This rising and falling of the green Weeds may seem strange to some people, but if they will be convinced by the Experiments of natural Philosophers whom I have followed several years, let them take a small Glass-bubble, such as is describ'd by Fig 10. Q R S T, leaving the small orifice at T open for the Water to run in and out, and let this Bubble be put into a Vessel with Water, they will find in Summer that by the dilation of the Particles of Air within the said Bubble, it will rise to the superficies of the Water, whereas the same Air, thro its elasticity, being contracted in cold Weather, will make room for the admission of a Mass of Water so much heavier than itself into the said Bubble, and then it will subside; and this will happen *toties quoties*.

IV. *A Letter from the Reverend Mr* William Derham, F. R. S. *to Mr* John Haughton, F. R. S. *containing his Observations on the Weather, &c. for some years last past.*

Upwinster, April the 5th, 1703.

I Lately sent my Weather and Tables of last year to Dr *Sloane*, and promis'd when I should hear from Mr *Towneley* in *Lancashire*, an Account of what he wrote that was curious: I have lately receiv'd Mr *Towneley*'s Letter, and take the occasion of that Letter to write now to you, to give you my hearty thanks for all favours that I have receiv'd from you; as well as to send you some of that ingenious, curious Gentleman's Observations of last year, and my own.

And first, As to the most remarkable Weather, especially Rain, of last year, and the effects thereof: Mr *Towneley* tells me, that it is a general complaint in the North of *England*,

land, that there were but ſmall Crops of Hay, which calamity befel the Southern parts alſo; the cauſe whereof may be perceiv'd by the following firſt Table of Monthly Rain; in which you may perceive the growing Months of *March* and *April* to have been dry Months in *Lancaſhire*, and *May* no wet Month, conſidering the quantities of the other Months, and of other Years publiſh'd heretofore in the *Philoſ. Tranſ.* Here at *Upminſter*, *April* was fortunately a wet Month, till the 23d, or elſe, no doubt, we ſhould have ſuffer'd more than we did in the want of Hay; for the growing Month of *March* was a dry Month, by the following Table; and *May* (which by the ſame Table ſeemeth to have had near a due quantity of Rain) was a very dry Month by the Tables ſent to Dr *Sloane*; for it appears by them, that very little Rain fell from *April* 23 till *May* 29, and then fell in great Showers, the greateſt quantity of that Months Rain. Mr *Towneley* doth not tell me particulars, but I gueſs it to be after this manner with them in the North of *England*; for beſides that *March* and *April* were dry Months with them, and *May* ſomewhat more wet, yet probably the wet of *May* did not fall early in *May*; for it appears by the following Table the third, that the Mercury was high, and in ſomewhat a fix'd Station on *May* 13.

Thus much for the Weather in the Spring-Months of the Year 1702. and the effects it had on Hay, which effects I have ſome reaſon to think extended to many parts of this Kingdom, beſides thoſe already ſpoken of.

As to the other Months there is little remarkable, beſides the vaſt diſproportions of Rain between *Lancaſhire* and *Eſſex*, which I ſhould ſcarce take notice of, if it was not what happeneth almoſt every year, as will appear by the following Table 1ſt, which I now ſend to compleat what hath been publiſhed in former years in the *Tranſactions*; the cauſe of this I cannot judge of, unleſs it be that *Lancaſhire* is a more Hilly Country than *Eſſex*, which ſort of Lands, as they more need wet than Vales and low plain Countries

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do, ſo have greater ſhares of it than theſe have, beſides I leave it to you and others to judge, whether ſomething may not be attributed to the Weſtern Scituation of *Lancaſhire* near the Sea; from which Quarter the Winds in *England* blow more than from the Eaſtward.

At the foot of the Table of Rain, beſides the quantity which fell in each year, I have added the depth thereof in Inches; or what depth it would have been of, if the Earth had not imbib'd it, but it had ſtagnated on the ſurface thereof.

For the ſatisfaction of your ſelf and others that are curious, I have added two Tables more, of the Stations of the *Mercury* in the *Barometer* at *Towneley* in *Lancaſhire*, and at *Upminſter* in *Eſſex*, with the differences thereof; and this obſerv'd at 3 times of the day, *viz.* in the Morning, and about 3 in the Afternoon at *Towneley*, but at noon at *Upminſter*, and at 9 a Clock at Night. One Table to the firſt day of every Month; the other the moſt remarkably Low, High and more ſettl'd Stations of the ☿ the laſt year 1702.

By theſe *Barometrical* Tables it may be ſeen whether at all, or how far conſentaneous to truth, that opinion is of ſome learned curious Men both in *England* and abroad, *viz. That the* ☿ *aſcendeth and deſcendeth in all places at the ſame time, and in the ſame proportion.* It is manifeſt, that the ☿ doth commonly riſe and fall in one far diſtant place, when it doth ſo in another, but not alike: Alſo when any conſiderable variation is in one place it is ſo in another; when remarkably high, remarkably high; when low, low; when a great aſcent or deſcent, generally the ſame elſewhere; but only the differences of all theſe are not in equal proportion in all places; all which ſeemeth reaſonable to be expected, by reaſon of the difference of Weather in different places, eſpecially as to wet and dry.

There is one thing more in the following third Table, which I think deſerveth eſpecial remark, becauſe I believe it to be the moſt conſiderable alteration of the *Mercury*, that

hath ever happen'd ſince the invention of the *Baroſcope*, and that was the deſcent on *Feb.* 3d and 4th laſt: Concerning which, Mr *Townely* in a former Letter gives me this account, "That on *Feb.* 3d the ☿ was at 3 in the Morning at 29. 15. "at 3. h. 28. 50. and at 10 at Night at 27. 5. The next day "it fell yet lower, and about 12 was at the loweſt, *viz.* "27. 39. but for an hour before and as much after, it varied "only ſo much as to make it ſenſible that it was fallen and "began to riſe again; the loweſt he had ever ſeen it before "was on *Nov.* 18. 1674. when it fell to 27. 63. That Mr "*Flamſteed* at the Obſervatory obſerv'd as remarkable a di-"ſcent of his ☿; and that it happen'd about the ſame time "of the day, *viz.* 2 of the Clock in the Afternoon at both "places.

And laſtly he tells me, "That the deſcent in *Feb.* laſt "was the greateſt that has been ſince the filling his Tube, "which was in *March* 1665. The particulars which I ob-ſerv'd here at *Upminſter* about that deſcent were, That on *Feb.* 2 the ☿ was high, *viz.* 29. 80, the next Morning 29. 50, at Noon 29. 16, at Night 28. 43, the next Morning (*viz.* *Feb.* 4.) at 7 of the Clock it was fallen to 28. 5, and was globoſe, as if it had riſen or was inclin'd to riſe; But it continu'd in the ſame ſtation till after Noon, and then began to riſe about 2 of the Clock, and roſe haſtily. The Weather accompanying was fair on *Feb.* 3d in the Morn-ing, Hazy at Noon, and Rain at Night, and a violent Tem-peſt in the Night, and all the next Morning, of *Feb.* 4th.

Thus, Sir, I have given you the trouble of a long Letter, but with no other deſign than to ſhew you my reſpects and gratitude. If you think any thing in it worth the cogni-zance of the *Royal Society*, you may communicate it if you pleaſe. However, I deſire you to do me the favour to ſhew it to Dr *Sloane*, becauſe I promiſed him what Mr *Townely* wrote, in which you will oblige me to add to the obligati-ons of

Yours, &c.

TABLE I.

A Table, ſhewing how many Pounds, and Centeſimals of a Pound *Troy* of Rain, fell at *Townley* in *Lancaſhire*, and at *Upminſter* in *Eſſex*, in each month of the years 1699, &c. with the Quantity and Depth every year.

	1699.		1700.		1701		1702	
	Townl.	Upmr.	Townl.	Upmr.	Townl.	Upmr.	Townl.	Upmr.
January	17 91	8 91	20 84	3 91	22 41	14 96	21 10	9 81
Febru.	32 70	60 5	19 12	7 64	16 78	8 78	21 27	7 30
March	17 92	5 63	7 58	1 55	7 10	3 91	2 48	2 37
April	10 47	3 44	18 65	7 60	6 11	1 43	5 34	10 90
May	4 00	2 67	17 92	6 91	19 67	9 11	8 81	6 49
June	10 37	40	13 15	7 60	11 34	5 79	23 00	13 46
July	16 51	6 36	15 26	4 24	17 58	9 49	25 31	4 39
Auguſt	19 77	8 57	12 05	8 14	23 66	6 57	20 12	6 88
Septem.	16 53	8 06	23 52	14 85	21 30	5 63	23 01	8 05
October	18 90	13 49	26 44	17 15	24 59	10 21	28 57	7 92
Novem.	14 65	1 91	13 69	5 24	25 60	8 22	37 11	14 05
Decem.	16 78	5 77	26 88	10 30	10 19	9 35	41 62	10 27
Total	196 51	75 55	215 30	95 13	206 32	93 45	257 75	101 89
Depth	39 302	15 110	43 060	19 026	41 266	18 690	51 55	20 378

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TABLE II.

A Table shewing the Height of the ☿ at *Townley* and *Upminster*, on the first Day of every Month in the Year 1702. three times a Day, *viz.* about 7 in the morning and 9 at night; and about 2 afternoon at *Townley*, with the difference of the ☿'s Variation, and its difference between both places.

First Day of the Mon.	☿ Heig. at Town	☿ Heig. at Upmr.	Dayly differ. at Town	Dayly differ. at Upmr.	☿ lower at Town
	29 06	29 28			22
Jan.	28 90	21	16	07	31
	58	10	32	11	52
	29 58	96			38
Feb.	40	91	18	05	51
	30	80	10	11	50
	36	68			32
Mar.	36	66	00	02	30
	40	58	04	08	18
	70	79			09
April	68	73	02	06	05
	69	79	01	06	10
	20	51			31
May		49		02	
	09	44	11	05	35
	56	78			22
June	61	82	05	04	21
	84	98			14
July	90 30	01	06	03	11
	92	11	02	01	19
	62 29	80			18
Aug.	49	74	13	06	25
	47	67	02	07	20
	92 30	09			17
Sept.	95	12	03	03	17
	95	11	00	01	16
	56 29	74			18
Octob.		76		02	
	54	75	02	01	21
	46	71			25
Nov.	50	75	04	04	25
	58	76	08	01	18
	35	50			15
Dec.		34		16	
	10	09	25	25	01

TABLE III.

A Table shewing the *Lowest Stations* of the ☿ in the Year 1702. at *Townley* and *Upminster*; with the difference of the ☿ at both places.

Day of the Month	☿ at Town	☿ at Upmr.	Differ
	29 15	29 50	35
Feb. 3	28 50	16	66
	27 50	20 43	93
		05	
4	39	05	66
		02	
	77	18	31
Dec. 23	71	12	41
	90	10	35
		25	

High Stations of ☿ An. 1702.

	Upmr.	Town	
	30 29	29 95	30
Jan. 30	25	95	30
	19	83	34
	33	30 02	31
Mar. 12	35	05	30
	32	07	25
	07	29 94	13
Oct. 21	18	99	19
	22	30 00	22

More settled Stat. An. 1702.

	Town	Upmr.	
	30 04	30 13	09
Apr. 27	00	15	15
	02	16	14
	03	16	13
28	01		
	29 99	15	16
	98	15	17
29	93	13	20
	86	06	20
	78	29 89	11
May 13	74	87	15
	74	87	13
	30	68	38
June 10	40	71	31
	44	70	26
	50	70	20
11	51	72	21
	59	70	11
	45	86	41
Aug. 30	57	86	29
	59	88	29
	73	91	18
Sept. 27	72	91	19
	73	91	18
	74	91	17
28	78	95	17
	73	93	20

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