

PHILOSOPHICAL TRANSACTIONS.

July 18. 1676.

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An Extract of a Letter written from Dublin to the Publisher, containing divers Particulars of a Philosophical nature. viz. a Narrative of a strange effect of Thunder upon a Magnetick Sea-card; some Remarks concerning the gradual Alteration of the Temperature of the Air in divers Countreys; a contrivance of an uncommon Hygroscope; The Musky scent of certain parts of the Animal called Musk-quash, &c. Mr. Leewenhoecks Letter to the Publisher, about the Texture of Trees, and some remarkable discovery in Wine. Mons. Hevelius observation of a Solar Eclipse of A. 1675. Mr. Flamsteeds, Mr. Townlyes, Mr. Haltons, Signor Cassini's and Monsieur Hevelius's, Observations of the Late Eclipse of the Sun. An extract of a letter of Dr. Matthias Mangold of Basel, concerning a Mathematico-Historical Table, designed in that University; together with a Description of the same. An Account of four Books: I. Experiments, Notes &c. about the MECHANICAL Origin of divers particular QUALITIES; among which is inserted a Discourse of the imperfection of the CHYMISTS Doctrine of Qualities; together with some Reflexions upon the Hypothesis of ALGALI and ACIDUM: By the Honorable Rob. Boyle Esq; II. TH. Bartholinus de PEREGRINATIONE Medica &c. III. Georg Hier. Velschij Centuria duæ Observationum Physico-Medicarum. IV. Joh. Nicolaus Pechlinius M. D. de AERIS et ALIMENTI DEFECTU, et VITA SUB AQUA.

An extract of a Letter &c. from Dublin May the 10th. 1676.
SIR,

Finding amongst my *Adversaria* some observations, that I thought might not be unacceptable to you, nor impertinent to your design of making collections for the History of Nature; I have here sent you a few, of such as my other occasions would at present afford me leisure to recollect. This ensuing Narrative, concerning the strange effect of Thunder upon a Magnetick Sea-card, I had from one Mr. *Haward* that was Master of several ships, and a man of good credit.

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He tells me, that being once master of a ship in a voyage to *Barbados*, in company of another, commanded by one *Grofton* of *New-England*, they were, in the Latitude (as I remember) of *Bermuda*, suddenly alarmed with a terrible clap of Thunder, which broke this *Groftons* fore-mast, tore his sayles, and did some damage to his rigging: But by that time the noyse, together with the danger of this frightful accident, was past, Mr. *Haward*, to whome this Thunder had been more favorable, was however no less surpris'd, to see his companions ship steer directly homeward again: At first he thought, that perhaps the confusion that the late mischance had put them in, might have made them mistake their course, and that they would soon perceive their error; but seeing them persist in it, and being by this time almost out of call, he tack't and stood after them; and as soon as he got near enough to be well understood, asked where they were going: but by their answer (which import'd, that they had no other design, than the prosecution of their former intended voyage) and by the sequel of their discourse, it at last appeared, that Mr. *Grofton* did indeed steer by the right point of his compass, but that the card was turned round, the North and South points having changed positions; and though, with his finger he brought the flower-de-Lys to point directly North, it would immediatly, as soon as at liberty, return to this new unusual posture; and upon examination he found every compass in the ship of the same humor: which strange and sudden accident he could impute to nothing else but the operation of the Lightning or Thunder newly mentioned. He adds, that he lent *Grofton* one of his compasses to finish the voyage; and withall that those Thunder-strucken ones did never to his knowledg recover their right positions again; and that he believes, if Mr. *Grofton* be living, he hath one of them to this day.

That in *America* (at least as far as the English plantations are extended) there is an extraordinary alteration, as to temperature, since the *Europeans* began to Plant there first, is the Ioynt assertion of them all; neither hath it near so many admirers, as witnesses: in regard that this change of temperature, is, and not without some reason, generally attributed to the cutting down of vast woods, together with the clearing and cultivating of the Country; but that *Ireland* should also considerably alter without any such manifest cause, doth certainly, either invalidate the reason generally admitted for the alteration of *America* newly mentioned, or else evince, that quite different causes may produce the same effect

For if it be true, as some compute, that this Kingdom was better inhabited and husbanded before the late bloody war, than at present, it should, according to the reasons alledged for the change of temperature in America, be rather grown more intemperate, *viz:* for want of cultivation: But the contrary is observable here, and every one almost begins to take notice, that this country becomes every year more and more temperate. Now whether there were more inhabitants in *Ireland* before the late war than at present, I shall not here insist upon, neither do I think it an easy matter to determine, yet sure I am, that there hath been no such increase of people here within these 16 or 20 years, nor such improvements as to be accountable for the great change of temperature that is of late observed. Within less than the time newly mentioned, 'twas not unusual to have frost and deep snowes of a fortnight or three weeks continuance; and that twice or thrice, sometimes oftner in a winter; nay we have had great rivers and lakes frozen all over, whereas of late, especially these two or three years last past, we have had scarce any frost or snow at all. Neither can I impute this extraordinary alteration to any fortuitous concurrence of ordinary circumstances requisite to the production of fair weather; because it is manifest, that it hath proceeded gradually, every year becoming more temperate than the year preceding. If any in this city or country hath kept an exact account of the weather for at least a dozen or fourteen years past, I doubt not but their Journals will verify, what I have only in general observed, and thus far insisted upon. For my own part, I was never furnished with leisure nor conveniences before this year, to make any observations in particular of this kind; my occasions being such as required a removal from place to place, and for some time to the *West-Indies*. As for the last year, I can only tell you in generall, that all the winter was very mild, and warmer than could be well expected from such a season, and but very little rain. having in the whole month of *February* not rained above twice or thrice (at least in that part of the country where I was then,) insomuch that many took upon them to predict, that such unseasonable weather would certainly be the cause of some dearth or pestilence (for all extraordinary appearances of weather, Meteors, &c. according to the Vulgar, must needs be presagers of Mischief) the ensuing Summer or Autumn; but their Predictions proved as false as the following Harvest was extraordinary both for health and plenty.

This last winter now newly ended, I have Kept an exact account of wind and weather (as I intend to doe, God willing,

for the future) being well provided with a *Barometer*, *sealed Thermometers*, *Hygrosopes*, and all things requisite to the performance of so nice and necessary a Task. To transcribe my Journall here would be too tedious, and needless, untill I have made farther observations. Let it suffice therefore to tell you; *that* it hath been a very fair and warm, or rather no winter at all; *that* we have not had above five or six frosty mornings this winter, and none that lasted longer than till noon; that we had Snow but thrice; the first before Christmas, the second upon the 11th. and third upon the 17th. of *January*: This last, which was the longest Snow we had this winter, continued not 48 hours, but thawed. All this winter, we never had two daies of rain together, nor above two or three that could well be called rainy daies. *March* 14th. we had a shower of rain and hail together; the wind being S. W. and calm. The Mercury in my Barometer (which is very slender, but carefully filled, and conveniently placed) is for the most part about $29\frac{4}{10}$ inches high above the surface of the stagnant Quicksilver; but yet doth very sensibly and frequently vary its height according to the difference of the Atmospheres gravity: *January* 17th. (which was the day it last snowed here) the φ was subsided to $28\frac{2}{10}$ inches. The next day it was at $28\frac{2}{10}$ being towards night somewhat blustering, and the snow thawed. *Jan.* 19th. being fair but very foggy, the φ was at $28\frac{1}{2}$, which is the lowest station it was ever at yet with me; the wind was westerly and calm. The next day it was up again to 29 and afterwards higher. *Feb.* 15th. in the morning being cloudy, the wind Westerly and blustering, the φ was at $29\frac{8}{10}$; and about 11 that night, being fair, clear and calm, it was risen to $30\frac{2}{10}$ inches. The next day being still fair and calm, it was at $30\frac{3}{10}$ inches; which is the utmost height I have yet seen it at. Next day it fell a little beneath 30, and kept, as before, for the most part about $29\frac{3}{10}$ or $\frac{4}{10}$, to this present; only on the 11th. of *March* it was at 30 again. Though it be observed, that frosty and snowy winters make early springs, and for as little as we have had of either this winter, yet there hath not within the Memory of any now living happened a forwarder Spring in *Ireland*; since this place could produce some store of ripe Cherries in the midst of *April*. The wind keeps for the most part here between the North-west and the South, seldom at East, and yet seldomer at North or North-east, insomuch that many here don't scruple to affirm, that for at least $\frac{3}{4}$ of the year the wind is Westerly; and we have sometimes known passengers wait at *Chester* & *Holy head* no less than three months for a fair wind, to come hither.

The *Hygroscope* I make use of, I thus contrived. I took two
pieces

pieces of Deal board (Poplar would have been better) each about two foot long, and a foot or more in breadth, (A. B). These I got well plained, and shotten, that their edges might meet even together. Of these two, set edge by edge, I fastened each end between two ledges of Oak (C. C.) of two inches broad and long enough to reach athwart both boards, (but one ledge, if it be thick enough, might be made to serve each end, by making hollow furrows or gutters in it to receive the ends of the boards) and so I fixed both boards in, as pannels are set in Wainscot. This done, supposing $\frac{1}{4}$ of an inch to be the utmost distance that these two boards would shrink asunder in driest weather (for it mattered not much, though it should be somewhat more or less) I took a thin piece of Brass (D.) of two or three inches long and $\frac{1}{4}$ inch broad, and upon one edge towards the end I measur'd $\frac{1}{4}$ of an inch: (which was the utmost distance I supposed the two boards would gape asunder;) which space (*d. d.*) I divided into five equal parts, and with a small file made them into so many fine teeth, like those of a watch-wheel. This piece of Brass I plac'd flat, across the juncture of the two boards, nailing its one end, by means of two small holes (*b. b.*) to the board A. only, and leaving the other end, which is the toothed one, free, and reaching to a competent distance over the board (B.) to which it had no coherence. Next I made a pinion, (consisting of as many teeth as the Brass had) (*e*) upon the end of a piece of thick Iron wire: This Axel (*F*) with its pinion (*e*) I so fastned to the other board (B) by means of the Brachiolum (*E.*) and so adapted to the teeth of the Brass plate, that when the boards do shrink asunder, the Brass being drawn a little away, must needs turn this Axel (by means of its toothed pinion) more or less; and so if ever it happens, that the boards gape but a quarter of an inch asunder, this Axel will have made one intire revolution: Wherefore I put a long index (*G. G.*) upon the extremity of this Axel, and made a circle round it with the usual graduations, numbered from what point I pleas'd, and the motion of the index back or forward, shews me the degrees of the drought or moisture of the Ayr. Now this Axel may be made to come through a round plate of wood or Mettle that hides the contrivance all but the hand and figures, as in a clock or Watch. Tis to be noted more over, that the boards must be fastned to the ledges, only at the outer edges, as at *a. a. a. a.* that they may have the more liberty of swelling and shrinking asunder. The commodiousness of this kind of *Hygroscope* in comparison of those made of wild Oat-boards may best be observed

Tab. 1.
Fig. 1.

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ved by those that are furnished with both; and therefore I shall only add, that if any one else hath made use, or thought of the like contrivance, it is more than I know : And withall, that though the one I make use of at present, be none of the best workmanship, nor exactly made after the description I have here given you (the boards having not liberty of gaping above $\frac{2}{10}$ of an inch) yet I have oftentimes the pleasure of seeing the *Index* turn no less than 10, sometimes 20 degrees, in an hour or two; and when the Ayr is changed, will return as swiftly, by the shrinking and swelling of the boards.

I have here withal sent you the Figure of an admirable instance of Natures luxuriancy in her contrivance even of Insects.

Tab. 1
Fig. 2.. Tis a Kind of large flying Beetle, of a dark shining brown, with a huge pair of horns, (in proportion to the body.) shaped and branched exactly like a Staggs, or Harts, from which last it hath its denomination; Our people in *Virginia* and *New England* calling it a *Flying Hart*. It flies high and swift, and rests most commonly upon branches or trunks of standing Trees; where, as soon as it has taken up its station, it begins with a shrill chirping voice, which it raises by little and little till it make the whole woods ring again, and then lessens gradually till it ceaseth with a kind of silent murmur, as if the little creature had rung it self asleep: Then flies to some other place, and begins the same tune again. Though I have seen and heard many of them, yet I never had the fortune to light upon any of them dead or alive but one, which notwithstanding I left in *Virginia*, but by good luck had first drawn the picture of it, according to the copy you have here*; which represents its shape and size exactly, as it lay upon a book

* See Fig. 2
before me. Where it is to be noted that the Horns are of a shining hard Substance, and that the tips of them touch the same plane with the belly. I could willingly have taken some pains to observe the anatomy of these pretty Insects, and their manner of breeding and propagation, but the season of the year together with my employment were both unfavorable to my desire, and I was therefore forced to desist without further satisfaction.

Though the Author in *Numb. 27.* of your *Transactions* seems inclinable to believe, that it is peculiar to the *Thames-water* alone, upon Stinking to be recoverable or potable again; I can affirm upon my own knowledge, that Water taken aboard at *New London* in *New England*, though in eight days time it stunk intolerably, yet when we came to *Virginia*, it recovered so perfectly, that I made no scruple to drink of it in harbour even when we had fresh water newly

newly brought from shore, nor could I easily perceive, it had any relicks of its late corruption.

That the Testicles of the Animal called *Musk-quash* do smell strong of Musk, as Mr. *Josselin** saith, is most certain: For, I have known some of them kept a long time in ones pocket, till they were become hard and black, and yet smelt as strongly as at first, which, in my opinion, was nothing inferiour to the scent of that, which is commonly sold for *Musk* in the shops. I remember, that one of our Seamen, being laid to sleep too near the fire-place, with one of these dried Testicles in his pocket; it happen'd that a coal burn'd through breeches and all to it, and made so great a scent of musk, that he might easily have been smelt a good way off, and the fire might perhaps have advanced where there was a worse perfume, had not the strength of this awaken'd the man, and so made him withdraw his breech in time. This Animal deserves to be further inquired into, especially if what Mr. *Theuenot* relates be true, *viz.* That Musk is nothing else but the Testicles of a beast like a Deer, found in the province of *Honan*, as 'tis noted in *Numb.* 14. p. 250. of your *Transactions*.

*See the account given of it in *Numb.* 85. P. 5024. of these *Tracts*.

Extract of a Letter, written to the Publisher by Mr. Leewenhoeck from Delft, April 21. 1676; Concerning the Texture of Trees, and some remarkable discovery in Wine; together with some Notes thereon.*

* The Numeral figures in the margin and body of this Letter refer to the like figures in the *Notes* made thereon.

S I R,

Monsieur *Constantin Hugens of Zulichem* was pleased to shew me the *Comparative Anatomy of the Trunks of Plants*, written by Doctor *Grew*, and told me, that he had very ingeniously and learnedly discoursed upon that subject; though I, by reason of my unskilfulness in the English Tongue, could have little more than the contentment of viewing the elegant Cuts.

I have formerly written unto you, *viz.* in my Letter of *August* 15 1673. that I had discovered in several Trees (1.) two sorts of vessels or pores, and did conceive, that the matter which serves for the increase of Trees was in (2.) the *greater vessels* sent upwards, and that some small particles did again descend in the *smaller Vessels* to the roots, whereby was maintained a (3.) *Circulation* also in Trees.

But not finding by the figures of Dr. *Grew*, that he hath discover'd those (4.) two sorts of Vessels in the woody part, I here take the

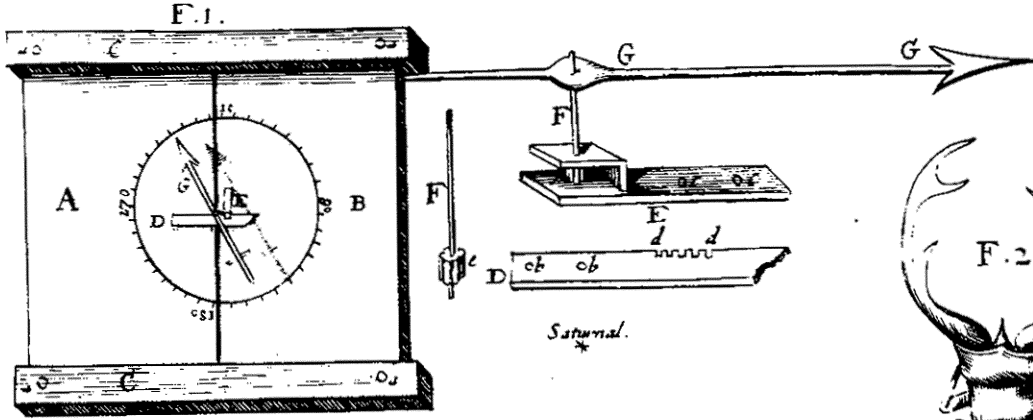
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