made of the second, for that great Treatise, where he also intends to deliver the Matter of this sirst more particularly and more fully then he hath done here.

In this Account he represents the Rise, Place, Course, Swistness, Faces and Train of this Comet, interweaving his Conceptions both about the Region of Comets in general (whether it be the Air, or the Æther?) and the Gauses of their Generation: In the search of which latter, he intimates to have received much assistance from his Telescope.

He observed this Comet not before Decemb. A, (though he conceives it might have been seen since Novem. 23. st. n) & he saw it no longer then Febr. L: though several others have seen it both sooner, and later: and though himself continued to look out for it till March 7. st. n. but fruitlesly, whereof he thinks the reason to have been its too great distance and tenuity.

He

He finds, its apparent Motion was not made in a Just great Circle, but deviating considerably from it; and conceives, that every Comet talls to this deviation, when this apparent Motion grows slow, and the Star becomes Stationary (which, as he saith, it doth in respect of the Ecliptick, not its own Orbite.) Here he observes, That from Decemb. 1, to Decem. 30. Jan.9. its course was almost in a great Circle: but, that then it began to dessect from that Circle towards the North; so that afterwards, with a very notable and conspicuous Curvity, it directed its course towards Primam Arietis: Of which dessection, he ventures to assign the cause from the Cometical Matter, the various position and distance of the Comet from the Earth and the Sun, the annual Motion of the Earth, and the impressed Motion, and the inclination of the discuss of the Cometical Body.

He is pretty politive, that without the annual Motion of the E rth, no rational Account can be given of any Comet, but that all is involved with perplexities, and deform'd by abfurdities.

He inquires, since all Comets have their peculiar Ingenite Motion, what kinde of Line it is, they describe by that Motion of their own? whether circular, or streight, or curve, or partly streight and partly curve? And if curve, whether regular or irregular? if regular, whether Elliptick, or Parabolar, or Hyperbolical? Heanswers, That this Motion is Conical; and judgeth, that by the Conick path all the Phanomena of Comets can, without any inconveniency, be readily solved; even of that, which (by History) in fifty days, passed through more then the Is Signs of the Zodiack: And of that, which in two days run through eight Signs: and of another, which in 48 days posted through all the Signs, contra seriem. Which how it can be explicated upon the supposition of the Earths standing still, and upon the denying of the annual Motion thereof, he understands not at all.

P<sub>2</sub> He

He refers to his Cometography these Disquisitions: whether all Comets (in their innate Motion) move equal Spaces in equal Times? which is the swiftest, and which the slowest Motion they are capable of? what the cause of this acceleration and retardation of their true Motion?

He puts it out of doubt, that they are in the Sky it self, producing Reasons for it that are very considerable, and alledging among others, That the Parallaxes doe clearly evince it, which he finds far less in Comets, then in the Moon, yea then sometimes in the Sun it self. Where he also represents, That he hath deduced the Horizontal Parallax of this very Comet from one onely Observation, made Febr. 4. st.n. by which he found, That then it was distant from the Earth 5000 Semidiameters of the same, or 4300000 German miles. From this its distant from the earth, he deduces, That on that Day when it was so remote from the Earth, its true Diameter was 2560 German miles, which is three times bigger then the Diameter of the Earth, and almost six times bigger then that of the Moon, whose Diameter, according to his Theory, is 442 German miles.

He finds the Matter of Comets to be in the Æther it self, making the Æther and the Air to differ onely in purity, and esteeming, That the Planets do emit their Exhalations, and have their Atmospheres like unto our Earth. Where he affirms, That the Sun alone may cast out so much Matter at any time in one Year, as that thence shall be produced not one or two Comets, equalling the Moon in Diameter, but very many; which if so, what contribution may not be expected from the other Planets?

Of this Cometical Matter, he thinks, That first it is by little and little gathered together, then coagulated and condensed, and thereby reduced to a less Diameter; but then, after a while, it resolves again, and grows dilute and pale, and at last is dissipated. And accordingly he affirms, That he hath observed the Head of this Comet at first more confused, thin and pale, afterwards clearer and clearer.

He

He conceives, That all Comets do respect the Sun as their King and Centre, as Planets do, making them a kinde of Spurious Planets, that emulate the true ones in their Motion al-

most in all things.

The Train, he makes nothing else but the Beams of the Sun, falling on the head of the Comet, and passing through the same, refracted and reslected. And amongst his Observations and Schemes of this Comet, there occurs one, wherein the Tail is curve, so seen by him Decemb. 1. He assigns the causes why the Trains do so much vary, and shews also, on what depends their length.

Whether the same Comets return again, as the Spots in the Sun? and, Whether in the time of great Conjunctions they are more easily generated? and whether they can be certainly foretold? with several other Inquiries, he refers

for to his great Book.

As to Prognostications, he somewhat complains, That Mea do more inquire what Comets signific, then what they are, or how they are generated and moved; professing himself to be of the minde of those that would have Comets tather admired then feared; there appearing indeed no cogent reason, why the Author of Nature may not intend them rather as Monitors of his Glory and Greatness, then of his Anger or Displeasure; especially seeing that some very diligent Men (among whom is Gemma Fristus) take notice of as great a number of good as bad Events, consequent to Comets. Sineca also relating, That that Comet which appeared in his Time, was so happy, that it did Cometis detrahere insamiam, it cleared the credit of Comets, and made People have good thoughts of them.

Having given some Account of what may be look'd for in this Prodromus, it follows, That some also should be rendred of the Animodversions mention'd to have been made upon the same. This was done by that Paristan Philosopher Monsieur Auxout, in a Letter of his to his Country-man Monsieur Petit; in which he strongly conceives, That this I rodrowus

Tradramus contains some mistakes, of which he chiefly singles out one, as most considerable, in Hevelius's Observation of Febr. 18, and declares thereupon. That he, and feveral very intelligent Astronomers of France and Italy concurring with him therein, (whereas M. Hevelius to him feems to stand fingle, as to this particular) found by their Observations, That this Comet could not, on that day of February, be there where M. Hevelius placethit, viz. in Prima Arietis; unless it be faid, That it visited that Star of Aries on the 18th, and returned thence the 19th into its ordinary course; in which, according to his, and his feveral Correspondents Observations, the Comet on Febr. 17. was distant from that first star of Aries at least 1 degree and 17 minutes; and on Fubruary 19: (he having missed, as well as his other Friends, the Oof ryation on Febr. 18.) was advanced in its way 12 of 13 minutes, but yet distant from the said Star some minutes above a whole degree, and consequently far from having then passed it. After which time M. Auzout affirms to have seen it, as well as feveral others, for many days, and that until More b 1/2: obferving, That about Febr. 26. or 27, when the Comer was nearest to the often mentioned first of Aries, it approached not nearer thereunto, then at the distance of 50 minutes.

This important Difference between two very Learned, and very deserving Persons, being come to the knowledge of some of the ablest Philosophers and Astronomers of Fingland, hath been by them thought worthy their Examination: and they being at this very present employed in the discussion thereof, by comparing what hath been done and published by the Dissenters, and by confronting with them their own Domestick Observations, are very likely to discern where the mistake lies; and having discern'd it, will certainly be found highly impartial and ingenuous in giving their sense of the same.

## Of the Mundus Subterraneus of Athanalius Kircher.

This long expected Subterraneous World, is now come to fight, dedicated (at least the Exemplar, that hath been perused by the Publisher of these Papers, who hears, That other Copies bear Dedication to other Great Princes) both so the present Pope, as being esteemed by the Author to have a part of his Apostolical Kingdom there; and to the Roman Emperor now Regnant, who indeed in his Kingdom of Hungary and in several Provinces of Germany, hath very many and very considerable things, worthy to be observed, under Ground.

To give the Curious a taste of the Contents of this Volume, and thereby to excite them to a farther fearch into the receff sof Nature, for the composure of a good Natural Hiflory; they may first take notice, That the Author, having given an account in the Preface, what encouragement he received, for writing this Book, from the opportunity of Travelling with the Cardinal of Hassia into Sicily (in which Voyage, he saith, He met with, as it were, an Epitome of what may be observable in the Subterraneous parts of the Earth; and in particular, with an Earth-quake of 14 days duration, very instructive to him concerning several great Secrets of Nature:) having, I say, thus Prefaced, he divideth his Work into 12 Books, whereinhe affirms not onely to have explicated the Divine Structure of the under-ground World, and the wondrous distribution of the Work-houses of Nature, and her Majesty and Riches therein; but also to have opened the Causes of her Effects and Productions; whence, by the Marriage of Nature and Art, a happy Issue may follow for the use and benefit of Humane Life.

In the first Book, he considers the nature of the Centre of the Earth, where he delivers several Paradoxes touching the same, and Discourses of the Motion of heavy Bodies, of

Pendulems, of Projectils.

In the fetand, he treats of the Fabrick of the Terrestrial Globe, of the Influences it receives from the Cælestial Bodies, especially the Sun and Moon, of both which Luminaries he gives a Scheme; of the proportion of the Earth to the Sun and Moon; of the external conformation of the Earth, its Mountains, and their concatenations, decrease and increase, together with the strange transformation thereof. Further, of the Waters encompassing the Earth, and their various Communications by hidden Passages; as also of the heighth of Mountains, and of the depth of Seas; the dimension of the Sicilian Straights; the Magnetical Constitution of the Earth, its Heterogeneous Nature, Interior Frame, Laboratories, Caves, Channels, &c.

In the third: Of the Nature of the Ocean, and the diversity of its Motions; of its general Motion from East to West, Currents, Reciprocations, Gulfs, Whirle pools, Saltness, &c.

In the fourth: Of the Nature of the Subterraneous Fire, its necessity, distustiveness, food, prodigious Effects through ignivomous Mountains; as also of the Nature of Air and Winds, their power and variety; of the general Wind, how and whence generated; of Periodical and Anniversary Winds, and their Causes; as also of the production of Artiscial Winds, for refreshment and other advantages. To which he subjoyns a Discourse, tending to prove, That all Metcors owe their Nativity to the Fires of the Subterraneous World.

In the fifth: Of the Original of Springs, Rivers, Lakes; various differences and qualities of Waters, and the marks where they are to be met with under Ground; of Waters Medical, hor Baths, and their Differences, Causes, Vertues; together with the wonderful Qualities and Properties of some Springs, as to their Colour, Taste, Smell, Weight, Salubrity, Flux and reflux, Petrifying power, &c.

In the fixth: Of the Earth it felf, and the great variety contained in the Womb thoreof; of the manifold Produ-

ctions made therein, by the vertue of Salt and its Auxiliaries, the differences whereof are largely discoursed of, together with the way of extracting the same. In particular of Saltpeter, its Generation, Nature, Vertues; of the way of making Gunpowder, and the various uses thereof; as also the Nature, Qualities, Preparation, Medical and other uses of Alume and Vitriol.

In the seventh: Of some Fossils, as Sand, Gravel, Earths, and their various Differences, Qualities, uses Economical, Ghymical, Medical: together with the strange varieties and changes happening in the Earth, and their causes; as also the requisits to Agriculture.

In the eighth: First, of stones, their Origine, Concretion, difference of Colours; and in particular, of Gems and their variety, causes of generation, transparency in some and colours in others; as also of their various Figures and Pictures, by Nature formed both in common and precious Stones, with their Causes. Secondly, of the Transformation of Juices, Salts, Plants, yea of Beafts and Men turn'd into Stone: together with the generation of Bony Substances under Ground, by many esteemed to be the Bones of Grants; and of Horny Substances, taken for Unicorns horns: as also of Fossile wood and Coals. Thirdly, of Bituminous Flowers, lapis Asbestos, Amber, and its Electrical vertue; together with the way how Insects, little Fishes, and Plants are Intombed therein. Fourthly, of Subterraneous Animals, Moles, Mice, Birds, Dragons; where is also treated, of those Animals that are found in the midst of Stones.

In the ninth: First, of Poysons, their primeval Origine from Minerals, and their accidental Generation in Vegetable and Animal Bodies, together with their differences; where 'tis discoursed, not onely how Poysons may be bred in Men, but also, how the Poysons of some Animals do infect and kill Men; and, where the Venom of Vipers lodges, and how mad Dogs and Tarantula's so communicate their Poyson, as that it exserts not its noxiousness, till after some

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time:

time: Where also occasion is taken to discourse of the Original of Diseases, and cure of Poysonous ones. Secondly, of the wonderful Nature of Sulphur, Antimony, Quick filver, their origine and qualities; together with the productions of Corals and Pearls.

In the tenth: First of Metallurgy, and the way bow that unctuous Body, out of which Mettals are produced, is elaborated by Nature, and what therein are Sulphur, Salt, and Mercury; besides, what it is that renders Mettals shuid in the Fire, but not Stones and Vegetables &c. Secondly, of the Requisits to-a perfect knowledge of the Metallick Art, and of the Qualities of the Mine-master; then of the Difeases of Mine-men, and their Cure, and the ways of purging the Mines of the Airs malignity; as also of Metallognomy, or the figns of latent Mettals, and by what Art they may be discovered. Thirdly, several Accounts sent to the Author, upon his Inquiries by the Mine-masters themselves, or other chief Over-seers of the Mine-works, touching the variety, nature and properties of Minerals, and the many Accidents happening in Mines, particularly the Hungarian ones at Schemnitz, and those of Tyrol. Fourthly, of several both Hydraulick and Wind-Engines, to free the Mines from Water and noxious damps. Fifthly, Of the way of working Mettals, Gold, Silver, Copper, Iron, and particularly of the method used at Totosi in Peru, of extracting the Silver out of the Mineral: to which is added, a Difcourse of Salt pits, and the way of making Salt.

In the eleventh, First, of Alehimy, its Original and Antiquity, the Vessels and Instruments belonging thereunto. Secondly, of the Philosophers Stone, what is meant by it, and whether by means thereof true Gold can be produced? And in general, whether there be any such thing, as a true and real Transmutation of one Metal into another? Where are delivered the several Processes of the reputed Adepti, Raymund Lulle, Azeth, Arnold de Villa nova, Paracelsus, Sendivogius, &c. but all exploded as false and deceitful. Thirdly,

of the decisions in Law concerning Chymical Gold, true or false. Fourthly, what the celebrated Philosophers Stone was among the Ancients, and what they understood by the same?

In the twelfth: First, Of the seminal Principle of all things, its origine, nature and property; of the way how Nature proceeds in the Generation of Minerals, Vegetables, Animals; of spontaneous Generation; of Zeophyts, Insects of all forts, and particularly of the Worms bred in Men; together with the causes why Nature would produce such swamrs of infinite sorts of Insects. Secondly, of the varicty and differences of Vegetables; of the requisits to know the vertues of Plants, and of the several ways of Engrafting. Thirdly, of the Art of Distilling, whereby Nature is imitated, as doing all her under-ground Works, in the Opinion of this Author, by Distillation. Fourthly, of the Laboratories of various Arts, in which, according to Natures pattern, used in her Subterraneous Operations, strange things may be performed: where treating of Chymical Secrets, the truth of the Preparation of Amam potabile is discuffed, and the Magisteries of Gold, Silver, Iron, Tin, Copper and Lead, examined: to which is subjoyned an Appen. dix, furnishing such Rules, whereby Students in Chymistry may be directed in their work, and true Operations distinguished from false ones. Fifthly, of Metallostaticks, whereby the mixture of Mettals and Minerals may be certainly known; together with a way of weighing the Proportions of moist and dry, existent in every Compound, as well Vegetable and Animal, as Mineral. Sixthly, of Glass-making, where is treated of the Nature of Glass; of the Artificial Production of all forts of Precious Stones, partly from the Authors own Experiments, partly from the Communication of his Friends, and the Collection of the best Writers upon that subject. Seventhly, of Fire-works, where the Invention and Preparation of Gun-powder is largely discoursed of, and the ways of making Squibs, Fires burning in Water, and and many others, used in Publick Festivities, are described. Eighthly, of some Mechanical Arts, as that of Gold-smiths, Black-smiths, Copper-smiths, Wyre-drawers, in the last where-of he resolves this Problem; a certain weight of Mettal, and the bigness of the hole, through which the Wyre is to be drawn, being given, to finde into what length so much Mettal can be spun out.

Thus you have a view of this whole Volume; to which it may perhaps not be amiss to adde, for a Conclusion, some of those Particulars which are esteemed by the Author to out-shine the rest, and are here and there inter-woven as such. For example, in the First Part.

The use of Pindules, for knowing by their means the state of ones Health, from the different beatings of the Pulse,

Pag. 51.

The Chain of Mountains, so drawn over the Earth, that they make, as it were, an Axis, passing from Pole to Pole; and several transverse ductus, so cutting that Axis, as to make, in a manner, an Equator and Tropicks of Mountains: by which concatenation he imagines, That the several parts of the Earth are bound together for more firmness, pag. 69.

A Relation of a strange Diver, by his continual converse in Water, so degenerated from himself, That he was grown more like an Amphibium, then a Man, who, by the command of a Sicilian King, went down to the bottom of Charybdis, and brought a remarkable account of the condition of that

place pag. 98.

A Description of the Origine of the Nile, as this Author found it in a certain MS of one of his own Society, called Peter Pais, whom he affirms to have been an Eye-witness, and to have visited the Head of the Emperor of Athiopia himself Anno 1618. which Manuscript, he saith, was brought to Rome, out of Africa, by their Procurator of India and Ethiopia, pag. 72.

The

The Communication of the Seas with one another by Subterraneous Passages, viz. of the Caspian, with Pont Euxin and the Fersian Gulf; of the Mare Mortuum, with the Mare Rubrum, and of this latter with the Mediterranean; as also of Seylla with Charybdis, pag. 85. 101.

The Subterraneous Store houses (in all the four parts of the Earth) of Water, and Fire, and Air; together with their

important Uses, pag. 111.

An Account of the state of the Earth about the Poles; how the Waters are continually swallowed up by the Northern, and running along through the Bowels of the Earth, do regurgitate at the Southern Pole, pag. 159.

A Description of Mount Vesuvins and Ætna, both visited by the Author himself, Anno 1638, their Dimensions, Communication, Incendiums, Paths of Fiery Torrents cast out by them, &c. as also of the Vulcans in Iceland and Grocaland,

and their Correspondence and Effects, p. 180.

An Account of that famous and strange Whirl-pool upon the Coast of Norway, commonly call'd, The Maelstrom; which this Author fancies to have a Communication, by a Subterraneous Channel, with another such Whirl-pool in the Bodnick Bay; by which commerce, according to him, the Waters, when, upon their accumulation and crowding together in one of these places, they are swallowed up by the Gulf there, carrying along with them whatfoever is in the way, and lodging it in a certain receptacle at the bottom thereof, are conveyed through the said under-ground Channel to the other Gulf; where again, upon the like conflux and retumescence of Waters, they are absorbed, and through the same Channel do reciprocally run to the former Gulf, and meeting in their impetuous Passage with the things formerly funk down into the Repository, carry them aloft, with themselves, and cast them up again on the Coast of Norway, p. 146.

A Relation of strange Earth-quakes, p. 220.

An Enumeration of all the celebrated Medical Water and hot Barbs, in all the parts of the World, p. 263. etfeq.

In the Second Part, some of his special Observations, are, How Stones are coloured and figured under ground, p. 13. 24, 25.

Natures skill in Painting of Stones, p. 22.

A whole Natural Alphabet represented upon Stones; and all sorts of Geometrical Figures, naturally Imprinted upon

them, p. 23.

The cause of the variety of Colours in Prismes, and the Authors severe Judgement concerning those, that hold them to be meerly Phantastical, pag. 15, 16, 17. Where he also delivers an Experiment, by him counted wonderful, exhibiting all sorts of Colours by the means of Mercury, coagulated by the vapour of Lead, and put in a Brass spoon upon burning Coals.

The cause of the curious Golours in Birds, p. 17.

The way of Nature in the Generation of Diamonds, p. 21.

A way of preparing such a Liquor, that shall sink into, and colour the whole Body of Marble, so that a Pisture made on the surface thereof, shall, the stone being cut through, appear also in the inmost parts of the same, p. 43.

A Story of a whole Vilage in Africa turned into Stone,

with all the People thereof, p. 50.

An Experiment, representing the Generation of the Stone in the Bladder, p. 52.

An Asbesian Paper, that shall last perpetually, p. 74.

Several Relations of numerous Societies of People living under ground, and their Oeconomy; whereof a strange one is alledged to have been found in England, attested by an English Author, p. 97, 98, 99.

A Relation of a Man, that bred a Serpent in his Stomach, which came from him of the length of one Foot and a half, affirmed by the Author to have been feen by himself, p. 126.

Of whole Forrests of Coral at the bottom of the Red Sea, pag. 159. The

The vanity of the Virga Divinatoria, p. 181.

A peculiar way of washing out very small Dusi-gold, p. 198.

Of some extraordinary big pieces of persect Natural Gold

and Silver, p. 203.

Of a very rare Mineral, sent to the Author out of the Hungarian Mines, which had pure Silver branching out into Filaments, and some splendent yellow parts, which was pure Gold, and some dark parts, which was Silver mixed with Gold, p. 189.

Salt, the Basis of all Natural Productions, and the admi-

rable variety of Salts. p. 299.

Strange Figures of Plants, p. 348.

The way of reproducing Plants, p. 414.

In how much time a Swallow can fly about the World, p. 418. Oc.

This may suffice, to give occasion to the Searchers of Nature, to examine this Book, and the Observations and Experiments contained therein, together with the Ratiocinations raised thereupon, and to make severer and more minute sugaries and Discussions of all.

A farther Account of an Observation above-mentioned, about white Blood.

Since the Printing of the former Sheet, there is this far-

ther account from the same hand. Mr. Boyle,

I have at length, according to your desire, receiv'd from the Ingenious Dr. Lower, an account in Writing of the Observation about Chyle found in the Blood; which though you may think strange, agrees well with some Experiments of his and mine, not now to be mention'd. The Relation, though short, comprizing the main Particulars of what he had more fully told me in Discourse, I shall give it you with little or no variation from his own Words.

A Moid,

A Maid, after eating a good Break-fast, about seven in the Morning, was let Blood about eleven the same day in her Foot; the first Blood was receiv'd in a Porringer, and within a little while it turn'd very white; the last Blood was received in a sawcer, which turned white immediately, like the white of a Custard. Within five or six hours after, he (the Physitian) chanced to see both, and that in the Porringer was half Blood and half Chyle, swimming upon it like a Serum as white as Milk, and that in the Sawcer all Chyle, without the least appearance of a drop of Blood; and when he heated them distinctly over a gentle Fire, they both harden'd: As the white of an Egge when 'tis heated, or just as the Serum of Blood doth with heating, but far more white. This Maid was then in good health, and onely let Blood because she never had her Courses, yet of a very florid clear Complexion.

Note.

The Reader of these Papers is desired, that in those of Numb. 4. pag. 60. lin. 10. he would please to read eight, instead of hundred; this latter word having been put in by a great over-sight, and, without this Correction, injuring that Author, whose Considerations are there related. This Advertisement should have been given in Numb. 5. but was omitted for haste.

Imprimatur Rob. Say, Vice-Cancel. Oxon.

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