

# PHILOSOPHICAL TRANSACTIONS.

Monday, March II. 1666.

## The Contents.

*A Preface to the Third Year of these Transactions, which is begun with this. An Account of the Enlargements of Philosophical Correspondencies; together with an Invitation to contribute Inquiries and Directions. Inquiries for several parts of the World, as Suratte, and the East-Indies in general; for Persia, the West-Indies, and there particularly, for Virginia, Bermudas, Guaiana, Brasil. Those for other Countries referred to another opportunity. Of a considerable Load-stone, digged in Devon-shire, weighing 60. pounds. Some Observables about Load-stones, and Sea-Compasses. Proposals to try the effects of the Rarifying Engin exhausted, on Plants, Seeds, Eggs of Silk-worms. An Experiment proposed of Grafting Pears upon Spina Cervina (Buck-thorn.) Observations concerning Emmets, their Eggs, Production, Progress, Comming to Maturity, and Use. Account of a Book in French, intituled HISTOIRE DES JOYAUX.*

## A P R E F A C E

*To the Third Year of these Tracts.*

**H**AVING, by Gods Assistance, finish'd my solicitations for the *Philosophical Transactions* of the two last years, I crave leave to reflect a little upon what hath past.

I think, I may safely assume, that in these *Fragments*, something hath been contributed to sowe such seeds, as may somewhat conduce to the illustration and improvement of Philosophy, and of all Laudable and Useful Arts and Practices. And

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I hope, our Ingenious Correspondents have examin'd all circumstances of their communicated Relations, with all the care and diligence necessary to be used in such Collections; not taking up old Fame, or flying Reports, upon too easie trust; nor straining for other Kinds of Wonders, than the most wise Author of Nature hath allowed, but attending closely to the strict measures of *Natural Truth*, and to the useful Contrivances of *Art*. For some evidence whereof, I refer the *Reader* to the particulars, indicated in the *Tables* annexed to the *Tract* of *February*, lately past.

And because well advised Histories of *Natural Productions*, and of *Artificial Contrivances*, are necessary to beget sound knowledge, and to *excite* profitable Inventions, some have furnisht us with accurate Instructions, under the *modest* Title of *Inquiries* and *Proposals*: And further Disquisitions are by the hands of many Accomplisht Persons severally, and often with joynt endeavours in a manner universally prosecuted.

Neither have we discouraged or refused the Essays of some famous Philosophers, learned Philologers and *Antiquaries*; whose Disquisitions, Readings, and Reasonings, have extended farther than their Experiences; since by such bold Excursions and Sallies many valuable Truths may be started out of their recesses. *Architects* do require some variety and store of Materials for the further satisfaction of their Judgment in the Choice: And the *Sculptor* must pare off somewhat of his richest Marbles, Onixes, Diamonds, &c. before he can perfect the Portraiture. Such liberty an exact Philosopher must claim in his Extracts from Men of much Learning.

In *Medicinals* we have now and then occasionally inquired after some rarities, medical applications and experiences; what the uses and performances are by *Phlebotomy*, *Frictions*, Simples or Compounds not ordinary, by Diet or Chymical Operations in some of the remotest parts of the World, particularly in the famous *China*.

See *N.* 3. p. 44. *Damps*.  
*N.* 8. p. 133. *Poysonous Springs*  
or waters.

*N.* 8. p. 133. *Swarms of In-*  
*sects.* *Ibid.* p. 138. *Strange*  
*Constitutions of Bodies.*

*Baths*, *Balns*, *Medicated Earths*, &c. And we have had a  
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due care to erect a *Pharos* for a Caution against undiscern'd dangers.

By *Anatomy* we have sometimes enter'd into the Chambers and Cabinets of *Animal* Functions , to find many Meanders and changeable Varieties , and the immediate Organs and Conduits of Life and Sensation.

As for the Growth of *Arts* and *Inventions* , I think , it may justly be said , That these our Entries sometimes assist and promote their Improvements. And the same will hereafter remain faithful Records to shew , By what steps and degrees , and by what Essays , Emulations , and Encouragements these Noble Arts advanced to perfection. And a punctual information of these Gradual Processes , may be instructive to promote other Inventions. And the Wise will consider it , at what easie rates they obtained *Monthly Advices* of the Designs and Successes of Industrious and Eminent Persons , and by the same means came to know as much , as was purchas'd at *their* great charges and assiduous labour. Of which Arts as they are now improved , and still improving , I presume I need not spare to say , That they would have oblig'd an *Alexander* , or a *Solomon* , and I must avouch with confidence , That they would have rais'd Acclamations , Applauses , and Admiration of most , and have provok'd them to refund full Rivers of Treasures in Just Rewards , and extraordinary Atchievements.

Neither is it much amiss , that there are yet some , who do prefer the darkness of old Heathenisme before this Noon-light. Otherwise , the next Age might hardly believe , that Men pretending to Wit , Prudence , and Learning , would ever make such strange Oppositions against their own great Emolument and Accommodations : And so the Vertuous might be deprived of a *fair beam* of the future Glory , due to their Memories for their unchangeable Resolutions , as unconcern'd in scoffing Discourses , and standing firm as Rocks against the dashes of foaming Disputants. And truly , they do much oblige us , in that they are pleas'd by their frets , and eager contentions , and by their fruitless and obstreperous Verbosity , to make themselves a foil , to set off the Serene Lustre of the real and obliging performances of the Experimental Philosophers.

And yet (in short to convince and reclaim as many as are hopeful) I dare, *without leave*, but with sincere affections, in behalf of the Learned *Virtuosi*, undertake to joyn issue with them, and to offer fair proof, That, whereas they pretend to *Aristotle* as their *Grand Oracle*, we have a true and higher esteem for his true worth, than these Pretenders do effectually manifest.

We say, his *Logicks* and *Rhetoricks* are very valuable. His *Ethicks* and *Politicks*, for the most part, sound. His *Metaphysicks* in many Notions acute. But all these are generally overwhelmed and degraded by the swarms of *Insectile Systemes* and dilute *Commentaries*.

And as for the other more useful Volumes of *Aristotle*, his *Tracts of Animals* (which did cost *Great Alexander* so many *Talents* for the furniture, and an ample Salary for encouragements) his *Mathematical Discourses*, and *Mechanicks*, these they never salute. They weed out his onely defects and animosities, his *Ventilations* with his Elders and *Compeers* about *Atomes* and darker Principles; a *Matter*, which is *neque quid, neque quantum, neque quale*, a *Formal* and *Substantial* *εὐτελέχεια* (a word too hard for *Cicero* to translate) and *Privation*, a *Principle* as good as the rest; his *Definitions of Causes and Affections*; his *Quaternion* of grosse *Elements* and grosser *Mixtures*, and insipid *Compositions* and *Qualities*, lesse significant than the popular Air: All of them much fitter to beget *Eternal Controversies*, than to administer any satisfaction to a reasonable Understanding. These they gather up for the sweetest *Posies* and fairest *Garlands*, wherewith to adorn their *Brows* and *Temples*; and so they take their leave of *Aristotle* at the very *Threshold*.

Thus they reject the *Harmony*, and waste all their time in *tuning the Instrument*, and are best pleased, even *ravish'd*, with those strokes which glance below the *Bridge*, by which they sharpen and turn their *Spirits* habitually, and set the teeth of their *disciples* on edge; and then

*Quo semel est imbuta recens, servabit, &c.*

We take leave to ask, Whether *Aristotle* did not illustrate his best Conceptions in his Works, with *Mathematical Demonstrations*? In this, *Blancanus* will initiate their Observations with sufficient indu'gence. We ask further, Which of the *Philosophers*

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of note, for any thing else but honest Moralities, did neglect the *Mathematicks*: What *free-born Child*, or yet what *Slave*, of any promising hopes, was not entered into these Disciplines, before they could number ten years of their Age. If these men would addict their palats to the pure fountains, and not wander after every polluted stream, then they would find more leasure for better things, to do some good for themselves and others: Then they would taste the pleasure, and reap the profit of their old Rule,

*Dulcius ex ipse fonte, &c.*

And withal they would have better understood their best friends.

Certainly; If *Aristotle* had been so happy, as to have enjoyed our *Opticks*, and other Instruments of Arts, and such *Engins* as we now employ, He would have been quite of another spirit than these are; and would have acknowledged a greater variety and more curious contexture, and more brisk *Mechanicks* in the *Insectiles*, which were in those dayes *invisible*, than in all the Animals, that were then known, or than are yet to be found in a far wider circumference; and would have confest the productions of our *Pyrotechnical Furnaces* to excell all, that could be reasonably expected from his own vast *Fiery Region*.

We say heartily, Read *Aristotle*, read him in his own Stile; read him entirely and fully; not feeding onely on his Ulcers and Excrecencies; nor taking up your rest in his *Un-intelligible Heavens*, at their *Adamantine Gates*, or about their *Flaming Walls*: Embrace his calm rayes, and his dis-interested Reasonings: chuse his best Vertues, examine and weigh all his Mathematical Illustrations, descend to his particulars: And then hasten to our *Christian* Philosophers, and they will forth-with acquaint you with the true Works and wonderful Contrivances of the Supreme Author, and with the Discoveries, which by his indulgent Providence and his benigne Inspirations have been in former and later Ages afforded, for the benefit, and the sincerely grateful acknowledgements of humane race.

'Tis our main business, as well to retrieve all *valuable Antiquities*, as to supply *fresh Discoveries*: to recover good *Old Helps*, as well as to devise *New*. All our Artificers are designed, and appropriated, to unlock all the Repositories of Nature, To draw out her most concealed Operations and Rarities, To produce them  
with

with their best Advantages, and in their fairest Ornaments, for all good occasions: And whatever we find excellent in old *Greece*, or *Rome*, or in more ancient *Monarchies*, or in any one more happy part of the World, *That* in due season to communicate all over the World, to as many, as have the Ingenuity to give them a hearty Entertainment.

After thus much of *Preface* (which the *Candid Reader* will interpret with the same affection, it was written) I return to my task. Where I think it not amiss,

*First* of all, to take notice of the late Enlargements of our *Philosophical Correspondencies* in both remote and neerer parts of the World; concerning which we are singularly obliged to several of the Generous and Intelligent Citizens of this Famous *Metropolis of England*, especially the Eminent Governours of the *East-India* and *Turky* Companies, beside those of the same City, that travelling into the *West-Indies*, have been very ready to receive, (and to promise good Accounts upon) such *Philosophical Instructions*, as were presented to them concerning many particulars, thought worthy to be further inquired into; in our *American Colonies*. To which we shall add, what we have procured, for this our purpose, by our Commerce with *Spain*, *Portugal*, and *Barbary*; as well as by our Navigations into *Greenland* and *Iceland*: And also what occasions we have before us, to enter into a confociation with *Germany*, *Bohemia*, *Hungary*, *Transilvania*, *Carinthia*, *Tyroll*, and with all the principal Cities of *Italy*: it appearing already by our former Papers, what interest we have, before now, establishd in *France*, and, by the assistance of the Eminent *Hevelius*, in all the Countries upon the *Baltick Sea*, and in *Poland*; which is therefore related here, that we may thence take occasion to invite all Ingenious Men, and such as consider the importance of Cementing Philosophical Spirits, and of assembling together Ingenuities, Observations, Experiments and Inventions, scattered up and down in the World; that they would be pleased *partly* to recommend themselves, as they have occasion, these Kinds of Inquiries to their Ingenious Acquaintance, either living upon, or travelling into such places, as are concerned; *partly* to joyn their *Symbola's*, and to send in their *Proposals*, and whatever shall occur to them worthy to desire information about, in those Countries

ries above-mention'd; and rest perswaded, that all possible endeavours shall be employed on our parts, to recommend all, what shall thus be proposed by them, to *our* Correspondents, with the same earnestness we do our own Directions, suggested by several of our Curious Friends.

## *Inquiries for Suratte,*

*and other parts of the East-Indies.*

**T**hough these *Queries* have been already dispatcht for India, and some of them even received an Answer, yet, because 'tis altogether necessary, to have confirmations of the truth of these things from several hands, before they be relyed on, it was thought fit, rather to publish the *Inquiries* alone, for a more certain and full Information, than now to joyn such Answers thereunto.

The *Inquiries* are these; as the Relations publisht by *Purchas*, *Linschoten*, and others, concerning those parts, have given occasion to propose them.

1. Whether it be true, that *Diamonds* and other *Pretious Stones*, do grow again after three or four years, in the same places where they have been digg'd out?
2. Whether the *Quarries* of Stone near *Fettipore*, not far from *Agra*, in the *Mogol's* Dominions, may be cleft like *Loggs*, and sawn like *Planks*, to ceel *Chambers* and cover *Houses* therewith? Likewise, Whether about *Sadrapatan*, on the Coast of *Coromandel*, there be a Stone of the like nature, so as, setting a *Wedge* upon it, one may cleave it with a *Mallet* as thick and as thin, as one pleaseth?
3. Whether upon the same Coast of *Coromandel*, about *Tutucorin*; and upon that of *Ceylon*, at *Manar*, and *Fafanapatan*, they fish *Pearls*, as good as those about *Ormuz*? Whether those *Pearls* are the better, the deeper they lie? What is the greatest depth, they are known to have been taken at? And whether it be true, that some of the *Natives* there, can stay under *Water* half an hour, without any *Art*?
4. Whether the *Iron* in *Pegu* and *Fapan*, be far better than ours, and if so, what is to be observed in the melting, forging, and tempering of it?

5. Whether

5. Whether in *Sumatra* there be a fountain, running a very Sanative Oyl? And whether the ignivomous Mountain in the same Island, do burn continually, and cast out stones so eaten out by the fire, that they swim?

6. What is the Opinion of the more Inquisitive Men in those parts, of *Amber-gris*? And whether the greatest quantities and masses of it are found about the Isle *Mauritius*?

7. Whether it be Winter on the East-side of the Mountain *Gates*, which comes from the North to Cape *Comorin*, whilst it is Summer on the West-side, and so, *vice versa*?

8. Whether it be true, that upon the Coast of *Coromandel*, 16 deg. Northern Latitude, between *Paleacote* and *Maselupatan*, 50. Leagues in length (the hot winds blowing from the Land-ward from 8. in the Morning, till 4. in the Afternoon, with such a suffocating heat, that the Inhabitants are not able to endure it, without extraordinary helps and refreshments;) every one daily for his provision of drink, hangs his Bottle, made of common pot-earth, and filled with Well-water, or other potable Liquor, upon some Post, Tree, or Wall, in places, where the Sun and Wind are most piercing; leaving it there all the day long in the scorching heat; and then taking it up about Evening at 4. of the Clock, the Drink is more cool, than any depth of Cellerage with us can make it. And whether, on the contrary, the Bottles being suffered to continue in the Air, as before, during the cool Sea-gales, which come in after the said hour, and continue all Night, till 8. in the Morning, to the refreshment of all Creatures, the Liquors grow hot and unfit for drink?

9. Whether the Tyde near *Mindanao*, going from the *Molucca's* to the *Philippina's*, are so swift, that neither contrary Winds nor Anchors, can save a Ship from being carried away by it; and that it rises but about 3. or 4. feet? And whether the like be observed in the Bay of *Cambaja*, and in that between *Martaban* and *Pegu*? And particularly, Whether in the said Bayes, the Tides come in with that impetuosity and swiftness about the Quarters of the Moon, that the Watch-men from high Towers must with their Trumpets give warning to the people to retire; and that a Horse in his swiftest course, when such a Tide comes upon him, cannot out-run it: as *Isaac Vossius* observes, Lib. *De Motu*

*Marium*

*Marium & Ventorum. c. 15.* And what other particulars are observable upon all those Coasts, concerning the Tydes?

10. Whether there be any Discoveries newer, than the newest printed Maps, of the parts of the World *North-east of Japan*? And whether *Japan* be truly an Island, or no?

11. What is the true way of making and colouring *China-Dishes*; and how in *China* and *Japan*, they make the *Black-vernish*?

12. With what Materials, and how they paint both upon Cloths, commonly call'd *Pintado's*, and likewise upon Canvas, &c?

13. Whether the *Lignum Aloes* be the Wood, or Root of a Tree? In what Countrey it is found? And how to know the best of the kind?

14. Whether the best *Tea* be that, which comes forth at the first of the Spring, and are the Top-leaves? In what manner 'tis dried; and whether the too hasty drying thereof hurts it?

15. Whether there grows a Wood in *Fava*, that naturally smells like humane Excrement? And if so, what kind of ground it grows in?

16. Whether in the *Molucque* Islands there be a *Red Wood*, which burns, sparkles, and flames, without being consumed; yet may be reduced to powder, by rubbing between ones fingers?

17. Whether near the Fort of *Ternate* there be a Plant, call'd by the Inhabitants *Catopa*, whence fall little Leaves, which are turned into Butter-flies?

18. Whether in *Pegu*, and other places of the *East-Indies*, they use a poyson, that kills by smelling, and yet the poisonous smell is hardly perceived?

19. Whether it be true, that the onely Antidote hitherto known, against the famous and fatal *Macassar-poyson*, is *humane Ordure*, taken inwardly? And what substance that poyson is made of?

20. Whether there be such a Vegetable in *Fava*, call'd *Mangas bravas*, that is so poisonous, that it kills presently, and for which no remedy hath been yet found?

21. Where the best *Calamba-wood*, or *Palo d' Aquila*, grows? Whether the *Palo d' Aquila* be much inferiour to *Calamba*; and

how they are distinguisht? Whether the later be the *Pith* of the former? Whence the best sort comes? Whether it be stored with a rich and cordial Balme, and that be the cause of its great rate, being much used in cases of decay of Spirits, and the lame-ness and impotency of Nerves?

22. Whether they draw an *Oyl*, resembling *Oyl* of *Camphire*, from the Roots of *Cinamon*-trees; and if so, how they draw it?

23. Whether the *Camphire* of *Borneo* be not the Exsudation or Gum of a Tree?

24. Whether the *Indians* can so prepare that stupifying Herb, call'd *Dutroa* or *Datura*, that they make it lie several Dayes, Moneths, and Years, according as they design it, in a Mans Body, without doing him any hurt, and at the end kill him, without missing an hours time?

25. Whether the *Betele* hath such a contrariety to the *Durion*, that a few leaves of that, put to a whole Shop-full of *Durions*, will make them all rot suddenly? And whether those, that have surfetted on *Durions*, and thereby over-heated themselves, do, by laying a leaf or two of *Betele* upon their Breasts or Stomachs, immediately cure the Inflammations, and recover?

26. Whether the *Papayas*, which bear fruit like a Melon, do not bear, unless Male and Female (as the Vulgar distinguishes them) stand together?

27. Whether there be two sorts of the Tree, call'd *Arbor Triste*, one, by the Name of *Triste di Die*, the other, *Triste di Notte*; whereof the former sheds his flowers at the Rising, the other, at the Setting of the Sun? And whether the distilled water thereof (call'd *Aqua di Mogli* by the Portugals) may not be transported into these parts?

28. Whether one of those Trees, call'd *Arbre de Rays*, propagates it self into a whole Forrest, by shooting up, and letting fall Roots from all its branches into the ground, that spring up again, and so on? And whether there be any single ones of these Trees, that are above 50. feet in Diameter, as some affirm?

29. What particulars are observable in any other Plants of those parts?

30. Whether those *Shell-fishes*, that are in *these parts* plump and in season at the *Full Moon*, and lean and out of season at the *New*, are found to have contrary Constitutions in the *East-Indies*?

31. Whether the Animal, that yields the true *Muske*, be like a *Dear*, hornless, found in the High-Country between *Pegu* and *China*? And whether the *Muske* grows in Baggs, Blisters, or Swellings, which the Beast rubs off against Trees; it being affirmed to have been found in the Woods by the Scent? Whether true *Muske*, is discerned from false by its yellowness, when rubb'd upon ones hand, and by its keeping that Colour and the Scent?

32. Whether there be two sorts of *Gum-lack*, one produced by an Insect, a certain winged Ant; the other, the Exsudation of a Tree?

33. To inquire after the Fish call'd *Caballa*, said to be very powerful in stanching of blood?

34. Whether about *Fava* there be Oysters, or other Shell-fishes, of that vast bigness, as to weigh 300. pounds?

35. Whether in *Malacca* there grows sometimes a stone in the stomach of a kind of *Porcupine*, call'd *Pedro Porco*, esteemed for its Cordial Vertue above *Bezoar*?

36. Whether there be found in the head of a certain Snake, a Stone, which laid upon a wound of any Venemous Creature, sticks fast to it, and draws away all the poyson; then being put in Milk, voids its poison, and turns the Milk blew; and then applied again, draws out the rest of the poison, that may be behind, till the wound be perfectly cleansed?

37. Whether the *Rhinoceros* have such an Antipathy against Elephants, as is commonly related?

38. Whether in the Island of *St. Helena*, the Tide be at the same time round in the several Coasts of it; and what is the hour of Full Sea, and what the age of the Moon at the time of Observation?

## Inquiries for Persia.

1. **W**Hat are chiefly the present Studies of the *Persians*; and what Kind of Learning they now excell in?
2. What other Trades or Practices, besides *Silk*-and *Tapistry*-making, they are skilled in?
3. VVhether, there being already good Descriptions in *Words* of the Excellent Pictures and Basse Relieves, that are about *Persepolis* at *Chimilnar*, yet none very particular; some may not be found sufficiently skill'd, in those parts, that might be engaged to make a Draught of the Place, and the Stories there pictured and carved?
4. How they make that Plaister, wherewith in those parts and in *India* they line their *Tanks* or *Cisterns*, and which, when dry, shines like *Marble*, and is much harder?

Other *Queries*, concerning the Air, VVaters, Minerals, Vegetables, Animals, &c. peculiar to *Persia*, may be taken out of those *General Heads* of Inquiries, for a *Natural History* of a *Country*, printed in *Numb. 11.* and out of those *Articles* of Inquiries concerning *Mines*, publisht in *Numb. 19.* to which we refer the *Reader*.

*As to the Inquiries proper for Turkey, they also are already publick. See Numb. 20.*

## Inquiries For Virginia and the Bermudas.

1. **C**oncerning the Varieties of *Earths*, 'tis said, there is one kind of a *Gummy* consistence, white and cleer: Another, white, and so light, that it swims upon-water: Another, red, call'd *Wapergh*, like *Terra Sigillata*. Quære, what other considerable kinds are there? And to send over a parcel of each.
2. VVhat considerable Minerals, Stones, Bitumens, Tinctures, Drugs?
3. VVhat hot Baths, and of what Medicinal use?
4. VVhat is the Original of those large Navigable Rivers, which

which empty themselves into the Bay of *Chesapeak*? And whether on the other side of that ridge of Mountains, from which they are supposed to proceed, there be not other Rivers, that flow into the *South-Sea*?

5. How the Silk-graffe is prepared?

6. To give a full account of that Vulnerary Root, called *Wichacan*: Of *Pocone*, a Root of a red juyce, a good tincture: Of *Musquaspenn*, a Root of a red tincture: Of the Plant *Maricock*, whose fruit is said to be fashion'd like a *Lemmon*, exceeding pleasant to the taste; of a blossom most beautiful: Of the *Chincowen*-Tree, whose fruit is said to have a huske like a *Chesnut*, luscious and hearty meat, both raw and boiled.

7. Whether there be in the *Bermudas* a Poison-weed, like our *Ivy*, whose leaves do by the touch cause Blisters? And a Reed, whose juyce or infusion causeth Vomit?

8. What kind of Trees those Barkes are taken from, that are used instead of Tile or Slate in the covering of their Houses, being cooler in Summer and warmer in Winter, than Stone?

9. To give a particular account of the Spider in the *Bermudas*, said to be large and beautiful for its colours; weaving a Web betwixt several Trees, which is affirmed to be for substance and colour like perfect raw Silk; so strong, that Birds, like Snites, are snared therein?

10. Whether Deer have there generally three or four Fawnes at a brood? And whether any of the Cattle transported from hence, becomes there more fruitful, than they were here?

11. Whether the Relation be true, of a *Glue* made of Harts-Horn, that will not dissolve in Water; and if so, how made?

12. Whether at the bottom of the Bay of *Chesapeak* Northward, the Natives be still of such a *Gigantick* Stature, as has been reported? And, whether there be another people, not far from these, Eastwardly, of a *Dwarfish* Stature?

13. Whether round about the Coast of the *Bermudas*, the *Tydes* keep the same time; and at what a clock precisely 'tis *High-water* on the Dayes of *Full* and *New Moon*; and how high the Water rises then? And the like on the Coasts of *Virginia* and *Florida*?

For

## For Guaiana and Brasil.

1. **V**V Hether about *Urraba* near *Oronoque*, some 8. degrees Northern Latitude, and about the Town *Darien*, Toads are presently produced, by throwing a kind of Moorish Water found there, upon the Floors of their Houses? *Linschoten*.

2. Whether it be true, that the Locust of *Brasil*, call'd *Caayara*, changeth in the Spring-time of that Countrey into a Plant, and withers away, like a Plant? And whether in the same Countrey, that kind of *Eruca*, call'd by the Portugals *Lagartas des Verias*, turns into a Bird, admirable for Colour and swift flying; the change thereof being made so leasurely, that one may for a while see half of the Insect, and the other half of the Bird, which the Natives call *Guainumbi*, the Portugals *Pegafrel*. *Piso*.

3. Whether upon the Leaves of that *Brasilian* Tree, call'd *Cereiba*, there is, in a Sun-shiny day, found a *White Salt* in that quantity, that one may gather as much from two or three Leaves, as will well salt a good pot of Broth? *Piso*.

4. Whether there be found about the mouth of the River of *Amazons*, a *green Argilla*, which, though very soft under water, yet, when exposed to the Air, grows almost as hard as a Diamond; in so much that the Natives make *Hatchets* of them, strong and sharp enough to cleave Wood; for which purpose also those *Indians* are said to have used it, before they got Iron-ones? And, whether this *Argilla*, become Stone, have a peculiar vertue against the *Epilepsys*, when carried by the Patient? *Pelleprat* in his Relation of the *Islands* and *Terra-firma* of the *Southern America*.

5. Whether the *Black Bees* in *Guaiana*, about the River *Oronoque*, make black Honey and Wax? And whether they have no Stings, as the same *Pelleprat* affirmeth?

*The other Inquiries, ready for the other Countries above-named, are, to avoid tediousness, referred to another opportunity.*

*Of a considerable Load-stone digged out of the Ground  
in Devonshire.*

**T**His Stone was lately sent up out of the said County, and presented to the *R. Society* by the Reverend Arch-deacon, Doctor *Edw. Cotton*, with this description, That it weighs 60 pounds; and that, though it take up no great weight, yet it moves a Needle about nine Foot distant. Some part of it being broken off, he hath sent up also, because (*saieth he*) being put in its proper place, it adds much strength to it, but without that addition it moves not much more than seven Foot.

*Care will be had, that Tryals be made of the Vertue of this Stone, both of the two pieces closed together, and of each piece separately, and that uncapped as well as capped.*

*Some Observables about Load-stones, and Sea-Compasses.*

A Noble Person did upon a late occasion, affirm, That a Needle of a Sea-Compass, put in a good Iron Mine (which, *he said*, yielded 23 pounds of Metal, out of a 120 pounds of Ore) was not sensibly moved thereby.

Another Honourable Person desired, it might be observed, whether touched Needles move otherwise, when the Veins of Iron do not lie *North* and *South*, then when they do so?

It being inquired by a *Note* from forreign parts, Whether the Sea-Compasses in *England* were brought to a greater perfection, than in other *Countries*? Answer was made by intelligent persons here, That all the perfection of our Sea-Compasses, as yet, consisted in this, That the Needles be touched by good Load-stones, and well librated, and that the Variation be truly placed: Though it was suggested withal, that for the greater perfection of such Sea-Compasses, a way was contriving, to shew the Variation to *Minutes* and *Seconds*.

It was also propos'd, That it might be inquired into,

1. Whether a *Needle* may be so toucht upon any Magnet, as not to point to the true *North* and *South*, to be tried in such places where there is no Variation known?

2. Whether

2. Whether different Load-stones will give different Directions? And whether fainter or stronger touches upon one and the same Magnet, will cause any Variation in the Directions? For which purpose, as many Load-stones should be procured, as could be had, and a good number of Needles exactly made, of the same Metal, bigness, and figure?

### PROPOSALS

*To try the Effects of the Pneumatick Engine exhausted, in Plants, Seeds, Eggs of Silkworms.*

The Ingenious Dr. Beale did formerly suggest, as follows.

It would be, I think (*saieth he*) very well worth the tryal, to see what Effects would be produced on Plants, put into the Pneumatick (or Rarifying) Engine of Mr. Boyle, with the Earth about their Roots, and flourishing; whether they would not suddenly wither, if the Air were totally taken from them. And particularly to try in the Season, *Cherry-Blossoms*, when partly opened, partly not opened, upon a Branch; to wit, whether the Air may be so attenuated as to blast. But it may be noted, that the Blossoms do not forthwith discover the blast: An old experienced Country-man having once given me notice of a blasty Noon, (it being then a Sultry weather, and somewhat gloomy with the thickness of Exhalations, almost like a very thick Mist) and within a day or two shewing the proof upon the *Cherry-Blossoms* then flagging, but not much altering their Colour till two days more were past.

*The Noble Mr. Boyle suggests as proper for the approaching Season; That it may be tried,*

1. Whether Seeds (especially such as are of a hasty growth, *vid. Orpin, Lettice, Garden-cress-seeds, &c.*) will germinate and thrive in the exhausted Receiver of the said Engine?

2. Whether the Exclusion of Air from the *Sensitive Plant*, would be harmful to it?

3. Whether the Grafting of Pears upon *Spina Cervina* (the almost only *Purgative Vegetable* known in *England*) will produce the effect of communicating to the Fruit that purging quality, or not?

4. Whether *Silkworms Eggs* will be hatched in such an exhausted Receiver, in the Season proper for hatching?

To

To which may be added, the Trials of putting in a Vial full of water, some of those Herbs that will shoot and grow in water alone, including them in such a Receiver, and pumping out what Air you can, to see whether they will then shoot, or not?

And though some of these *Proposals* have been formerly begun to be Experimented, yet ought they to be diligently prosecuted, to see how far the Air is necessary to Vegetation; and whether Plants do indeed live as much upon the Air, as the Earth; and the Branches of them are rooted (as it were) *in* and quickned by the Air, as their Roots are planted and nourisht in and by the Earth?

The Experiment heretofore made of this kinde, was, That some Lettice-seed being sown upon some Earth in the open Air; and some of the same Seed at the same time upon other Earth in a Glass-Receiver of the above mention'd Engine, afterwards exhausted of Air; the Seed exposed to the Air was grown up an inch and a half high, within eight days; but that in the exhausted Receiver, not at all. And, Air being again admitted into the said emptied Receiver, to see whether any of the Seed would then come up; it was found, that in the space of one week it was grown up to the height of two or three Inches.

### OBSERVATIONS

Concerning *Emmets* or *Ants*, their Eggs, Production, Progress, coming to Maturity, Use, &c.

*This was communicated by Doctor Edmund King, Fellow of the R. Society, at the Instance of the Publisher, as followeth.*

1. **T**Here have occur'd to my Observation but three sorts of *Ants*, commonly without Wings; *vid.* Very Black, Dark Brown, and the third sort of near the colour usually call'd *Philemorts*.

2. Each kind inhabit by themselves in their several Banks; two sorts seldom or never being found together; and if either of the other two sorts be put into the black *Ants* Bank, 'tis worth observing, what enmity there is betwixt these little Creatures, and with what violence the *Black* ones will seize on the *Red*, never leaving to pinch them on the head with their *Forceps* or Claws, till they have kill'd them upon the place: which done, they will car-

ry them dead out of the Field, from their Bank. But if you put *Black Ants* into a Bank of the *Red*, the *Black* seem to be so sensible of the strangeness of the place they are in, that there they will not meddle with the *Red*, but as if they were frighted, and concerned for nothing but self-preservation, run away.

3. Upon opening of these Banks, I observe first a *white substance*, which to the bare eye looks like the scatterings of fine white Sugar or Salt, but very soft and tender; and if you take a bit of it, as big perhaps as a Mustard-seed, and lay it on the Object-plate of a good *Microscope*, you may by opening it with the point of a Needle, discern many pure, white and clear appearances in distinct Membrans, all figur'd like the lesser sort of Birds Eggs, and as clear as a Fishes Bladder. This same substance as it hath been just now described, I finde in the *Ants* themselves, which I take to be the true *Ants Eggs*; it being obvious to observation, that where ever this is uncover'd, they make it their business to carry it away in their mouths to secure it, and will after you have scatter'd it, lay it on a heap again with what speed they can.

4. I observe they lie in multitudes upon this (if I may so call it) Spawn of theirs; and after a little time, every one of these small adherances is turn'd into a little Vermicle, as small as a Mite, hardly discerned to stir; but after a few days more, you may perceive a feeble motion of flexion and extension, and they begin to look yellowish and hairy, shaped very like a small Maggot; and so, keeping that shape, grow almost as big as an Ant, and have every one a black spot on them.

5. Then they get a *Film* over them, whitish, and of an Oval shape, for which reason I suppose they are commonly call'd *Ants Eggs*, which yet (to speak properly) they are not.

6. I have, to prevent mistakes, opened many of these vulgarly call'd *Ants Eggs*, I mean, the lesser sort, (for there are some as big as a Wheat-corn, others less then a Rye-corn) and in *some* I finde onely a Maggot, to appearance just such as was described before: In *others*, I finde a Maggot beginning to put on the shape of an Ant about the head, with two little yellowy specks where the Eyes are design'd: In *others*, a further progress, and furnisht with every thing to compleat the shape of an Ant, but wholly transparent, the Eyes onely excepted, which are then as black as black Bugles.

7. But

7. But when they have newly put on this shape, I could never discern the least motion in any one part of the little Creature, whereof the reason may perhaps be, the weakness of their Fibres; for after a little more time, when they begin to be brownish, they have strength to stir all their parts.

8. At last I met with some of these reputed Eggs, which being carefully open'd by me, I took out of several of them, every way perfect and compleat Ants, which did immediately creep about among the rest, no way differing from many other Ants, but by a more feeble motion of their Limbs. And this I took for a clear demonstration of what I designed, which was to know, That the Film does onely cover the Maggot, while she is transforming into an Ant, and fit to shift for her self.

9. The *black speck* that is at one end of every such reputed Ants Egg, I suppose to be cast out of the Maggot in her transformation; since, after it puts on the shape of an Ant, the Speck is quite gone, and the whole body of the Ant pure clear; since also this Speck at the end of the said Egg, lies always close to the *Annus* of the included Ant.

10. As to their care for their *Young* (by which I mean all the sorts and degrees aforesaid, from the Spawn to the vulgarly call'd Eggs, in every one of which you'll finde a young Ant) it is observable, How upon the breaking up of their Banks, they make it their business immediately to carry their Young out of sight again, laying the several sorts of them in several places and heaps: the which if you mingle again or scatter, you shall, laying but some bits of Slate, or the like, in any place they may come to and get under, after a few hours see all the Vermicles, and vulgarly call'd Eggs, laid in their several and distinct parcels, under such pieces of Slate, &c. Provided the place be not so cold as to chill their Limbs; which if it be, by being brought to the fire they will soon recover their strength, and fall to their business again, of securing their little Ones.

11. I have observed in Summer, That in the Morning they bring up those of their Young (that are vulgarly call'd Ants Eggs) towards the top of the Bank; so that you may from Ten in the Morning, until Five or Six Afternoon, finde them near the top, especially about One, Two, or Three of the Clock, and later, if the Weather

be hot, when for the most part they are found on the South-side of the Bank: that towards Seven or Eight at Night, if it be cool, or likely to rain, you may dig a foot deep before you can finde them.

They know all the sorts of their Young so well, that you cannot deceive them, though you may with fine Sugar, Salt, or the Crums of very white stale Bread, scatter'd in the Mould, where their first true Eggs are ( as I call them ) be mistaken your self, yet the Ants will not, nor touch a bit of what is not their own Off-spring.

13. I cannot pass by the Use of *Ants* in feeding young Pheasants and Partridges, they being the principal Food of these Birds, both wilde and tamed, for several weeks, as is well known to all that are versed in breeding them up. And a chief reason, why many finde it so nice a thing to breed up the said Birds, is, that either they give them too sparingly of this Food, or let them fast too long, not knowing, that as soon 'tis day-light, they will seek it for their Breakfast, and if they want it, will in a few hours be faint and weak, and some grow so chill for want of that supply of Nourishment, that it is no easie matter to recover them.

14. But ( to add this by the by ) Though these Insects be so good a Food to these Birds, whilest very young; yet when by ill ordering of those that should keep them sweet, and often shift their water, or by ill Dyet, as musty Corn, &c. they grow sick; then Ants will not always recover them, though you give them never so many: And I have been forced to make use of other Insects to cure them, to wit of *Millepedes* and *Earwigs*, either of which will do good, but both together, better; given in a good quantity, two or three times, at least, a day; but then those other things must be observed too, of keeping their House clean, and giving them sweet Corn, and shifting their water twice a day, keeping them within, till the Dew be from the ground, letting them bask in Sand, partly in the Sun, the place a little shaded, and putting them up in a warm house before Sun-set.

Which particular I thought not amiss to add for those that delight in breeding up *Pheasants* and *Partridges*, my self having lost many of both sorts, till I learned that Vertue of those Insects; after which, seldom any of them, by me intended to be bred up, have died.

*An Account*  
*Of a small Book in French, entituled*  
 HISTOIRE DES JOYAUX.

E T  
*Des Principales Richesses de l' Orient et de l' Occident,*  
*par le Sr. Chapuzeau.*

**T**His History treats of Diamonds, Rubies, Emeralds, Pearls, Coral, Bezoar, Yellow Amber, Amber-gris, Indigo, &c.

Of *Diamonds*, The Author shews :

1. The *Places*, whence they are taken; of which he finds but Five in all the *East-Indies*, whereof *two* are *Rivers*, vid. *Saccadan* in *Borneo*, and *Nage* in the Kingdom of *Bengala*; at the bottom of both which, he saith, the *Diamonds* are found among the sand, after the waters, that fall as great *Torrents* from the *Mountains*, are run off; and the three others are *Mines*, in the Kingdoms of *Decan*, *Cuncan*, and *Golconda*. In this Relation he observes, that the *Diamonds* which are found at the bottom of those *Rivers*, have the best *Water*; but those, in *Mines*, have often *Flaws* (which he imputes to the violent knockings of the *Rock*) and *Blebs*, ascribed to the condition of the *Earth* or *Sand* they are found in, vid. when that is not pure, but fattish or black. He takes also notice, that *Diamonds* are the heaviest of precious *Stones*, as *Gold* is of *Metals*.

2. The *Manner*, how they are found and separated; which is the same in substance, with that, described *Num 18. p. 328.*

3. The *Price* of them, according to the proportion of their weight; for which he gives this Rule. Take, saith he, a *Diamond* of 10 *Carats*: this number is to be squared (which makes 100.) then, if the *Stone* be clean, each *Carat* according to its perfection, may be worth 40 to 60 *Crowns*; if it have no good water, or have a *Bleb* or *Flaw*, the *Carat* will not be worth but from 10 to 30 *Crowns*. So multiplying the said 100 by the number, which each *Carat* of such or such a *Stone* may be worth, the product is the price of the *Stone*.

For

For *Rubies*, he discourſes alſo of the *Places*, where they are found; and of their *Price*. The *Places*, are, the Kingdom of *Pegu*, and the Iſle of *Ceylon*; whence very few are ſuffered to be carried away. The *Price* is, that a good *Rubi* of the weight of 1 *Rati* (which is  $\frac{7}{8}$  of a *Carat*) is eſteemed at 20 old *Pagodes* in *India*, each *Pagode* being about 10 ſhillings *Engliſh*.

<i>Ratis.</i>	<i>Pagodes.</i>
Of 2	is valued at 100.
Of 3	———— 250.
Of 4	———— 500.
Of 5	———— 900.
Of 6	———— 1500.
Of 7	———— 2300.
Of 12	———— 12000.

Concerning *Turquois*, they are found in *Persia*, in the Province of *Chamaquay*, North of *Iſpahan*, in two Mines, called the *Old* and the *New* Rock. Theſe of the *New*, are of an ill whitish Blew; but thoſe of the *Old*, are not ſuffered to be digged out, but by the King of *Persia* himſelf.

*Emeraulds* are affirm'd by him, never to be found in the *East-Indies*, but in *Perou*, whence they were carried by that Trading People to the *Moluccas*, even before *America* was diſcovered by the *Europeans*; and ſo they come from the *Orient*; of much leſs value, than they were formerly, by reaſon of their commonneſs. The Author notes, that *Emeraulds* grow in ſtones, juſt as *Chryſtals*, forming a *Vein*, in which they are by little and little refined and thickned: and that ſome of them are ſeen, half white and half green; others, all white; and others all green and perfect.

To *Pearls* he aſſigns in the *Orient*, four places, where they are fiſhed: The Iſle of *Baharem* in the *Persian Gulf*: The Coaſt of *Arabia Felix*, near the Town of *Catif*, over againſt *Baharem*: The Iſle of *Ceylon* about *Manar*: The Iſle of *Japan*. The beſt at *Ceylon*, but ſmall; the biggeſt at *Japan*, but uneven. In the *West-Indies* they are fiſh'd in the *North-Sea*, in the Iſles of *Marguerite*, *Cubagva*, *St. Marthe*; and at *Comana*, and *Comanagote*, near the Continent; and in the *South-Sea*, near *Panama*: which

*American*

*American* sort, though they are much inferiour to the *Oriental*, in Lustre, yet they far excel them in bigness, amounting sometimes (saith this *Author*) to 42 *Carats*.

In this Relation 'tis mention'd, that sometimes 5. or 6. *Pearls* are found in one *Oyster*: That *Pearl-fishers* are fed with dry and roasted meat, to give them better breathing: That *Pearl-bearing Oysters* are not good to eat, being flat and hard of digestion, &c.

As to the *Price* of good *Pearls*, well fashion'd, he marketh it, as follows:

## Such a Pearl of

Grain.	Crowns.	Carats.	Crowns.
1	1	$4\frac{1}{4}$	289
2	4	$4\frac{1}{2}$	324
3	9	$4\frac{3}{4}$	361
Carats.		5	400
1	16	$5\frac{1}{4}$	441
$1\frac{1}{4}$	25	$5\frac{1}{2}$	484
$1\frac{1}{2}$	36	$5\frac{3}{4}$	529
$1\frac{3}{4}$	49	6	576
2	64	$6\frac{1}{4}$	625
$2\frac{1}{4}$	81	$6\frac{1}{2}$	675
$2\frac{1}{2}$	100	$6\frac{3}{4}$	729
$2\frac{3}{4}$	121	7	784
3	144	$7\frac{1}{4}$	841
$3\frac{1}{4}$	160	$7\frac{1}{2}$	900
$3\frac{1}{2}$	196	$7\frac{3}{4}$	960
$3\frac{3}{4}$	225	8	1024
4	256		

Of *Corals*, He taketh notice, where they are fish'd, and in what manner. The Places, he saith, to be Eight; Three upon the Coasts

Coasts of *Corfica* and *Sardinia*, *vid.* at *Argueil* (where is the best) *Baza*, and near the *Isle of St. Peter*: One upon the Coast of *Sicily*, near *Drepanum*: Two upon the Coast of *Africa*, near the *Bastion of France*, and at *Tabarca*: One more, upon the Coast of *Catalonia*, at the *Cape of Quiers*: And the last, about *Majorca*. Observing, that red Coral is not found, but in the *Mediterranean* alone, where 'tis fished from the beginning of *April*, till the end of *July*, employing commonly about 200 Boats. The manner of fishing them, is with two big beams of wood, laid cross wise, with a good piece of Lead on the middle, to make it sink, casting about it course Hemp, carelessly twisted, and tying this Wood to two Ropes, whereof one hangs at the Sterne, the other at the fore-part of the Boat, and so letting this contrivance fall into the Current, along the Rocks, where the Hemp being turned about, and engaged in the Coral, there need sometimes many Boats to draw away the Instrument.

*Bezoar* he saith, is not onely found in *Golconda*, in the Province of *Renquery*, in the Maw of Goats, whereof some are at times furnisht with a dozen a piece; but also at *Macassar*, in the *Isle of Celebes*, in the Body of Apes; bigger than those found in *Golconda*. He mentions, that the people in those parts, to find whether a Goat hath any of those *Bezoar-stones* in its body, do beat his belly with their hands, and rub it, till all the stones in the Animal come together, and then they feel and tell them, as you do stones in a Bag, &c.

F I N I S.

In the SAVOY,

Printed by T. N. for *John Martyn* at the Bell, a little without *Temple-Bar*, and *James Allestry* in *Duck-Lane*, Printers  
to the *Royal Society*, 1667.