

WOOD LIBRARY-MUSEUM

Accession no. RB7428

WB
356
L953
1666
RB

771

WOOD LIBRARY-MUSEUM



OF ANESTHESIOLOGY

P. - Whitrop C. Harper - 5.21.73 - 250

P. - L. Hoop C. Harper - 5. 21. 73 - 250

37. BLOOD TRANSFUSION.—LOWER (Richard). The Method observed in Transfusing the Bloud out of one Animal into another. 4to. Pp. 353-358 in *Philosophical Transactions*, Number 20, December 17, 1666. \$250

Garrison-Morton 2012: "In February 1665 Lower successfully transfused dogs with blood." Solidly bound together, in full cloth, with *Philosophical Transactions*, Number 22, Febr. 11, 1666, pp. 385-408.

PHILOSOPHICAL TRANSACTIONS.

Munday December 17. 1666.

The Contents.

The Method observed in Transfusing the Bloud out of one live Animal into another: And how this Experiment is like to be improved. Some Considerations concerning the same. An Account of some Sanative Waters in Herefordshire. A farther Account of the Vitriolate Water mention'd Numb. 18. together with some other particulars touching Waters. Inquiries for Turkey. An Observation about Optick Glasses made of Rock-Crystal, communicated from Italy. A Relation of the Use of the Grain of Kermes for Coloration, from France. An Account of some Books lately publisht, vid. 1. PINAX Rerum Naturalium BRITANNICARUM, continens VEGETABILIA, ANIMALIA & Fossilia ANGLIÆ, inchoatus; Auth. Christophoro Merret, M. D. 2. PLACITA PHÏLOSOPHICA Guarini. 3. GUSTUS ORGANUM per Laurentium Bellini deprehensum.

The Method observed in Transfusing the Bloud out of one Animal into another.

THIS Method was promised in the last of these Papers. It was first practis'd by Dr. Lower in Oxford, and by him communicated to the Honourable Robert Boyle, who imparted it to the Royal Society, as follows:

First, Take up the Carotidal Artery of the Dog or other Animal, whose Bloud is to be transfused into another of the

same or a different kind, and separate it from the Nerve of the *Eighth pair*, and lay it bare above an inch. Then make a strong Ligature on the *upper* part of the Arterie, not to be untied again: but an inch below, *videl.* towards the Heart, make another Ligature of a *running knot*, which may be loosen'd or fastened as there shall be occasion. Having made these two knots, draw two threds under the Artery between the two Ligatures; and then open the Artery, and put in a Quill, and tie the Artery upon the Quill very fast by those two threds, and stop the Quill with a stick. After this, make bare the *Jugular Vein* in the other Dog about an inch and a half long; and at each end make a Ligature with a running knot, and in the space betwixt the two running knots drawn under the Vein two threds, as in the other: then make an Incision in the Vein, and put into it two Quills, one into the *descendent* part of the Vein, to receive the blood from the other Dog and carry it to the Heart; and the other Quill put into the other part of the *Jugular Vein*, which comes from the Head (out of which, the second Dogs own blood must run into Dishes.) These two Quills being put in and tyed fast, stop them with a stick, till there be occasion to open them.

All things being thus prepar'd, the Dogs on their sides towards one another so conveniently, that the Quill may go into each other, (for the Dogs necks cannot be brought so near, but that you must put two or three several Quills more into the first two, to convey the blood from one to another.) After that unstop the Quill that goes down into the first Dog's *Jugular Vein*, and the other Quill coming out of the other Dog's Artery; and by the help of two or three other Quills, put into each other, according as there shall be occasion, insert them into one another. Then slip the running knots, and immediatly the blood runs through the Quills, as through an Artery, very impetuously. And immediately, as the blood runs into the Dog, unstop the other Quill, coming out of the *upper* part of his *Jugular Vein* (a Ligature being first made about his Neck, or else his other *Jugular Vein* being compress'd by ones Finger;) and let his own blood run out at the same time into Dishes (yet not constantly, but according as you perceive him able to bear it) till

till the other Dog begin to cry, and faint, and fall into Convulsions, and at last dye by his side.

Then take out both the Quills out of the Dogs *Jugular* Vein, and tie the running knot fast, and cut the Vein asunder, (which you may doe without any harm to the Dog, one *Jugular* Vein being sufficient to convey all the blood from the Head and upper parts, by reason of a large *Anastomosis*, whereby both the *Jugular* Veins meet about the *Larynx*.) This done, sew up the skin and dismiss him, and the Dog will leap from the Table and shake himself and run away, as if nothing ailed him.

And this I have tried several times, before several in the *Universities*, but never yet upon more than one Dog at a time, for want of leisure, and convenient supplies of several Dogs at once. But when I return, I doubt not but to give you a fuller account, not only by bleeding several Dogs into one, but several other creatures into one another, as you did propose to me, before you left *Oxford*; which will be very easie to perform; and will afford many pleasant and perhaps not unuseful Experiments.

But because there are many Circumstances necessary to be observ'd in the performing of this Experiment, and that you may better direct any one to doe it, without any danger of killing the other Dog, that is to receive the others blood, I will mention two or three.

First, that you fasten the Dogs at such a convenient distance, that the Vein nor Artery be not stretched; for then, being contracted, they will not admit or convey so much blood.

Secondly, that you constantly observe the Pulse beyond the Quill in the Dogs *Jugular* Vein (which it acquires from the impulse of the *Arterious* blood:) For if that fails, then 'tis a sign the Quill is stop't by some congealed blood, so that you must draw out the *Arterial* Quill from the other, and with a *Probe* open the passage again in both of them, that the blood may have its free course again. For, this must be expected, when the Dog, that bleeds into the other, hath lost much blood, his heart will beat very faintly, and then the impulse

of blood being weaker, it will be apt to congeal the sooner, so that at the latter end of the work you must draw out the Quill often, and clear the passage; if the Dog be faint-hearted, as many are, though some stout fierce Dogs will bleed freely and uninterruptedly, till they are convuls'd and dye. But to prevent this trouble, and make the experiment certain, you must bleed a great Dog into a little one, or a *Mastive* into a *Curr*, as I once try'd, and the little Dog bled out at least double the quantity of his own blood, and left the *Mastive* dead upon the Table, and after he was untied, he ran away and shak'd himself, as if he had been only thrown into water. Or else you may get three or four several Dogs prepared in the same manner; and when one begins to faint and leave off bleeding, administer another, and I am confident one Dog will receive all their blood, (and perhaps more) as long as it runs freely, till they are left almost dead by turns: provided that you let out the blood proportionably, as you let it goe into the Dog, that is to live.

Thirdly, I suppose the Dog that is to bleed out into dishes will endure it the better, if the Dogs that are to be administered to supply his blood, be of near an equal age, and fed alike the day before, that both their bloods may be of a new strength and temper.

There are many things I have observed upon bleeding Dogs to death, which I have seen since your departure from *Oxford*, whereof I shall give you a relation hereafter; in the mean time since you were pleased to mention it to the *Royal Society*, with a promise to give them an account of this experiment, I could not but take the first opportunity to clear you from that obligation, &c.

So far this Letter; the prescriptions whereof having been carefully observ'd by those who were employed to make the Experiment, have hitherto been attended with good success; and that not only upon Animals of the same *Species* (as two Dogs first, and then two Sheep.) but also upon some of very differing *Species* (as a Sheep and a Dog; the former *Emitting*, the other *Receiving*.)

Note only, that instead of a Quill, a small crooked thin
Pipe

Pipe of Silver or Brass, so slender that the one end may enter into a Quill, and having at the other end, that is to enter into the Vein and Arterie, a small knob, for the better fastening them to it with a thread, will be much fitter than a strait Pipe or Quill, for this Operation : for so they are much more easie to be managed.

'Tis intended, that these tryals shall be prosecuted to the utmost variety the subject will bear: As by exchanging the blood of Old and Young, Sick and Healthy, Hot and Cold, Fierce and Fearful, Lame and Wild Animals, &c. and, that not only of the same, but also of differing kinds. For which end, and to improve this noble Experiment, either for knowledge, or use, or both, some Ingenious men have already proposed considerable tryals and Inquiries ; of which perhaps an account will be given hereafter. For the present we shall only subjoyn some

Considerations about this kind of Experiments.

1. It may be consider'd in them, that the blood of the *Emittent* Animal, may after a few minuts of time, by its circulation, mix and run out with that of the *Recipient*. Wherefore to be assured in these Tryals, that all the blood of the *Recipient* is run out, and none left in him but the adventitious blood of the *Emittent*, two or three or more Animals (which was also hinted in the *method* above) may be prepared and administered, to bleed them all out into one.

2. It seems not irrational to guess afore hand, that the exchange of blood will not alter the nature or disposition of the Animals, upon which it shall be practised ; though it may be thought worth while for satisfaction and certainty, to determine that point by Experiments. The case of exchanging the blood of Animals seems not like that of *Grafting*, where the *Cyons* turns the Sap of the *Stock*, grafted upon, into its nature ; the *Fibres* of the *Cyons* so straining the juice, which passes from the stem to it, as thereby to change it into that of the *Cyons*, whereas in this transfusion there seems to be no such

Per-

Percolation of the blood of Animals, whereby that of the one should be changed into the nature of the other.

3. The most probable use of this Experiment may be conjectured to be that one Animal may live with the blood of another; and consequently, that those Animals, that want blood, or have corrupt blood, may be supplied from other with a sufficient quantity, and of such as is good, provided the Transfusion be often repeated, by reason of the quick expence that is made of the blood.

Note.

In the last Transactions was also promised an Accompt by the next, of Monsieur Hevelius his accurate Calcul. of the late Solar Eclipses, Duration, Quantity, &c. But this being to be accompanied with a Scheme, the Graving whereof met with a disappointment, it must be still referred to another Opportunity.

An Accompt of some Sanative-waters in Herefordshire.

This account was communicated by Dr. B. in these words.

There are two Springs in *Herefordshire*, whereof one is within a Bolt, or at least Bow-shoot of the top of the near adjoining loftie Hill of *Malvern*, and at great distance from the Foot of the Hill; and hath had a long and old fame for healing of eyes. When I was for some years molested with Tetters on the back of one and sometimes of both my hands, notwithstanding all endeavors of my very friendly and skilful Physicians I had speedy healing from a neighbouring Spring of far less fame. Yet this Spring healed very old and Ulcerous sores on the Legs of a poor Fellow, which had been poyson'd by Irons in the Gaol, after other Chirurgery had been hopeles. And by many tryals upon my hands, and the Tetters; I was perswaded, that in long droughts, and lasting dry Frosts, those waters were more effectually and more speedily healing, than at other times. And not to omit this circumstance, I did hold this water in my mouth, till it was warm, and perchance somewhat intermingled with fasting Spittle, and

and so dropping it upon the Tetter, I there could see it immediately gather a very thin skin upon the raw flesh, not unlike that which is seen to gather upon Milk over a gentle fire. This skin would have small holes in it, through which a moisture did issue in small drops, which being wip'd away, and the water continued to be dropp'd warm out of the mouth, the holes would diminish, and at last be all quite healed up.

For the *Eye-waters*, I conceived them more strongly terfive, and clearing the Eyes; and they had a rough smartness, as if they carry'd Sand or Gravel into the Eye.

I have known and try'd three or four healing Fountains of late discovery, or of no old fame that I could hear of.

I did once put rich *Marle* for some days in a vessel of water, to try whether the water would acquire a healing vertue; but my Experiments were interrupted. I had in my thoughts many other ways of Tryal; which I may resume hereafter.

A farther Accompt of the Vitriolate-water, mention'd Num. 18 p. 323. Together with some other particulars touching waters.

This comes from the same hand as follows;

I formerly mentioned to you, that, if that Pool of Mr. *Phillip's*, which seems to be of Vitriolate-water, were on my ground, I would drain it, and search the head of the Spring, pursuing the source, till I could well discern, through what lay of Earth or Gravel it does pass. Now I shall tell you, that I have taken order for the further tryal of the said Water, by boiling a greater quantity in a Furnace, &c. But just as we were in readiness for the tryal, a stream of Rain-water fell into the Pool, and so discourag'd us for the present. I have also taken a course to turn the falling Waters aside, and to drain the Pool, that we may see, what the Native Springs (whether one or more) may be. Of which more hereafter.

I wish (so be goes on) we had a full Accompt of our Salt-Springs at *Droyt-wych* near *Worcester*, and at *Nant-wych* in *Cheshire* (what other Salt-Springs we have in *England*, I know not:)

It

It should be inquired, at what distance they are from the Seas, or from Salt-fluxes, from Hills, and how deep in the Vales? What the weight? Whether in droughts or long Frosts the proportion of Salt or weight increaseth? Whether the Earth near the Springs, or in their passage hath any peculiar ferment, or produceth a blackishness, if it rests, after it is well drained.

Inquiries for Turkey.

Though many Relations and Descriptions of *Turky* be extant in Print, yet they leave in many a desire of a fuller information in the following particulars, lately drawn up, for the most part by Mr. *H.* and recommended to an Ingenious Gentleman, bound for that Country; and desired also to be taken notice of by others, that may have occasion to visit the same.

* *Rusma* is a kind of Earth, used in *Turky* to take away hair.

1. In what part of *Turky* the **Rusma* is to be found; and in what quantity? Whether the *Turks* employ it to any other Uses, besides that of the taking away of Hair? Whether here be differing kinds of it? How it is used to take of hair, and how to get store of it.

2. Whether the *Turks* do not only take *Opium* themselves for strength and courage, but also give it to their Horses, Camels and Dromedaries, for the same purpose, when they find them tired and faint in their travelling? What is the greatest *Dose*, any men are known to have taken of *Opium*? and how prepared?

3. What effects are observed from their use, not only of *Opium* (already mention'd) but also of Coffee, Bathing, shaving their Heads, using Rice; and why they prefer that which grows not unless water'd, before Wheat, &c.

4. How their *Damasco*-steel is made and temper'd?

5. What is their way of dressing and making Leather, which though thin and supple, will hold out water?

6. What method they observe in breeding those excellent Horses, they are so much famed for?

7. Whether they be so skilful in Poysoning, as is said; and how their Poysons are curable?

8. How

8. How the *Armenians* keep Meat fresh and sweet so long, as 'tis said they do ?

9. What Arts or Trades they have worth Learning ?

10. Whether there be such a Tree about *Damascus*, call'd *Mouslac*, which every year about the Month of *December* is cut down close by the root, and within four or five Months time shoots up again apace, bringing forth Leaves, Flowers, and Fruit also, and bearing but one Apple (an excellent Fruit) at once ?

11. Whether about *Reame* in the Southern part of *Arabia Felix*, there be Grapes without any grains ? And whether the people in that Country live, many of them, to a hundred and twenty years, in good health ?

12. Whether in *Candia* there be no poysonous Creatures ; and whether those Serpents, that are there, are without poyson ?

13. Whether all Fruits, Herbs, Earth, Fountains, are naturally saltish in the Isle of *Cyprus* ? And whether those parts of this Isle, which abound in *Cyprus-trees*, are more or less healthful, than others ?

14. What store of *Amianthus* there is in *Cyprus* ; and how they work it ?

15. Whether *Mummies* be found in the sands of *Arabia*, that are the dried flesh of men buried in those sandy Deserts in travelling ? And how they differ in their vertue from the Embalmed ones ?

16. Whether the parts about the City of *Constantinople* or *Asia Minor*, be as subject to Earth-quakes now, as they have been formerly ? And whether the Eastern Winds do not Plague the said City with Mists, and cause that inconstancy of Weather, it is said to be subject to ?

17. Whether the Earth-quakes in *Zant* and *Cephalonia* be so frequent, as now and then to happen nine or ten times a Month ? And whether these Isles be not very Cavernous ?

18. What is the height of Mount *Caucasus*, its position, temper in its several parts, &c.

19. With what declivity the Water runs out of the *Euxine-Sea* into the *Propontis* ? With what depth ? And if the many Tides and Eddies, so famous by the name of the *Euripi*, have any certain Period ?

20. If in the *Euxine-Sea* there can be found any sign of the *Caspian Seas* emptying it self into it by a passage under ground? If there be any different Colour, or Temper as to Heat or Cold; or any great Current or Motion in the Water, that may give light to it?

21. By what Inland passages they go to *China*; there being now a passage for *Caravans* throughout those places, that would formerly admit of no Correspondence by reason of the Barbarisme of the Inhabitants?

22. Whether in the Aquæducts, they make, they line the inside with as good Plaister, as the Ancients did? and how theirs is made?

23. To inquire after these excellent Works of Antiquity, of which that Country is full, and which by the ignorant are not thought worth notice or preservation? And particularly, what is the bigness and structure of the Aquæducts, made in several places about *Constantinople* by *Solyman the Magnificent*? &c.

An Observation of Optick Glasses made of Rock-Chrystal.

This is contained in a Letter, of *Eustachio Divini*, Printed in *Italian* at *Rome*, as the 39. *Journal des Scavans* extracts it; *vid.*

Though it be commonly believed, that *Rock-Chrystal* is not fit for Optick-Glasses, because there are many Veins in it; yet *Eustachio Divini* made one of it, which he saith proved an excellent one, though full of Veins. *

* It may be queried whether those were true Veins, or only Superficial Strictures, and slight scratches.

An Accompt of the Use of the Grain of Kermes for Coloration.

This was communicated by the Ingenious Dr. *Croon*, as he received it from one *Monfieur Verny*, a *French* Apothecary at *Montpelier*; who having described the Grain of *Kermes*, to be an excrecence growing upon the Wood, and often upon the leaves.

leaves of a Shrub, plentiful in *Languedock*, and gather'd in the end of *May*, and the beginning of *June*, full of a red Juyce; subjoyns two Uses, which that Grain hath, the one for *Medicine*, the other for *Dying of Wool*. Waving the *first*, notice shall only be taken here of the *latter*, vid. That, for *Dying*, they take the Grain of *Kermes*, when ripe, and spread it upon Linnen: And at first, whilst it abounds most in moisture, 'tis turn'd twice or thrice a day, to prevent its Heating. And when there appears red powder amongst it, they separate it, passing it through a Searce; and then again spread abroad the Grain upon Linnen, untill there be perceived the same redness of the powder; and at the end, this red powder appears *about* and *on* the surface of the Grain, which is still to be pass'd through a Searce, till it render no more.

And in the beginning, when the small red Grains are seen to move (as they will do) they are sprinkled over with strong Vinegar, and rubb'd between ones hands: afterwards little balls are form'd thereof, which are expos'd to the Sun to dry.

If this red powder should be let alone, without pouring Vinegar or some other acid liquor upon it, out of every Grain thereof would be form'd a little Fly, which would skip and fly up and down for a day or two, and at last changing its colour, fall down quite dead, deprived of all the bitterness, the Grains, whence they are generated, had before.

The Grain being altogether empty'd of its pulp or red powder, 'tis wash'd in Wine, and then expos'd to the Sun Being well dry'd, 'tis rubb'd in a Sack to render it bright; and then 'tis put up in small Sacks, putting in the midst, according to the quantity, the Grain has afforded, 10. or 12 pounds (for a *Quintal*) of the dust, which is the red powder, that came out of it. And accordingly, as the Grain affords more or less of the said powder, Dyers buy more or less of it.

'Tis to be noted, That the first red powder, which appears, issues out of the Hole of the Grain, that is on the side, where the Grain adhered to the Plant. And that, which about the end appears sticking on the Grain, hath been alive in the husk, having pierced its covers though the hole, whence it commonly issues, remains close as to the Eye.

An Account of some Books lately published.

I. PINAX Rerum Naturalium BRITANLIARUM continens VEGETABILIA, ANIMALIA & FOSSILIA in hoc Insula reperta, inchoatus, Auth. Christophoro Merret, Med. D. & utriusque Societatis Regiæ socio.

The Learned and Inquisitive Author of this Book, hath by his laudable example of collecting together, what Natural things are to be found here in *England*, of all sorts (which he has done upon his own expences) given an invitation to the curious in all parts of the world to attempt the like, thereby to establish the much desired and highly useful commerce among *Naturalists*, and to contribute every where to the composing of a genuine and full *History of Nature*.

In the *Preface* he intimates, that his stock does still encrease daily; and that therefore the Reader may expect an *Appendix* to this collection.

In the Body of the Book, he enumerates all the *Species*, Alphabetically: And, as to *Vegetables*, he reckons up about 410 sorts; and gives their *Latine* and *English* Names, and the *Places* and *Times* of their growth: reducing them afterwards to certain *Classes*, hitherto used by *Botanick* Writers in their *Histories* of *Plants*: Adding the *Etymology* of their *Generick* Names, and a compendious *Register* of the Time, *when* and *how long* the *English* Plants do shoot and flourish.

As to *Animals*, he finds of them about 340. kinds in *England*, whereof the *fourfooted* are about 50. *Birds* 170. and *Fishes* 120. *Insects* are innumerable, which yet he endeavours to enumerate, and to reduce to certain *Classes*; into which he also brings the three former kinds.

Concerning *Fossils*, he first takes notice of the *Metals* found in *English* Mines; as *Silver*, *Tin*, *Copper*, *Iron*, *Lead*, *Antimony*, and some *Gold* extracted out of *Tin*. Next of the *Stones*, of which he finds about 70 sorts; & amongst them, *Bristol-Diamonds*, *Agates*, *Hyacinths*, *Emerods*, *Loadstones*, *Toad-stones*, (which last yet he affirms to be nothing but the grinding-teeth of the Fish.

Fish *Lupus*) *Pearls, Corals, Marble, Alabaster, Emery*: To which he adds the various kinds of *Coals*; as also *Bitumens, Turfs*, and *Jets*. And *thirdly* of the various kinds of *Allam, Vitriol, Niter, Sea-salt, Pit-salt*. But *fourthly* of the various *Earths*, of which he reckons up 15. peculiar sorts (besides those that serve for *Husbandry*, which are not easily numbred;) and amongst them, *Read-lead, Black-lead* and *Fullers-earth*.

He concludes all with mentioning the several *Meteors* appearing in *England*; and the *Hot Springs*, and *Medical Waters*; as also, the *Salin, Petrifying*, and some more unusual Springs: *Item, Subterraneous Trees, Subterraneous Rivers, Ebbings and Flowings of Wells, &c.*

II. *PLACITA PHILOSOPHICA Guarini*. The chief subject of this Treatise is Natural *Philosophy*; upon many important questions whereof it enlargeth, as those of the Motion of the *Cœlestial Bodies*, of *Light*, of *Meteors*, and of the vital and animal functions; leaving sometimes the common opinions, and delighting in the defence of *Paradoxes*.

E. G. That the material substantial Form, is nothing but *mera potentia*, and subsists not by it self: by which means the Author judges, he can free himself from many great difficulties touching *Generation* and *Corruption*, which do perplex the other Philosophers.

He holds *Epicycles* to be impossible, and *Excentricks*, not sufficient to explicate the motion of the Stars; but that all the irregularities of this motion may be salved by the means of certain *Spiral Lines*; largely proving this *Hypothesis*, and particularly explicating the motion of each Planet.

He denies the middle Region of the Air to be cold; and believes that cold is not necessary to condense the vapours into Water.

He admits not that received Axiome, *That the generation of one Body is the corruption of another*; maintaining that there are *Generations*, to which no corruption ever preceded; and that it may happen, that one Animal without dying may be changed into another Animal.

He alledges several reasons to evince, that the Air breathed in, enters not only into the whole capacity of the Chest, but also into the lower belly.

He

He is of opinion that the Air, which is commonly believed to corrupt easily, is incorruptible; alledging among other reasons, this for one, that experience shews, that if a Bottle be exactly stop'd, there is never any mixt Body form'd in it; wherefore, *saieth he*, the Air is not corrupted there.

He maintains, that 'tis not the *Magnet* that draws the Iron, but rather the Iron that attracts the *Magnet*. To explain which he affirms, that the Load-stone spreads abroad out of it self many corpuscles, which the substance of the Iron imbibes, and that, as dry things attract those that are moist, by the same reason Iron draws the Loadstone.

He rejects the *species intentionales*, *Vital* and *Animal* Spirits, and holds many other uncommon opinions, touching *Light*, the *Iris*, the *Flux and Reflux of the Sea*, &c.

III. *GUSTUS ORGANUM* per Laurentium Bellini *novissimè deprehensum*.

This Author proposing to himself to discover both the principal *Organ* of the *Taste*, and the nature of its *object*, begins with the latter, and examines first, what is *Taste*? He judges that it is caused by nothing but Salts, which being variously figured, affects the tongue variously: alledging this for his chief reason, that the Salt which is extracted by *Chymists* out of any mixt body whatever it be, carries away with it all its taste, and that the rest remains tasteless. He adds that the Teeth in grinding the Food, serve much to extract this Salt: And he notes by the by, that the Teeth are so necessary for preparing the aliment, that certain Animals which seem to have none, have them in their stomach; and that nature has put at the entry of the palat of those that are altogether destitute of them, certain moveable inequalities, which are to them instead of Teeth.

But then *secondly*, concerning the *Organ* of Taste, he esteems, that 'tis neither the Flesh, nor the Tongue, nor the Membrans, nor the Nerves found there, nor the Glanduls, called *Amygdalinae*; but those little eminences that are found upon the tongue of all Animals. To obtain which, he observes,

1. That from the middle of the Tongue to the root, as also towards the tip, there are found innumerable little *Risings* called

led *Papillares*; but that from the tip of the Tongue unto the string there is observed none at all.

2. He hath experimented, that if you put *Sal Armoniack* upon the places of the Tongue, where those *Eminencies* are not, you shall find no Taste; but that you will find it presently as soon as you put any such Salt, where they are to be met with. Ergo, saith he, those *Eminencies* are the principal Organ of Taste.

3. He assures, that with a *Microscope*, may be seen in those *Risings* many little holes, at the bottom whereof there are small nerves, terminating there: But he directs, to observe this in live and healthy, not in dead or sick Animals.

Having laid down these Observations, he concludes, that the manner, after which Taste is perform'd, is this, That the particles of Salt passing through those pores, which pierce the *Papillary Eminences*, and penetrating as far as to the nerves, that meet them there, do by the means of their small points prick them; which pricking is called the *Taste*.

In the mean time he acknowledges, that before him Signior *Malphigi*, Professor at *Messina*, had made some of these discoveries.

The notice of these two last Books we owe to the *French Journal*.

Correct in Number. 19.

Page, 342. line, 33. read *mint Ores*, in stead of, *mint with Ores*.

London, Printed for John Martin, Printer to the Royal Society, and are to be sold at the Bell a little without Temple-Bar.

PHILOSOPHICAL TRANSACTIONS.

Monday, February 11. 1666.

The Contents.

Trials proposed to be made for the Improvement of the Experiment of Transfusing Blood out of one live Animal into another. A Method for Observing the Eclipses of the Moon, free from the Common Inconveniences. An Account of some Celestial Observations lately made at Madrid. Extract of a Letter, lately written to the Publisher, containing some Observations about Insects and their Innoxiousness, &c. An Account of some Books, vid. I. TOME TROISIEME DES LETTRES DE M. DESCARTES. II. ASTRONOMIA REFORMATA P. RICCIOLI. III. ANATOMIE MEDULLÆ SPINALIS ET NERVORUM, inde provenientium, GERARDI BLASII, M.D. An Advertisement about the re-printing of M. Evelyns Sylva and Pomona. A Table of the Transactions, printed these two years.

Tryals proposed by Mr. Boyle to Dr. Lower, to be made by him, for the Improvement of Transfusing Blood out of one live Animal into another; promised Numb. 20. p. 357.

THe following *Queries* and *Tryals* were written long since, and read about a Moneth ago in the *R. Society*, and do now come forth against the Authors intention, at the earnest desire of some Learned Persons, and particularly of the worthy *Doctor*, to whom they were address'd; who thinks, they may excite and assist others in a matter, which, to be well prosecuted, will require many hands. At the reading of them, the *Author* declared, that of divers of them he thought he could fore-see the Events, but

E e e

yet

yet judged it fit, not to omit them, because the Importance of the *Theories*, they may give light to, may make the Tryals recompence the pains, whether the success favour the *Affirmative* or the *Negative* of the Question, by enabling us to determine the one or the other upon surer grounds, than we could otherwise do. And this Advertisement he desires may be applied to those other Papers of his, that consist of *Queries* or proposed Tryals.

The Quæries themselves follow.

1. Whether by this way of Transfusing Blood, the disposition of Individual Animals of the same kind, may not be much altered? (As whether a *fierce* Dog, by being often quite new stocked with the blood of a *cowardly* Dog, may not become more tame; & *vice versa*, &c?)

2. Whether immediately upon the unbinding of a Dog, replenisht with adventitious blood, he will know and fawn upon his Master; and do the like customary things as before? And whether he will do such things better or worse at some time after the Operation?

3. Whether those Dogs, that have *Peculiarities*, will have them either abolisht, or at least much impaired by transfusion of blood? (As whether the blood of a *Mastiff*, being frequently transfused into a *Blood-hound*, or a *Spaniel*, will not prejudice them in point of scent?)

4. Whether acquired Habits will be destroy'd or impair'd by this Experiment? (As whether a Dog, taught to fetch and carry, or to dive after Ducks, or to sett, will after frequent and full recruits of the blood of Dogs unfit for those Exercises, be as good at them, as before?)

5. Whether any considerable change is to be observ'd in the Pulse, Urin, and other Excrements of the *Recipient* Animal, by this Operation, or the quantity of his insensible Transpiration?

6. Whether the *Emittent* Dog, being full fed at such a distance of time before the Operation, that the mass of blood may be suppos'd to abound with *Chyle*, the *Recipient* Dog, being before hungry, will lose his appetite, more than if the *Emittent* Dogs blood had not been so chylous? And how long, upon a
Vein

Vein opened of a Dog, the admitted blood will be found to retain Chyle?

7. Whether a Dog may be kept alive without eating by the frequent Injection of the Chyle of another, taken freshly from the Receptacle, into the Veins of the Recipient Dog?

8. Whether a Dog, that is sick of some disease chiefly imputable to the mass of blood, may be cured by exchanging it for that of a sound Dog? And whether a sound Dog may receive such diseases from the blood of a sick one, as are not otherwise of an infectious nature?

9. What will be the Operation of frequently stocking (which is feasible enough) an old and feeble Dog with the blood of young ones, as to liveliness, dulness, drowsiness, squeamishness, &c. *et vice versa*?

10. Whether a small young Dog, by being often fresh stocked with the blood of a young Dog of a larger kind, will grow bigger, than the ordinary size of his own kind?

11. Whether any Medicated Liquors may be injected together with the blood into the Recipient Dog? And in case they may, whether there will be any considerable difference found between the separations made on this occasion, and those, which would be made, in case such Medicated Liquors had been injected with some other Vehicle, or alone, or taken in at the mouth?

12. Whether a Purging Medicine, being given to the Emitter Dog a while before the Operation, the Recipient Dog will be thereby purged, and how? (which Experiment may be hugely varied.)

13. Whether the Operation may be successfully practis'd, in case the injected blood be that of an Animal of another Species, as of a Calf into a Dog, &c. and of a Cold Animal, as of a Fish, or Frog, or Tortoise, into the Vessels of a Hot Animal, and *vice versa*?

14. Whether the Colour of the Hair or Feathers of the Recipient Animal, by the frequent repeating of this Operation, will be changed into that of the Emitter?

15. Whether by frequently transfusing into the same Dog, the blood of some Animal of another Species, something further, and more tending to some degrees of a change of Species, may

be effected, at least in Animals near of Kin; (As Spaniels and Setting Dogs, Irish Grey-hounds and ordinary Grey-hounds, &c.)

16. Whether the Transfusion may be practis'd upon pregnant Bitches, at least at certain times of their gravitation? And what effect it will have upon the Whelps?

There were some other *Queries* proposed by the same Author; as, the weighing of the *Eminent* Animal before the Operation, that (making an abatement for the Effluvia, and for the Excrements, if it voids any) it may appear, how much blood it really loses. To which were annexed divers others, not so fit to be perused but by *Physicians*, and therefore here omitted.

A Method

For Observing the Eclipses of the Moon, free from the Common Inconveniencies, as it was left by the Learned Mr. Rook, late Gresham-Professor of Geometry.

Eclipses of the Moon are observed for two principal ends; One *Astronomical*, that by comparing Observations with Calculations, the *Theory* of the *Moons Motion* may be perfected, and the *Tables* thereof reformed: the other, *Geographical*, that by comparing among themselves the Observations of the same *Ecliptick Phases*, made in *divers* places, the *Difference* of *Meridians* or *Longitudes* of those places may be discerned.

The Knowledge of the Eclipse's Quantity and Duration, the Shadows, Curvity, and Inclination, &c. conduce only to the former of these ends. The exact time of the Beginning, Middle, and End of Eclipses, as also in *Total* ones, the Beginning and End of *Total* darkness, is useful for both of them.

But because in Observations made by the *bare Eye*, these times considerably differ from those with a *Telescope*; and because the *Beginning* of Eclipses, and the *End* of *Total* darkness, are scarce to be observed exactly, even with Glasses (none being able clearly to distinguish between the *True Shadow* and *Penumbra*, unless he hath seen, for some time before, the Line, separating them, pass along upon the Surface of the Moon;) and lastly, because in small

Partial

Partial Eclipses, the Beginning and End, and in *Total* ones of short continuance in the Shadow, the Beginning and End of *Total* darkness, are unfit for nice Observations, by reason of the slow change of *Apparences*, which the *Oblique* Motion of the Shadow then causeth. For these reasons I shall propound a *Method* peculiarly design'd for the Accomplishment of the *Geographical* end in Observing Lunar Eclipses, free (as far as is possible) from all the mentioned Inconveniencies.

For, *First*, It shall not be practicable without a Telescope. *Secondly*, The Observer shall alwayes have opportunity before his principal Observation, to note the Distinction between the *True Shadow* and the *Penumbra*. And, *Thirdly*, It shall be applicable to those Seasons of the Eclipse, when there is the suddenest Alteration in the *Apparences*.

To satisfie all which intents,

Let there be of the Eminentest *Spots*, dispersed over all Quarters of the Moons Surface, a select number generally agreed on, to be constantly made use of, to this purpose, in all parts of the World. As, for Example, those, which *M. Hevelius* calleth,

Mons	{	Sinai.	Insula	{	Besbicus.	Palus	{	Maotis.
		Æthna.						
		Porphyrites.			Creta.			Maraotis.
		Serorum.						Lacus Niger Major.

Let in each *Eclipse*, not all, but (for instance) three of these *Spots*, which then lie nearest to the *Ecliptick*, be exactly observed, when they are first touch'd by the *True Shadow*, and again, when they are just compleatly entred into it, and (if you please) also in the *Decrease* of the Eclipse, when they are first fully clear from the *True Shadow*: For the accurate determinations of which moments of time (that being in this business of main importance) let there be taken *Altitudes* of remarkable *Fixed Stars*, on this
side

side of the *Line*, of such, as lie between the *Aequator* and *Tropick* of *Cancer*; but *beyond* the *Line*, of such, as are situate towards the other *Tropick*; and in all places, of such, as at the time of Observation, are about 4. hours distant from the *Meridian*.

An. Account
of some Observations, lately made in Spain, by
His Excellency the Earl of Sandwich.

THE Right Honourable the *Earl of Sandwich*, as he appears eminent in discharging the Trust, his Majesty hath reposed in him, of Ambassador Extraordinary to the King of *Spain*; so he forgets not in the midst of that Employment, that he is a Member of the *Royal Society*; but does from time to time, when his weighty State-Negotiations do permit, employ himself in making considerable Observations of divers kinds, both *Astronomical* and *Physiological*; and communicateth the same to the said *Society*; as for instance, lately, what he has observ'd concerning the *Solar Eclipse* in *June* last, the *Suns* height in the *Solstice*, and also the *Latitude* of *Madrid*, esteeming by the *Suns* Altitude in the *Solstice*, and by other *Meridian* Altitudes, the *Latitude* of *Madrid* to be 40 deg. 10 min; which differs considerably from that assigned by others; the *General Chart* of *Europe* giving to it 41 deg. 30 min. the *General Map* of *Spain*, 40 deg. 27 min. A large *Provincial Map* of *Castile*, 40 deg. 38 min.

To these particulars, and others formerly imparted, his Excellency is making more of the same nature; and particularly those of the *Immersion* of the *Satellites* of *Jupiter*.

We must not omit mentioning here, what he hath observed of *Halo's* about the *Moon*; which he relates in these words;

Decemb. 25. Old Style, 1666. In the Evening, here (vid. at *Madrid*) was a great *Halo* about the *Moon*, the *Semidiameter* whereof was about 23 deg. 30 min. *Aldebaran* was just in the *North-east* part of the *Circle*, and the two *Horns* of *Aries* just enclosed by the *South-west* of the *Circle*, the *Moon* being in the *Center*. I note this the rather (*saieth he*) because five or six years ago, vid. *Novemb. 21. Old Style, 1661.* an hour after *Sun-set*, I saw a great *Halo* about the *Moon* of the same *Semidiameter*,

at *Tangier*, the Moon being very near the same place, where she was now.

Extract

Of a Letter, lately written by Mr. Nathaniel Fairfax to the Publisher, containing Observations about some Insects, and their Inexiousness, &c.

The Ingenious Author of this Letter, as he expresses an extraordinary desire to see the *Store-house* of *Natural Philosophy*, more richly fraughted (a Work begun by the single care and conduct of the Excellent Lord *Verulam*, and prosecuted by the Joynt-undertakings of the *R. Society*) so he very frankly offers his Service in contributing some of his Observations, and begins in this very Letter to perform his Offer. For, Having taken notice of what was publisht in *Numb. 9. p. 161.* out of the *Italian Philosopher Redi*, vid. That Creatures, reputed Venomous, are indeed no Poysons, when swallow'd, though they may prove so, when put into Wounds: He, for confirmation thereof, alledges Examples of several Persons well known to him (himself also having been an Eye-witness to some such Experiments) who have frequently swallow'd *Spiders*, even of the rankest kind, without any more harm than happens to Hens, Robin-red-breasts, and other Birds, who make *Spiders* their daily Commons. And having made mention of some men, that eat even *Toads*, he adds, that though a Toad be not a Poyson to us in the whole; yet it may invenome outwardly, according to some parts so and so stirr'd; an instance whereof he alledges in a Boy, who stumbling on a Toad, and hurling stones at it, some Juice from the bruised Toad chanced to light upon his Lips, whereupon they swell'd, each to the thickness of about two Thumbs: And he neglecting to use, what might be proper to restore them, they have continued in that mishapen size ever since; the ugliness whereof, when the Relator saw, gave him occasion to inquire after the cause of it, which thereupon he understood to be, as has been recited.

On this occasion, the same Gentleman relates, that once seeing a Spider bruised into a small Glass of Water, and that it tinged it

it somewhat of a Sky-colour, he was, upon owning his surprize thereat, informed, that a dozen of them being put in, they would dye it to almost a full *Azure*. Which is touch't here, that, the Experiment being so easie to make, it may be tried, when the season furnishes those Insects; mean time, it seems not more incredible, that this Creature should yield a Sky-colour, when put in water, than that *Gochineel*, which also is but an Insect, should afford a fine *red*, when steep'd in the same Liquor.

*An Account
Of Some Books.*

I. Le Tome troisieme et dernier des Lettres de *M. DES-CARTES*.

As the two first *Tomes* of *M. Des-Cartes* his Letters, contain Questions, for the most part of a *Moral* and *Physiological* Nature, propos'd to, and answer'd by him; so *this* consists of the Contests, he had upon several Subjects with divers Men eminent in his time.

To pass by that sharp Contest, he was engaged in by some Professors of Divinity at *Utrecht*, who endeavoured to discredit his Philosophy, as leading to Libertinisme and Atheisme, notwithstanding he made it so much his business, as to assert the Existence of a Deity, and the Immortality of a Soul: We shall take notice of what is more to our purpose, *vid.* the Differences, he had touching his *Dioptricks* and *Geometry*.

As for his *Dioptricks*, though a great part of the Learned World have much esteem'd that Treatise, as leaving little to be said after him upon that Subject; yet there have not been wanting Mathematicians, who have declared their disagreement from his Principles in that Doctrine. The first of them was the Jesuit *Bourdin*, Mathematick Professor in the Colledg of *Clermont* at *Paris*; but this difference was soon at an end. A second was Mr. *Hobbs*, upon whose account he wrote several Letters to *Mersennus*, containing many remarks conducing to the Knowledge of the Nature of *Reflection* and *Refraction*. But the Person, that did most learnedly and resolutely attack the said *Dioptricks*, was Monsieur *Fermat*,
writing

writing first about it to *Mersennus*, who soon communicated his Objections to *M. Des-Cartes*, who failed not to return his Answer to them. But *Fermat* replied, and *Des-Cartes* likewise; and after many reciprocations, in which each party pretended to have the advantage; the matter rested; until *M. Fermat* taking occasion to write afresh of it to *M. De la Chambre*, several years after *Des-Cartes*'s death, upon occasion of a Book, written by *M. De la Chambre*, *Of Light*; discoursed with this new *Author* after the same rate, as he had done before with *Des-Cartes* himself, and seemed to invite some-body of his friends, to re-assume the former contest. Whereupon *M. Clerfeliér* and *M. Robault* took up the Gantlet, to assert the Doctrine of the deceased Philosopher, exchanging several Letters with *M. Fermat*, all inserted in this *Tome*, and serving fully to instruct the Reader of this Difference, and withal to elucidate many difficult points of the Subject of *Refractions*; especially of this particular, *Whether the Motion of Light is more easily, and with more expedition, perform'd through dense Mediums, than rare.*

Besides this, though one would think, Disputes had no place in *Geometry*, since all proofs there, are as many Demonstrations; yet *M. Des-Cartes* hath had several scuffles touching that Science. As *M. Fermat* had assaulted his *Dioptricks*, so He reciprocally examined his Treatise *De Maximis & Minimis*, pretending to have met with *Paralogismes* in it. But the Cause of *M. Fermat* was learnedly pleaded for, by some of his Friends, who took their turn to examine the Treatise of *Des-Cartes*'s *Geometry*; whereupon many Letters were exchanged, to be found in this Book, and deserving to be considered; which doubtless the Curious would easily be induced to do, if Copies of this Book were to be obtain'd here in *England*, besides that one, which the *Publisher* received from his *Parisian* Correspondent, and which affords him the opportunity of giving this, though but Curfory, Account of it.

As to *Physicks*, there occur chiefly two Questions, learnedly treated of in this *Volume*, though not without some heat between *M. Des-Cartes* and *M. Roberval*. The one is, touching the Vibrations of Bodies suspended in the Air, and their Center of Agitation: about which, there is also a Letter inserted of

M. *Des-Cartes* to that late Noble and Learned English Knight, Sir *Charles Cavendish*. The other is, whether Motion can be made without supposing a *Vacuum*: where 'tis represented, That, if one comprehend well the Nature, ascribed to the *Materia subtilis*, and how Motions, called *Circular*, are made, which need not be just *Ovals* or *true Circles*, but are only called *Circular*, in regard that their Motion ends, where it had begun, whatever irregularity there be in the Middle; and also, that all the Inequalities, that may be in the Magnitude or Figure of the parts, may be compensated by other inequalities, met with in their Swiftneſs, and by the facility, with which the parts of the *Subtle Matter*, or of the first *Cartesian* Element, which are found every where, happen to be divided, or to accommodate their Figure to the Space, they are to fill up: If these things be well understood and considered, that then no difficulty can remain touching the Motion of the parts of Matter *in pleno*.

Besides all these particulars, treated of in this *Tome*, there occur many pretty Questions concerning *Numbers*, the *Cycloid*, the manner of *Working Glasses for Telescopes*, the way of *Weighing Air*, and many other Curiosities, Mathematical and Physical.

II. ASTRONOMIA REFORMATA, *Auctore*
JOHANNE BAPT. RICCIOLI, *Soc.*
Fesv.

For the Notice of this Book, and the Account of the Chief Heads contained therein, we are obliged to the *Journal des Sçavans*; which informs us,

First, That the Design of this Work is, that, because several *Astronomers*, having had their several *Hypotheses*, there is found so great a diversity of opinions, that it is difficult thence to conclude any thing certain; this Author judged it also necessary, to compare together all the best Observations, and upon examination of what they have most certain in them, to reform upon that measure the Principles of *Astronomy*.

Secondly, That this *Volume* is divided into two Parts; whereof the *First* is composed of *Ten Books*; in which the Author
confi-

considers the principal Observations, hitherto made of the Motion of the Planets and the Fixed Stars, of their Magnitude, Figure, and other Accidents; drawing thence several Conclusions, in which he establishes his *Hypothesis*. The *Second* contains his *Astronomical Tables*, made according to the *Hypotheses* of the First Part, together with Instructions teaching the manner of using them.

Thirdly, That Astronomers will find in this Book many very remarkable things, concerning the *Apparent Diameter of the Sun* and the other Stars, the Motion of the *Libration of the Moon*, the *Eclipses*, *Parallaxes*, and *Refractions*: And that this Author shews, that there is a great difference between *Optical* and *Astronomical* Refraction, which *Tycho* and many others have confounded; undertaking to prove, that, whereas these *Astronomers* have believed, that the remoter any Star is, the less is its Refraction, on the contrary the Refraction is the greater, the more a Star is distant. And among many other things, he ingeniously explicates the two contrary Motions of the Sun, from East to West, and *vice versa*, by one onely Motion upon a *Spiral*, turning about a *Cone*.

Fourthly, That he represents, How uneasy it is to establish sure Principles of this Science, by reason of the difficulties of making exact Observations. So, for example, in the Observation of the *Equinox*, every one is mistaken by so many *Hours*, as he is of *Minutes*, in the Elevation of the *Pole*, or the Diameter of the Sun, or the Refraction, or in any other circumstance. In the Observation of the *Solstice*, the error of one only *Second* causeth a mistake of an *Hour* and an *half*: mean time 'tis almost impossible to avoid the error of a *Second*; and even the sharpest sight will not be able to perceive it, except it be assisted with an Instrument of a prodigious bigness. For to mark *Seconds*, though Lines were drawn as subtil as the single threds of a Silk-worms Clew, (which are the smallest spaces to be discerned by the sharpest Eye) by the Calculation made by this Author there would need an Instrument of 48. feet *Radius*, since Experience shews, that there needs no more at most, than 3600. threds of Silk to cover the space of an *inch*. But, suppose one could have a *Quadrant* of this bigness, who can assure himself, that dividing it into

324000. parts (for so many *Seconds* there are in 90. *Degrees*) either in placing it, or in observing, he shall not mistake the thickness of a single thred of Silk? He adds, that Great Instruments have their defects, as the small ones: For in those, that are *Movable*, if the thred, on which the Lead hangs, is any thing big, it cannot exactly mark *Seconds*; if it be very fine, it breaks, because of its great length, and the weight of the Lead: And in the *Fixed* ones, the greater the *Diameter* is, the less the Shadow or the Light is terminated; so that it is painful enough, exactly to discern the extremities thereof. Yet 'tis certain, that the greater the Instruments are, the surer *Astronomers* may be: Whence it is, that some *Astronomers* have made use of *Obelisks* of a vast bigness, to take the *Altitudes*; and Signior *Cassini*, after the example of *Egnatio Dante*, caused a hole to be made on the highest part of a Wall of 95. feet in a Church at *Bononia*, through which the beams of the Sun falling on the Floor, mark as exactly as is possible, the height of that Luminary.

Fifthly, That the Author reasons for the *Immobility of the Earth* after this manner. He supposes for certain, that the swiftness of the Motion of heavy bodies doth still *increase* in their descent; to confirm which principle, he affirms to have experimented, That, if you let fall a Ball into one of the Scales of a Ballance, according to the proportion of the height, it falls from, it raiseth different weights in the other Scale. For example, A Wooden Ball, of $1\frac{1}{2}$ ounce, falling from a height of 35 inches, raiseth a weight of 5. ounces; from the height of 140 inches, a weight of 20 ounces; from that of 315 inches, one of 45 ounces; and from another of 560 inches, one of 80 ounces, &c. From this principle he concludes the Earth to be at Rest; for, *saieth he*, if it should have a Diurnal Motion upon its Center, Heavy Bodies being carried along with it by its motion; would in descending describe a *Curve Line*, and, as he shews by a *Calculus*, made by him, run equal spaces in equal times; whence it follows, that the Celerity of their Motion would not increase in descending, and that consequently their stroke would not be stronger, after they had fallen thorow a longer space.

III. ANATOME MEDULLAE SPINALIS,
ET NERVORUM *inde provenientium*,
GERARDI BLASII, M. D.

The Author shews in this little *Traët* a way of taking the entire *Medulla Spinalis*, or Marrow of the Back, out of its *Theca* or Bony Receptacle, *without Laceration*; which else happens frequently, both of the Nerves proceeding from it, and of the Coats investing it; not to name other parts of the same. This he affirms to have been put into practice by himself, by a fine Saw and Wedge; which are to be dexterously used: and he produceth accordingly in excellent Cuts, the Representations of the Structure of the said *Medulla* thus taken out, and the *Nerves*, thence proceeding; and that of several Animals, Dogs, Swine, Sheep.

He intermixes several Observations, touching the *Singleness* of this *Medulla*, against *Lindanus* and others; its *Original*, vid. Whether it be the Root of the Brain, or the Brain the Root of it: its difference of *Softness* and *Hardness* in several Animals; where he notes, that in *Swine* it is much softer than in Dogs, &c.

He exhibits also the Arteries, Nerves, and Veins, dispersed through this *Medulla*, and inquires, Whether the *Nerves* proceed from the *Medulla* it self, or its *Meninx*; and discourses also of the *Principle* and *Distribution* of the Nerves; referring for ampler information in this and the other particulars, to that Excellent Book of the Learned Dr. *Willis*, *De Anatomia Cerebri*.

Advertisement.

Advertisement.

It was thought fit to publish here the following Advertisement of John Evelyn Esquire, and that as himself proposed it. Viz.

BEing much solicited by many worthy Persons, to publish a *Second Edition* of my Discourse and Directions concerning *Timber, &c.* which was printed at the Command and by the Encouragement of the *R. Society*, I do humbly request, that if any Person have any Material Additions or Reformati^ons, which he thinks necessary either to the Part, which concerns the Improvement of *Forrest-Trees*, or that of *Cider*, he would be pleased to communicate his Notes and Directions to Mr. *H. Oldenburgh*, one of the Secretaries of the said Society, at his House in the *Palmal* of *St. James's Fields Westminster*, with what speed they conveniently can, before our *Lady-day* next, to be inserted into this intended *Edition*.

Note,

What was observed, Numb. 20. p. 364. l. 18. of the Number of Vegetables, (vid. That they are about 410.) found in England; and catalogued by Dr. Merret in his Pinax, &c. is to be understood only of the different Kinds of Plants, not of the several sorts of several Plants; for, these being comprised, the Number will amount to about 1400.

THE PHILOSOPHICAL TRANSACTIONS OF

Two Years, 1665 and 1666, beginning *March 6. 1665.*
and ending with *February 1666* ; abbreviated in an

ALPHABETICAL TABLE:

And also afterwards Digested into a more
NATURAL METHOD.

In the TABLE, the first *Figure* signifies the *Number*
of the *Tracts*: the second, the *Page*, as it is re-
marked in the same.

A.
Agriculture, Heads of Inquiries con-
cerning it, *num. 5. pag. 91.*
Air. The weight of it in all chan-
ges, by wind, weather, or what-
ever other influence observable
by a standing *Mercurial Balance*, call'd a
Baroscope, hinted in reference to M. *Hook's*
Micrography, *n. 2. p. 31.* applied to parti-
culars by Dr. *Beale*, *9. 153.* with additions,
10. 163. described with observables rela-
ting to an Earth-quake about *Oxford* by Dr.
Wallis, *10. 167.* Mr. *Boyle's* remarks on
the same, *11. 181.* The *Wheel-Baroscope*
improved and delineated by M. *Hook*, *13.*
218. Another Balance of the Air contriv'd
by M. *Boyle*, and call'd *statical*, by which
the former may be exactly stated and ex-
amin'd for many particular applications, *14.*
231.
Anatomy, see *Flesh, Blood, Animals, Lungs,*
Petrification, Taste; item, *Steno, Graeff,*
Bellin; *Redi*, in the *Liste of Books.*
Animals; one may live by the blood of an-
other, the whole mass of his own blood be-
ing drawn out, and the blood of another in-
fus'd in the mean time, *20. 353.* See *Bloods*

Transfusion. The Generation and Functi-
ons of Animals deduced by Mechanical
principles, without recourse to a *substantial*
form, *18. 325.* See *Honor. Fabri. & n.*
20. p. 365. See also *Guarini.*
Artificial Instruments or Engins. To weigh
Air, see *Baroscope*, or rather *Air.* To dis-
cern drought or moisture of the *Air*, see *Hy-*
groscope. n. 2. p. 31. applicable in the ob-
servation of *Tydes*, *17. 300.* *Thermometers*,
to measure degrees of heat and cold, *2. 31.*
described, *10. 166.* applied in the examina-
tion of *Tydes*, *17. 300.* An Instrument for
graduating *Thermometers*, to make them
Standards of heat and cold, *2. 31.* A new
Engine for grinding any *Optick Glasses* of a
Spherical figure, *2. 31.* To measure the
Refractions of Liquors of all kinds, for
establishing the Laws of Refraction, *2. 32.*
To break the hardest Rocks in *Mines*, *5. 82.*
To try for *fresh* waters at the bottom of the
Seas, *9. 147.* To find the greatest depths
in the *Sea*, *9. 147.* The *Engin* for fetching
up *fresh* water defended by Explication, *13.*
228. *Huge Wheels*, and other Engins for
Mines, *2. 23.* By the fall of water to blow
wind, as with *Bellows*, *2. 25.*

Astro-

Astronomical Remarks of a New Star seen by *Hevelius* in *Pectore Cygni*, which he supposeth to be the same, which *Kepler* saw A. 1661. and continued until 1662. and was not seen again till 1662. and then almost always hiding it self till 24. Nov. 1666. That, seen by *Kepler* was of the third magnitude; this now, of the sixth or seventh. 2. Whether it changes place and magnitude, 19. 349. The *Scheme*, 21. 372. A *New Star* in *Collo ceti*, observ'd from 1638. to 1664, 1665, 1666. with its vicissitudes and periods, and causes of change, open'd by *Bullialdus*, who conceives the bigger part of that round body to be obscure, and the whole to turn about its own Center, 21. 382. Another *New Star* call'd *Nebulosa* in *Cingulo Andromedæ*, seen when the Comet appear'd 1665. observ'd by the said *Bullialdus* to appear and disappear by turns, *ibid.* 383. A method for observing the *Eclipses of the Moon*, free from the common Inconveniences, by *M Rook*, 22. 387.

B.

B *aroscope*. See *Air* and *Artificial Instruments*.

Blood. The new Operation of *Transfusing* blood into the veins, out of one Animal into another; with considerations upon it, 20. 353. The first Rise of this Invention, 7. 208. The Success, 19. 352. Proposals and Queries, for the improvement of this Experiment, by *M. Boyle*, 22. 385, 386.

Little Blood-letting in China, 14. 249. Blood found in some mens veins like Milk, or of the colour of Milk, 6. 100. again p. 117. 118. and again 8. 139.

A *Boles* in Hungary good as *Bole Armenick*, 1. 11.

The *Bononian Stone*, see *Light* or *Stone*, 21. 375.

Bo ks abbreviated, or recited :

Laur. Bellinus de *Gustûs Organo* novissimè deprehenso, 20. 366. abbrev.

Ge. h. Blasii *Anatome Medullæ Spinalis & Nervorum inde procedentium*, abbrev. n. 22.

Mr. Boyle of *Thermometers* and *History of Cold*, abbrev. 1. 8. more 3. 46.

— His *Hydrostatical Paradoxes* abbrev. 8. 145. more largely 10. 173.

— His *Origin of Forms and Qualities*, 8. 145. abbreviated 11. 191.

Monfieur de Bourges his *Relation of the Bishop of Beryte* his *Voyages in Turkey, Persia, India*, abbrev. 18. 324.

Bullialdi *Monita duo*, abbrev. 21. 381. See sup. à *Astronomy*.

Des Cartes his *Third Volume of Letters*, n. 22.

De la Chambre's Causes of the inundation of the Nile, abbr. 14. 251.

Cordemoy of the difference of *Bodies* and *Souls*, or *Spirits*, and their operation upon one another, abbrev. 17. 306.

Euclid's Elementa Geometrica novo ordine demonstrata, 15. 261.

Hon. Fabri Soc. Jes. *Tract. duo* 1. de *Plantis & Gener. Animalium*. 2. de *Homine*; abbreviated, 18. 325.

Felibien of the most excellent *Paintings*, 21. 383.

Catalogue of Fermats Writings, and his character, 1. 15.

De Graeff, de succi *Pancreatici* natura & usu, abbrev. 10. 178.

Guarini *Placita Philosophica*, abbreviated, 20. 365.

Hevelius his *Prodromus Cometicus*, abbrev. 6. 104. His *Descriptio Cometica cum Manissa*, abbrev. 17. 301.

Hobbes de *Principiis & Ratione Geometrarum*, described, 14. 193. Animadverted upon by *Dr. Wallis*, 16. 289.

Hook's *Micrographical and Telescopic Observations*, *Philosophical Instruments and Inventions*, abbr. 2. 29.

Kircher's *Mundus Subterraneus*, abbrev. 6. 109.

Lower's *Vindication of Dr. Willis* de *Febribus*, 4. 77.

Meret's *Pinax Rerum Naturalium Britannicarum*, continens *Vegetabilia*, *Animalia & Fossilia*, in hac insula reperta, inchoatus; abbr. 20. 364.

Parker's *Tentamina Physico Theologica*, abbrev. 18. 324.

Redi an Italian Philosopher, of *Vipers*, abbrev. 9. 160.

Ricciolo's *Astronomia Reformata*, *Volumen quartum* abbrev. n. 22.

Smith of *K. Solomon's* *Pourtraicture of Old Age*, 14. 254.

Stetoni de Musculis & Glandulis observatio-
num Specimen; cum duabus Epistolis A-
natomicis; abbrev. 10. 176.

Sydenhami Methodus Curandi Febras, ab-
brev. 12. 210.

Thevenot's Relation of curious Voyages, with
a Geographical description of *China*, abbr.
14. 248.

The English *Vineyard* vindicated, 15. 262.

Isaac Vossius de Origine Nili, abbreviated,
17. 304.

Plug-Beig great Grand-child to the famous
Tamerlane, his Catalogue of fix'd Stars, with
their Longitudes, Latitudes, and Magni-
tudes, taken at *Samarcand*, A. 1437. Tran-
slated out of a *Persian* M. S. by M. *Hyde*,
Keeper of the Bodlejan Library, 8. 145.

The *Burning* Concave of *M. de Vilette* in
Lyons, burning and melting any matter (very
few excepted.) What, and How, and at
what distance. The proportion; and compar-
ed with other rare burning Concaves, 6.
96.

C.

IN *China* very ancient Books found of the
nature and vertues of Herbs, Trees and
Stones, 14. 249.

The Root there called *Genseng*, very resto-
rative and cordial, recovering agonizing per-
sons, sold there each pound for three pounds
of silver, 14. 249.

China Dishes how made there, *ibid*.

A way found in *Europe* to make *China*-Dishes,
7. 127.

Chymists in *China* pretend to make Gold, and
promise Immortality, 14. 249.

Cold, see *M. Boyles* History, abbrev. More
Inquiries, and some answers touching *Cold*,
19. 344. How *Cold* may be produced in
hottest Summers by *Sal Armoniack*, disco-
vered by *M. Boyle*, 15. 255. Some suggesti-
ons for remedies against *Cold*, by *D. Beale*,
21. 379.

Comets. The motions of the Comet of *De-
cemb.* 1664. predicted, 1. 3. *Cassini* con-
curs; 2. 17. *Auzout*, who first predicted
the motion, reflects upon *Cassini*, 2. 18. and
predicts the motions of the second Comet
of *March, April* 1665. n. 3. 36.

Controversies and Discourses, some at large, con-
cerning *Comets*, n. 1. p. 3. n. 2. p. 17, 18.
n. 3. p. 36. n. 6. p. 104. n. 9. p. 150.

n. 17. p. 301. Many considerable abbrevi-
ated, n. 6. p. 104. n. 17. p. 301.

D.

D*amps* in Mines pernicious, 3. 44. and
how killing, *ibid*.

Directions for Seamen bound for far Voyages,
by *M. Rook*, 8. 140. *Mr. Boyles* Inquiries,
18. 315.

Philosophical *Directions* or Inquiries for such
as Travel into *Turky*, 20. 360.

Directions, or general Heads for a natural Hi-
story of a Countrey, by *M. Boyle*, 11.
186.

Directions or Inquiries concerning *Mines*, by
the same, 19. 330.

Diamonds where, and how the fairest are dis-
cover'd, 18. 327.

E.

THe *Earthquake* about *Oxford*, Anno
1665. described by *D. Wallis*, 10. 181.
by *M. Boyle*, 11. 179. noting the Con-
comitants thereof by *Baroscope* and *Thermo-
meter*.

The *Earth's* Diurnal motion prov'd by the
motion of the *Comets*, 1. 6. & 7. especially
by the slow motion of the second Comet, 3.
39. See *M. Auzout*, confirm'd by *M. He-
velius*, 6. 105. confirm'd also by the *Tydes*
at Sea, 16. 265.

The *Eclipse* of *June* 22. 1666. accurately
observ'd at *London*, 17. 245. at *Madrid*,
ibid. at *Paris*, 17. 246. at *Danzick*,
drawn in accurate Cuts, n. 19. 347. n. 21.
p. 369.

Elephants: How to escape, or to combat with
them, 18. 328.

Eeles discover'd under Banks in Hoar-Frosts,
by the Greens of the Banks approaching, 18.
383.

F.

THe *Fleshy* parts of the Body which are
usually reputed, and do seem void of
Vessels, are argued to be full of Vessels,
by *D. King*, 18. 316.

Friction and sometimes *Touch*, how sanative,
by several Examples, 12. 206.

Frictions much used by Physicians in *China*
with good success, 14. 249.

G.

Geometricians censur'd by M. Hobbs, 14. 153. defended by D. Wallis, 16. 289.

The method of teaching *Geometry* reform'd, 15. 261. See *Euclid's Elementa novo ordine*, among the Books.

I.

Inquiries, see Directions, *supra*.

Ice and *Snow* how to be preserv'd in *Chasse*, and how *Snow-houses* are made in *Livorn*, 8. 139.

Insects, in swarms pernicious in some Countries; the cause of them, and what Remedies, 8. 139. some *Insects*, commonly believed poisonous, not so, by M. Fairfax, n. 22.

To find the *Julian* period by a new and easie way, 18. 324.

Jupiter's Rotation by degrees discover'd in *England* and *Italy*, n. 1. p. 3. n. 4. p. 75. n. 8. p. 143. n. 9. p. 173. n. 12. p. 209. n. 14. p. 245.

K.

Kermes, how gather'd and used for *Coloration*, describ'd with many considerations, 20. 362.

L.

Light, to examine what figure or celerity of motion begetteth or increaseth *Light* or *Flame* in some Bodies, by D. Beale, 13. p. 226. *Shining* Worms found in *Oysters*, 12. 203. The *Bononian* Stone duly prepar'd continues *light* once imbibed above any other substance yet known amongst us, 21. 375. The loss of the way of preparing the same for shining, feared, *ibid*.

Longitudes at Sea, how to be ascertain'd by *Pendulum-Watches*, 1. 13.

Lungs and *Windpipes* in *Sheep* and *Oxen* strangely stop't with *Hand-Balls* of *Grass*, 6. 100.

M.

Marbles, that a liquor may be made to colour them, piercing into them, 7. 225.

Mars, by what steps and degrees of diligence discover'd to be turbinated, both in *England* and *Italy*. Compare n. 10. p. 198. and n. 14. 239, 242. see the Schemes there.

May-dew examin'd by various Experiments, by M. Henshaw, 3. 333.

Mechanical Principles in a Geometrical method, explicating the nature or operation of *Plants*, *Animals*, 8. 325.

Medecins in *China* consist for the most part of *Simples*, *Decoctions*, *Cauteries*, *Frictions*, without the use of *Blood-letting*, 14. 249. The *Physicians* there, commended for speedy Cures, and easie, *ibid*.

Mediterranean Sea, whether it may be join'd with the *Ocean*, debated, 3. 41.

Micrography epitomized, 2. 27. M. *Auzout's* Objections to a part of it; *vid*. the new way of grinding *Spherical Glasses* by a *Turn-lath*, 4. 57. M. *Hook's* answer thereunto, 4. 64. both at large.

Mercury-Mines in *Eriuli*, and the way of getting it out of the earth, 2. 21.

Mineral Inquiries, see Directions, *Engins*, *Artificial* Instruments. *Mineral* at *Liege* yielding *Brimstone* and *Vitriol*; and the way of extracting them, 3. 35. How *Adids* and *Mines* are wrought at *Liege*, 5. 79. A *Stone* in *Sueden* yielding *Sulphur*, *Vitriol*, *Allum* and *Minium*, and how, 21. 375. See *Kircher's* *Mundus Subterraneus* abbr. 6. 109.

Monsters, a *Calf* deform'd, and a great stone found in a *Cows* womb, n. 1. 10. a *Cole* with a double eye in one place, 583.

Moons Diameter how to be taken, and why increased in the *Solar Eclipse* of *Jun*. 22. 1666. n. 2. p. 373. see *Planets*. What discoverable in the *Moon*, and what not. *Moons* *Eclipses* how to take without inconvenience, 457.

Mulberry-Trees how to be cut low, and easie to be reach'd, for relief of *Silk-worms*, in *China*, 14. 249. in *Virginia*, 12. 202. see *Silk*.

N.

Nile's Inundations, the cause attributed to *Niter*, by *Dela Chambre*; opposed by *Vossius*. See both in the *List of Books*, 14. 251. and 17. 304.

The *North-Countries* of *Poland*, *Sweden*, *Denmark*, &c. are warm'd by the influence of the *Royal Society*, 19. 344.

O. Ocean.

O.

Ocean, what Seas may be joined with it, 3. 41.

Opticks, Campani's Glasses do excell Divini's; 'tis easie by them to distinguish people at four Leagues distance, 2. 131. and 12. 209. What they discover in *Jupiter* and *Saturn*, 1. 1. and 2. The proportions of Apertures in Perspectives reduced to a Table by *M. Aurout*, 4. 55. Animadverted upon by *M. Hook*, 4. 69.

How to illuminate Objects to whatsoever proportion, proposed by *M. Aurout*, 4. 75.

Hevelius, *Hugenius*, and some in *England*, endeavour to improve Optick Glasses, 6. 98.

Seigneur *Burattini*'s advance in the same inquired after, 19. 348. some answer to it from *Paris*, 21. 347.

Divini makes good Optick Glasses of Rock-chrystal, that had veins (if he mistook not somewhat else for veins) 20. 362.

To measure the distances of Objects on earth by a Telescope, undertaken by *M. Aurout*, and others of the *Royal Society*, 7. 123.

How a Telescope of a few feet in Diameter may draw some hundreds of feet, 7. 127.

How a Glas of a small convex-sphere may be made to reflect the Rayes of Light to a Focus at a far greater distance than is usual, 12. 202.

P.

Parsley, to make it shoot out of the ground in a few hours, see *Hon. Fabri* 18. 325.

Pictures, a curious way in *France* of making lively Pictures in Wax, and Maps in a low relieve, 6. 99.

The cause why **Pictures** seem to look upon all Beholders, on which side soever they place themselves, 18. 326.

Ancient **Paintings** compar'd with the Modern, and a judgment of the **Paintings** in several Ages, their perfections, and defects, see *M. Felibien*, 21. 383.

Petrification, in the wombs of Women, 18. 320. in a Calf in the Cows womb, 1. 10. **Stones** found in the heart of the Earl of *Belcarri*, 5. 86. Part of an Elm by incision, or otherwise, *petrified* a foot above the root and ground, 19. 329. Wood *petrified* in a sandy ground in *England*; and of

a Stone like a Bone or *Osteocolla*, 5. 101. A Stone of excellent virtues found in the head of a Serpent in the *Indies*, 6. 102. The causes of *Petrification* inquired, 18. 320.

Planets, see *Jupiter*, *Mars*, *Saturn*, *Sun*, *Moon*; which are tubinated, and which not, 8. 143. To find the true distances of the *Sun* and *Moon* from the earth, 9. 191. **Physicians** of *China* commended, see *Medecins*.

Preservation, to preserve small Birds taken out of the shell, or other *Fatu's*, for discoveries, 12. 198.

Pulses of the Sick how diligently, and to what good purposes observ'd in *China*, 14. 249.

R.

Rainbows strangely posited, 13. 219. **Raining** of Ashes, and how, 21. 377. **Rice** p ospers best in watery places, see *Marrishet*, 18. 328.

S.

Salamander, how it extinguishes fire, and feeds by licking *Indian* earth, 21. 377. **Salt** by excessive use stiffens, and destroys the body, 8. 138.

Salt-Springs, see *Springs*.

Salt-Peeter how made in the *Mogols* Dominions, 6. 103.

The proportion of **Salt** in best Salt-Springs; and what grounds or signs of best **Salt**, 8. 136.

Sea-fluxes, the cause proposed by way of a new Theory, by *Dr. Wallis*, 16. 263. see *Tydes*.

Seas, whether they may be united, 3. 41.

Silk-Worms and **Silk-Trade** solicited, 5. 87. and 2. 26. and 12. 201.

Snakes, how they differ from *Vipers*, 8. 138.

Rattle-Snakes, how sometimes kill'd in *Virginia*, 3. 43. and 4. 78.

Snow-houses directed, and how to preserve Ice and **Snow** in Chasse, 8. 139.

Springs, of peculiar note, n. 7. 127. n. 8. 133. 135. and 136. n. 18. 323.

T.

Thee, in *China* and what ; and how exchanged
there for dried leaves of Sage by the *Dutch*,
14. 249.

W.

T *Asse*, the Organ and Nature of it, 20.
366.

Thunder and *Lightning*, the Effects examined,
n. 13. 222. n. 14. 247.

Tydes, the causes proposed, 16. 263. See a
further examination by a severe History of
Tydes, *Winds*, and other circumstances di-
rected, n. 17. n. 18. n. 21.

Trees of *Oak* how found under-ground in
Moors or *Marishes*, 18. 323.

W *Hale-fishing* about *Bermudas*,
and *New-England*, how it is
performed, n. 1. 11. n. 8. 132.

Wind, how to be raised by the fall of water,
without any *Bellows*, 2. 25. shewed in a
draught.

Worms, that eat holes in stones, feeding on
stone, 18. 321.

THE

The more

NATURAL METHOD.

A Natural History of all Countries and Places, is the foundation for solid Philosophy, *See* Directions, Inquiries, and Instructions for a Natural History of a Country, *n.* 11. *p.* 186.

See it in part exemplified in the *History of England*, begun by Dr. Merrett in his *Pinnax*, 20. 364.

See the cause of Tydes proposed by D. Wallis, 16. 263.

See the further Examination by a severe History of Tydes, Winds, and other Concomitants or Adherents, directed, *n.* 17. *n.* 18, *n.* 21.

See the Inquiries concerning the Seas, and Sea-waters, *n.* 18. 315.

See Directions for Seamen bound for far Voyages, 8. 140.

Kircher's Account of the Subterraneous World, 6. 109.

Mr. Boyle's Directions and Inquiries touching Mines, 19. 330.

Philosophical Directions and Inquiries for such as Travel into Turkey, *n.* 20. 300.

The Relation of M. de Bourges, 18. 324.

M. Thevenots Relation of divers curious Voyages, &c. more particularly of China, 24. 248.

The causes of the inundation of the Nile, disputed by Dela Chambre and Vossius. In the *List of Books*.

See Mr. Boyle's Mechanical Deductions, and Chymical Demonstrations of the *Origine of Forms and Qualities*, 11. 191.

See the Application of these Mechanical Principles more particularly to the Nature, Operation, and Generation of Plants and Animals, and to our humane Contexture, in a Geometrical method, by Hon. Fabri, 18. 325.

See Mr. Boyle's History of Cold and Thermometers, *n.* 1. *p.* 8. *n.* 3. *p.* 46.

The History of Winds and Weather, and all changes of the Air (especially in relation

to the weight) observable by the Baroscope, *n.* 9. *n.* 10, *n.* 11.

Light, some special search into the causes, and some peculiar Examples. *See* above in *Light*.

Petrification solicited, *see* Petrification, Stone.

The Earths Diurnal Rotation, *see* Earth *suprà*.

Adventurous Essayes in Natural Philosophy, *see* Guarini, 20. 365.

Earthquakes, and their Concomitants observed, *n.* 10. *n.* 11.

The effects of Thunder and Lightning examin'd, *see* Thunder, *n.* 13. 222. *n.* 14. 247.

The raining of Ashes and Sand at great distance from the Mount Vesuvius, *see* Raine, 21. 377.

Springs, and Waters of peculiar Note, *see* Springs.

Insects in Swarms how begotten; pernicious, and how destroyed, 8. 137.

Monsters, or Irregularities in Nature. The Calf, Colt, *suprà*.

Four Suns at once, and two strange Rainbows, 13. 219.

See the statical position and tendency or gravitation of Liquids, in Mr. Boyle's *Hydrostatical Paradoxes*, 8. 145.

See in M. Hooks Micrography, a History of minute Bodies, or rather of the minute and heretofore un-seen parts of Bodies; it being a main part of Philosophy, by an artificial reduction of all gross parts of Nature to a closer inspection.

Medicinals, *see* Medicine. Physicians, China. Friction, Dr. Sydenham. Dr. Lower, Friction, *suprà*. *n.* 4. 77. *n.* 12. 206.

Anatome, *see* Steno de Musculis & Glandulis. How a juyce in the stomach dissolves the shells of Crustacees, *ibid.*

Graeff de Succo Pancreatico; that Flesh hath Vessels, 18. 316. Blood degenerated to resemble milk, *n.* 6. 117. The Transfusion

of blood, 20. 353. The organ and nature
of *Taste*, 20. 366.
Salt too much stiffens and destroys the Body,
8. 138.

II. Singularities of Nature severely examin'd.

The ordering of *Kermes* for Color, n. 20. 362.
How the *Salamander* quencheth Fire, and
lives by licking the Earth. n. 21. 377.
Whether Swallows do lie under water in Win-
ter, and revive in Summer? n. 19. 350.
Whether the *Hungarian Bolus* like the *Arme-
nus*? 1. 11.
Rattle-Snakes how kill'd in *Virginia*, 3.
43.
Snakes and *Vipers* how they differ, see
Snakes above.
The Qualities and Productions of *May-dew*,
3. 1.
Damps in Mines how they kill, 3. 44.
Teeth growing in aged persons, 21. 380.
Steams and Expirations of the Body how
stopp'd; and the stoppage dangerous or
mortal, 8. 138.
Shining Worms in Oysters, 12. 203.

III. Arts, or Aids for the discovery or use of things Natural.

See Artificial Instruments in the Table.
Agriculture, see the Inquiries, 5. 91.
English Vineyards vindicated, see in the *Cata-
logue of Books*.
Geometry, see *Euclid* methodized for Facili-
ty, *Fermat*: in the *Catalogue of Books*.
Astronomy, see Astronomical Remarks. *Bul-
lialdus*, *Hevelius*, Comets, Planets, Sa-
turn, Jupiter, Mars, Sun, Moon, Eclip-
ses.
Opticks, see that Head in the Table.

Picture, see that Head in P. and *Felibien* in
the *Catalogue of Books*.
How to paint Marbles within, see the
Head *Marble*.

Pendulum-Watches to ascertain Longitudes
at Sea, 1. 13.

Whale-fishing about *Bermudas*, 1. 17. and
8. 132.

Silk-trade solicited in *France*, *Virginia*, see
Silk in the Table.

Bees how to be found in Frosts, 17. 323.

Winds raised to blow by the fall of water
without Bellows, 2. 25. shew'd in a *Cutt*.

Elephants enraged, how to escape or subdue,
18. 328.

Seas and vast waters, whether they may be uni-
ted to the main Ocean, 3. 41.

To proportion the distance necessary to burn
Bodies by the Sun; and shewing, why the
Reflections from the Moon and other Pla-
nets do not burn, 4. 69.

The Art of making *Salt-Peter*, as practised
in the *Mogols* Dominions, 6. 103.

To make *China-Dishes*, 14. 249. expected
from *Seigneur Septatio* to be made in *Eu-
rope*, 7. 127.

To convey blood of one Animal, or other Li-
quors, into the blood of another Animal,
20. 353.

To preserve Ice and Snow by *Chasse*, 8. 138.

To preserve Ships from being Worm-eaten,
11. 190.

To preserve Birds taken out of the Eggs, or
other small *Fetuss*s, for Anatomical, or o-
ther Discoveries, 12. 199.

To allay the heat in hottest Summer, for Diet
or Delight, 15. 255.

Remedies against extream Cold suggested, 21.
379.

Trees of Oak as black as Ebony discover'd,
and taken up out of Moors and Marshes in
draughy weather, 11. 323.

Note,

That though in this last Head there is repeated the *Transfusion*
of Blood, because the Operation is an Art requiring diligence,
and a practised hand to perform it for all advantageous Discoveries,
and so to be distinguish'd from the *Anatomical* Account; yet that
there is not affected noise and number, may well appear by review-
ing and comparing the particulars of *Artificial Instruments* in the
Table,

Table, where sometimes one Engin or Instrument may minister Aid to discover a large branch of Philosophy, as the *Baroscope*, an *Optick Glass*, &c.

And very particularly M. *Rook*'s directions for Seamen, which specifies Instruments, may hereunto belong.

And sometimes in one of the Discourses herein mention'd, and abbreviated, there are almost as many Artificial Inventions, as Experiments; as in Mr. *Boyle*'s Hydtostatical Experiments: Besides all the Chymical Operations, recited in the *Treatise* of the *Origine of Forms*, &c.

Ὅσον ἐν τῷ μεγάλῳ τὸ εὖ, αὐτὸ ἐν τῷ εὖ τὸ μέγα.

ERRATA

Page 392. lin. 23. blot out, as. ibid. lin. 24. read *of the Soul*.

FINIS.

In the *S A V O Y*,
Printed by *T. N.* for *John Martyn*, and
James Allestry, Printers to the *Royal Socie-*
ty: And are to be sold at their Shop with-
out *Temple-Bar*, and in *Duck-lane*, 1667.

8359

WOOD LIBRARY
515 Bussell Highway
PARK RIDGE, ILL. 60068

