

*A discourse concerning the rising and falling of the Quicksilver in the Barometer; and what may be gathered from its great rise in Frosty weather, as to a healthy or sickly season; presented the Royal Society March 20. 1683. by the Learned Dr. Martin Lister, Fellow of the R. S.*

**I** Do not offer these things *Dogmatically* as though I had light upon certain *Truths*; but only as probable *Conjectures*, and such as may as well account for the *Phænomena* of the *Barometer*, as any I know. I am of opinion, That it is not good, if we intend the *Advancement* of *Natural Philosophy*, to let any part of it rest too long upon one *Basis*; For he that is once well pleased with an *Opinion*, naturally acquiesces, and seeks no further. However admitting the *Gravitation* of the *Air*, I have a mind to try how far I may go in some additional thoughts I have about the *Barometer*, though they may possibly be much different from what hath hitherto been proposed about it.

1. It is to be observed, that *Quicksilver* is not affected with the *Weather*, or very rarely, let that be either *Cloudy*, *Rainy*, *Windy*, or *Serene* in *St. Helena*; or the *Barbadoes*: and therefore probably not within the *Tropicks*, unless in a violent *Storm* or *Hurricane*. The first is affirmed by *Mr. Halley*, who kept a *Glafs* near two *Months* in the *Island St. Helena*, and the other of *Barbadoes* stands upon the *Credit* of our *Registers*.

2. In *England* in a violent *Storm*, or when the *Quicksilver* is at the very lowest, it then visibly breaks and emits small particles, as I have more then once observed; which disorder I look upon as a kind of *Fretting*; and consequently at all times in its *Descent*, it is more or less upon the *Fret*.

In this disorder of the *Quicksilver*, I imagine it hath  
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its parts contracted and cloſer put together; which ſeems probable, for that for Example, the *Quickſilver* then omits, and ſqueezes out freſh particles of *Air* into the *Tube*, which increaſing the *Bulk* of the *Air*, and conſequently its *Elaſticity*, the *Quickſilver* is neceſſarily depreſſed thereby, that is, by an external force or power; And alſo the *Quickſilver* muſt of it ſelf come cloſer together in its own internal parts, that is, deſcend for both reaſons.

And that much *Air* is mixt with it, appears from the Application of a heated Iron to the *Tube*, as is practiced in the purging of it that way; and alſo for that *Polifh Iron* will ruſt though immerſt in it, as ſome *Philoſophers* have lately obſerved.

Now whether the *Quickſilver* riſes in the *Pipe* ( which it certainly does in hot, and froſty weather ) it may then be ſaid to be in a Natural ſtate, free open and expanded like it ſelf, which it ſeems it ever is within the *Tropicks*, and with us only in very hot, and very froſty weather. But when it deſcends, it is then contracted, and as it were convulſed and drawn together, as it moſtly is in our *Climate* of *England*, and more or leſs, as we gueſs; in all places on this ſide the *Tropicks*. Which contraction plainly appears from the Concave figure of both *Superficies*, not only in that of the *Quickſilver* in the *Tube*, but alſo ( if well obſerved ) in that which ſtagnates in the *Pot*, or *Dish* it ſelf.

The difficulty ſeems to lye in the reconciling the ſame effect of the *Quickſilver's* riſing in the *Tube*, from ſuch ſeemingly differing cauſes, as great heat and intenſe Froſt, and thoſe who ſhall willingly aſſent to us in one particular, and grant us warmth, as a probable cauſe of its Reſtitution to its Nature, will yet be at a ſtand, how to imagine, that great *Froſt* likewise ſhould bring the *Quickſilver* nearer its own Nature too; I anſwer, that *Salts* liquified will coagulate or Criſtallize, that is, will return

to their own proper Natures, both in Cold and in Heat ; and therefore tho most men practice the setting them in a cool Celler for that purpose, yet some ( as *Zwelfer* ) advise, as the best means to have them speedily and fairly Crystallized, is to keep them constantly in *Balneo*. Thus also the *Lympha* of the blood doth become a *Jelly*, if you set it in a cool place, and the same is by warmth in like manner inspissated.

Again that its no new *Opinion*, that water is naturally *Ice*, if no disquiet from some external accident hinder. \* *Bornichius* the Learned Dane has said something for it ; And although some may think , that what he hath said, was a meer Complement to his own frozen *Climate* : yet I dare venture to add, in confirmation of that Doctrine, that *Salt* is naturally *Rock*, that is, naturally *Fossile*, not *liquid* ; And yet this is most like *Ice* of any thing in Nature ; not only because of its transparency, but also for its easy liquefaction, and the suddain Impressions and changes which *Air* makes upon it ; that its scarce to be preserved in its natural state of *Crystallization*. Also *Salts* of all sorts seem naturally to propagate themselves in a hard state, and to vegetate in a dry Form. The like is to be observed in *Quicksilver*, of its being a hard *Rock*, and also from its willingness to imbrace upon all occasions a more fixt State, as in its *amalgamizing* with almost all sorts of *Metals*.

It will not be amiss by way of *Corollary* ( and indeed it is one of the great uses too, of a *Register* of the *Air* ) to add a Note or two about *Healthful* and *Sickly* seasons, more particularly as they may refer to this *Phenomenon* of great *cold* and *Frost*.

If therefore *Quicksilver* and *Liquids* are nearest their own natures, and have less Violence done to them, in very *cold* and very *hot* seasons ; The *Humours* of our *Bodies*, as *liquids*, in all probability must be in some measure accordingly affected.

\* *Alex. arab.*

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And that therefore *cold* is healthful, I argue from the vast number of Old men and women to be found upon the *Mountains of England*, comparatively to what are found elsewhere.

Again, the *Blood* it self; or the *Vital liquor* of *Animals* equivalent to it, is in most kinds of *Animals* in Nature sensibly *cold*; for that the *Species* of *Quadrupeds* and *Fowles* are not to be compared for Number to *Fishes* and *Insects*: There being in all probability by what I have observed, above a hundred *Species* of these latter creatures whose *Vital juice* is *cold*, to one of the former: But because we most converse with those whose *Vital Juice* is *hot*, we are apt to think the same of all.

Again I have observed, which I offer as an Argument of the little injury intense *cold* does to the nature of *Animals*, I say, I have seen both *Hexapode-Worms* (which I compare to the tender *Embryo's* of *Sanguineous Animals*, because such are in a middle State) and *Flyes* of divers sorts hard frozen in the Winter, and I have taken them up from the *Snow*, and if I cast them against the *Glass*, they would endanger the breaking of it, and make it *Ring* like so much hard *Ice*; yet when I put the *Insects* under the *Glass*, and set them before the *fire*, they would after a short time nimbly creep about, and be gone, if the *Glass* which I whelmed upon them, had not secured them.

It hath indeed been noted by a very wise *Philosopher* in contradiction to our *English Proverb* \*, which saies, that a *Green Christmas makes a fat Church-yard*; That the last *Plague* broke out here at *London* after a long and severe winter 1665. But I reply, that that was accidentally onely, for that that *disease* is never bred amongst us, but comes to us by *trade* and *Infection*. Tis properly a *Disease of Asia*, where it is *Epidemical*. And therefore by the *Providence of God*, we are very secure from any such *calamities* as the Natural effect of our *Climate*.

And for the same reason, I judg the *small Pox* so much

\* *Ray's Proverbs.*

raging at present, not to be from the *Season*, or temperature of the *year*, but from *Infection* wholly; that also being an *Exotic Disease* of the *Oriental* People, and not known to *Europe*, or even *Asia Minor*, or *Africa* at all, till a *Spice* trade was opened the later *Princes* of *Egypt*, to the remotest parts of the *East-Indies*, whence it originally came, and where it rages more cruelly at this day than with us.

The like I think of the *Gripping* of the *Guts*, that it is a peculiar *Disease* of the *West-Indies*, and yearly received from thence, for this reason, that is none of the *Tormina Ventr̄is* of the *Antients*, and therefore called by a new name, by such as have writ of it; and also for that it is yet scarce known in any part of the *North* of *England*, or *Midland Countries* thereof \*.

So that we are not to *Judge* or *Prognosticate* of the *Salubrity* or *sickliness* of a year, from *forreign Diseases*, but by the raging of such as are *Natural* to the men of our *Climate*.

But enough of this, only this word to conclude, that if the most *Elegant* and learned *Rivinus* be in the *Right*, which I shall not here dispute, that fear is ever the prime cause of the *plague* †; 'tis fit to recommend its *antidote*; which is *cheerfulness*, and a reasonable security; that we are in no such danger from any *Intemperature* of the *Air* necessarily subsequent to so vehement a *Frost*.

\* Dr. Willis *Dysenteria Alba* Londinensis.

† Rivinus de *Peste* -- *Contagium non est contagium, nisi accedat terror* - *Sancto testor, me nullum hucusque vidisse ægrum ex peste, qui non a terrore eam contraxisset.*