

I. *An Abstract of the Meteorological Diaries communicated to the Royal Society, with Remarks upon them by W. Derham, D. D. Canon of Windsor, and F. R. S.*

PART I. Containing Meteorological Observations made at
Coventry, } 1707. | *New-England,* }
Upminster, } | *Upminster,* } 1715, 1716.

A TABLE shewing the Height of the *Mercury* in the Barometer, the Coast and Strength of the Winds, and the Weather, on the first Day of eight Months in the Years 1707 and 1703. Observed at *Coventry* in *Warwickshire* by Mr. *H. Beighton*, F. R. S. and at *Upminster* in *Essex*, by *W. Derham*, F. R. S.

COVENTRY				UPMINSTER.			
Month.	Barom.	Winds.	Weather.	Barom.	Winds.	Clouds.	Weather.
	Inc. Dec.			Inc. Cent.			
July.	29. 2 25 4	S 2 SW 3 2	Cloudy with Sun- shine.	29. 39 36 52	S 2 W 7	S W SW b W	Showers and Stormy.
Aug.	5	W 1 NW 1 1	Fair Sunshine Day.	58 51	W b S 0		Fair and some Clouds.
Sept.	15 25	SW 3 4	Rain. High Winds.	33 29 38	S b W 5 W b S 8	S S W	Storms with Showers.
Octob.	05 05		Much Rain.	13 14 14	WSW 6 7		Stormy Day.
Nov.	85 85	W 1 W 1	Cloudy.	81 84 82	NW b W 1		Cloudy.
Decem.	05	S W 3	Rain. Warm.	21			
Jan.	05	E 1	Tempe- rate and Misty.	01 06	NNE 0		Cloudy dark Day.
Febr.	65	N 2	Clear. Cold with Snow.	62 59 52	NNE 3 3		Frost and Snow w th Fair.

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A T A-

A T A B L E shewing the Coasting and Strength of the Winds and the Weather every first Day of the Month in the Year 1715, and the Quantity of Rain in that Month, observed at *Harvard-College in Cambridge in New-England*, by Mr. *Tho. Robie*; and the Height of the Mercury in the Barometer, the Coasting and Strength of the Winds and Clouds, the Weather and Rain at the same Time at *Upminster*, by *W. Derham*, F. R. S.

HARVARD-COLLEGE.

UPMINSTER.

Month.	Winds.	Rain.	Weather.	Barom.	Winds.	Clouds.	Rain.	Weather.
		Lib. Cent.						
Jan.	WNW	5. 17		30. 11	NE ³		4. 31	Hard Frost and Cloudy.
	WbN			10	2			
	S			14				
Febr.	SW ¹	12. 92	Hazy. Snow. Cloudy.	29. 75	WSW ⁷		3. 7	Stormy.
	SW ³			10				
	W ⁰			30. 10				
March.	W ¹	5. 14	Hazy. Cloudy.	29. 40	ENE ³		12. 53	Cloudy. Mistling. Rain.
	SW ¹			48	4			
	SWbW ¹			40				
April.		12. 71	Snow.	65	SbW ¹	S.	13. 19	Fair with Cloudy.
	NWbW ⁵			60	E ³			
				46				
May.	Calm.	13. 14	Frost. Serene.	32	SbE ⁴		4. 66	Rain. Fairer.
	E ³			39	SW ²			
	E ⁴			30				
June.	SW ²	13. 63		69	NNW ⁰	SW	16. 34	Fair with Cloudy.
	WNW ⁰			69	NW ²			
	SW ¹			72				
July.		14. 42	Showery.	65	W ¹		20. 00	Cloudy. Thunder and Rain.
	NWbW ³			71	NW ¹			
				77				
August.		9. 64	Serene and Pleasant.	30	NW ⁰	SW.	20. 49	Fog. Rain. Fairer.
	NW ⁰			28				
				28				
Sept.	NE ⁰	Sept. and Octob.	Fair.	55	SSW ⁴		9. 17	Fair. Rain.
	E ¹							
Octob.		30. 78		75	WSW ⁰		14. 08	HoarFrost Fair. Rain.
				72	1			
				50				
Nov.	W ⁰	7. 24	Fair with Cloudy.	54	SW ⁰		8. 53	Rain. Cloudy.
	NW ¹			54	WbN ¹			
	N ¹			38				
Dec.	W ³	5. 83	Fair and Cold.				2. 55	
	WNW ³			1				

A TABLE of the like Observations in the Year 1716, as those in the preceding Table, except the Rain in *New-England* which Mr. *Robie* omitted.

HARVARD-COLLEGE.

UPMINSTER.

Month.	Wind.	Weather.	Barom.	Winds.	Clouds.	Rain.	Weather.
						Lib. Cent.	
Jan.	N W ²	Cold and Clear.	29. 62	WbN ⁰			Thaw w ^a
	N W ²		59	NbW ⁰		8. 61	Misting & Cloudy.
Febr.	NwbW ¹	Cold hard Frost.	30. 15	NNE ²			Black Clouds.
	N ⁰		18			1. 76	
	E ⁰	Rain.	21				
Mar.	E ⁰	Fairer.	29. 42	WbN ⁰			Fair.
	N ⁰					1. 95	
April.	N W ¹	Cloudy.					
	S E ¹	Fair.	85	E b S ¹	S.		Fair and Pleasant.
	N W ⁶		85	E S E	S.	5. 04	
May.			80				
	N ⁰	Fair.	30. 00	N ²			Fair warm Day.
	E ¹		29. 97			9. 52	
June.	S ²						
		Rain.	94	NNW ¹			Cloudy.
			98	N b E ⁴	NNW	8. 24	Rain. Fairer.
July.			30. 01				
	N W ¹	Fair and Cool.	29. 91	N W ⁰	N b E		Fair Pleasant Day.
			92	W ³		4. 47	
Aug.			90				
			88	W - W ¹	N W		Cloudy.
			88	N W ⁴		2. 11	Fairer. Cloudy.
Sept.			92				
	S W ²	Fair and some Clouds.					
						9. 87	
Octob.	W ¹	Fair.					Cool
	S W ²	Hoar-Frost.	51	W b S ⁰			Dark Day.
	S ¹		52			15. 75	Rain.
Nov.			50				
	W ¹	Fair and Pleasant.					
	WNW ¹					4. 41	
Dec.							
	N ¹	Cold and Raw.	68	NbW ²			Frost and Fair.
	N E ²	Snow.	87			7. 16	

REMARKS on the foregoing TABLES.

In that for the Year 1707.

I. **I** Observe there is a great Agreement between the *Barometers* at *Coventry* and *Upminster*, in their *Rising* and *Falling* near the same Time, at least not many Hours before or after one another, and for the most Part in the same Proportion. Also when one is *Stationary*, the other is so too, especially if of any Continuance: But at *Coventry* the *Mercury* is lower than at *Upminster* about a tenth of an Inch, the Situation at *Coventry* being, I suppose, higher than that of *Upminster* about 82 Feet, according to my Experiments in *Philos. Transf.* Numb. 236.

II. I observe also a greater Conformity between the Winds, than (considering the Causes of their perpetual Change) would be imagined. For although they may vary a Point or two, yet generally through all the eight Months, they tended nearly towards the same Point of the Compass, and changed in one Place as they did in the other; especially when they blew strongly, or were of some Continuance. I have observed, that a Storm in one Place is so in the other; of which the Diaries at large give many Examples; and in this Table of 1707, in the Months of *September* and *October*, where Mr. *Beighton* hath noted the Winds Strength to be three and four, it is about the same Strength with mine of five, six, seven and eight, I taking in more Degrees of the Strength of the Winds than he.

III. I observe also, that the Weather in each Place is for the most Part nearly the same.

IV. I have often observed, that the Falling of the Quickfilver in dark and cloudy Weather betokeneth Rain; but the Rain is always preceded with Fair Weather: And when the Fair comes, the Foul is not far off. And this chiefly happens, when the Wind is in any of the Easterly Points.

V. In *January 1706*, many were troubled with cuticular Eruptions, which itched much. After this the Measles were epidemical 'till the latter End of *May*.

VI. The Beginning of this Year being very dry, and often the Weather cold (as appears by my Tables at large) Hay was scarce, and became very dear.

VII. *July 8*, commonly called the *Hot-Thurfsday*, was the hottest Day that hath happened since I began my Meteorological Observations. A young Man (once my Servant) working in Harvest harder than ordinary, was overcome with the Heat, and died: And diverse Horses on the Road that Day, dropped down, and died also.

VIII. In *November* and *December* the Air being moist, and frequently cold, Coughs were epidemical with us.

IX. I hope I shall be excused if I go out of the Bounds of this Table, and observe that the unseasonable Frosts in *April 1708* (particularly *April 25th* and *26th*) blasted the tender young Leaves and *Catkins* of the Oak, Walnut-Tree, &c. which I take to be the Reason that few Acorns and Wallnuts were that Year. From whence it is a just Conclusion, That the *Catkins* are of greatest use to the Fertility of such Trees that bear them; but whether as a Male-Sperm I shall not determine.

X. This

X. This Month of *April* also Horses were every where seized with dangerous Coughs; of which many died in *London*, and other Places, especially such as laboured on the Roads. I have great Reason to think these Colds were catching, because my Horses that went well to *London*, returned with great and sudden Colds.

XI. *June 11* (although it was the Day of the Summer Solstice) was ensued with a very cold Night, my Thermometer descending nearly to the Point of an Hoar-Frost.

REMARKS on the TABLES of
1715 and 1716.

The late ingenious Mr. *Robie*, at my Request, was pleased to make, in *New-England*, *Meteorological Observations*, Morning, Noon and Night, to correspond with mine at the same Time at *Upminster*.

These Observations he made in 1715, &c. to the End of 1722, and ordered them to be sent to our *Royal Society*; and accordingly I received them, not long since, from his ingenious Successor at *Harvard-College*, Mr. *Is. Greenwood*, and now present them, with my own, to the *Society*.

But by reason they are too long to be read at the *Society's* Meetings, or to be inserted in the *Transactions*, I have therefore made the foregoing Extract from them, together with some Observations of my own, which tally with them.

But I am sorry that Mr. *Robie's* Observations want those of the Barometer and Thermometer: Neither of
which

which Instruments was to be gotten in *New-England*. Could we have had those Observations, they would have been of great use in several Phænomena of those distant Places, which now I can only guess at :
And,

I. I guess, that notwithstanding *Harvard-College* is ten Degrees more South than *Upminster* (it being, as *Mr. Robie* says, in *Lat. 42 Deg. 25' North*, and *Longitude from London 4^h 44'* as corrected by the best Observations, that I say) they have as cold, if not colder Seasons than we have here.

II. Although the ordinary Agreement or Disagreement of the Winds, deserves no Remark, yet it may deserve Observation, That when the Winds have continued long in one Point, they have nearly agreed in both Places, and especially when they have been high, and strong for some time. In which Case I have observed, that there have been some Days Difference in the coming of those Winds, as if they were so many Days in their Passage from Place to Place.

And this Agreement of the Winds, together with that of the Ascent and Descent of the Quicksilver before-mentioned, diverse curious Observers have taken Notice of, as well as my self, between distant Places, though not so far as *New-England*; as *Zurich*, *Paris*, *Lancashire* and *Upminster*; as may be seen in the *Philosoph. Trans.* particularly Numb. 208, 286, 297, and 321.

III. I observe, that they have in *New-England* many more *Parelij*, *Halo's*, *Lunar Rainbows*, and such like Appearances: Also more *Earthquakes*, *unusual Meteors*, *Thunder* and *Lightening* than we have.

IV. The

IV. The *Rain* in 1715 (which was the only Year in which Mr. *Robie* observed it) in the different Months, amounted to different Quantities; but in the whole Year, it was nearly the same as at *Upminster*; that at *Harward-College* being 130,64 *tb.*, that at *Upminster* 128,92 *tb.* But considering that Mr. *Robie's Tunnel* that received his Rain, was but 11½ Inches in Diameter, and mine exactly 12, therefore the Proportion of the *New-England Rain* may be accounted somewhat the greater.

V. I observed at *Upminster*, that in *January* the Contagion which was very fatal among the *Black Cattle* about *London* the latter End of the last Year, came amongst us, and destroyed many.

In *March* many were afflicted with *Head-aches*; and the *Small-Pox* was epidemical: And the Earth being very dry, the Ponds empty, and the Springs low, in that and the next Month there fell good Store of seasonable Rain, as the Table for that Year shews, but not sufficient to fill the Ponds. But in *June, July* and *August*, more Rain fell than was welcome; which filled the Ponds, but hurt the Hay, and Corn, and made the Ways as dirty as in Winter.

In the Summer this Year I had many Confirmations of some former Observations in my *Physico-Theology*, *Lib. I. Ch. 3. viz. That a cold Summer is commonly a wet one.* Which this Summer was, the Spirits in the Thermometer being often low, particularly near the Point of *Hoar-Frost* on *August 12.*

In *January*, the following Year 1716, the River of *Thames* was frozen for several Miles, and particularly so intensely at *London*, that whole Streets of Booths were erected on the Ice, Oxen roasted, Coaches driven

driven, and many Diversions exercis'd above Bridge. And so strong was the Ice below Bridge, as to allow People to walk and skate at their Pleasure thereon. But yet the Spirits in the Thermometer descended not all the while near so low, as on *December 30*, 1708.

In *Scotland* also (which in 1703 felt but little of that Year's severe Frost) the Ice was strong enough to bear the Horse and Foot of the Armies.

And beyond Sea they suffered much; particularly in *Spain*, much Mischief was done by the wild Beasts, which were forced by the Frost out of the Woods.

Among *Birds* I find the *Goldfinches* to have suffered much, having scarce seen one of them all the following Part of the Year; they being killed by the hard Weather, or driven to seek Food in other Parts.

On the — Day of ———, the Wind was so violent, that the *Thames* was emptied from *London-Bridge* as far as ———, so that only a small Rivulet of Water, no bigger than a Brook of 10 or 12 Foot over, remained; insomuch, that People walked on the Bottom, and found Treasure there.

In *November* and *December* Pleurifies were frequent, and mortal in our Parts of *Essex*. The Weather was mild, open, dark, and damp for the most part, with now and then a cold Day or two.

Farther REMARKS from Mr. Robie's Papers.

On *February 12*, 1713, he notes an *Earthquake* to have been at *Salem Village*; and on *Octob. 21*

following the Day was so dark, that People were forced to light Candles to eat their Dinners by. Which could not be from an Eclipse, the Solar Eclipse being the 4th of that Month.

On Feb. 13, 171 $\frac{1}{2}$, he observed an Immerfion of the first Satellite of *Jupiter*, at 10^h 48' 17"; and on Feb. 8 I observed an Emerfion at 8^h 7' 30"; according to which the Difference of *Longitude* between *Harvard-College* and *Upminster* is 4^h 45', and Mr. *Robie* fays, that it is 4^h 44' from *London*, by the lateft and beft Observations.

Sept. 23, 1717. Mr. *Robie* observed the Solar Eclipse

The Beginning at	12 ^h 23'
The Middle at	1 ^h 47' or thereabout.
The End at	3 ^h 5' 10" <i>p. M.</i>

About 9 Digits were Eclipsed.

Octob. 5 following he observed the *Southing* of the Moon, at 9^h 32' *p. M.*

On Feb. 25, 171 $\frac{1}{2}$, Mr. *Robie* faw the *Moon* cover *Aldebaran* at about 9^h 18' *p. M.* and the Star to emerge at 10^h 20' *p. M.* then by his Meridian Instrument (such as I have described in *Philof. Transf.* Numb. 291) being 2' too flow; fo that 2' are to be added to the Time mentioned.

March 10, 171 $\frac{1}{2}$, Mr. *Robie* observed an Emerfion of the first Circumjovial at 10^h 45' 35".

Sept. 24, 1718, Mr. *Robie* observed the *Moon* to *South* at 9^h 38', or thereabout: On the 25th at 10^h 22' 32" *p. M.* On the 26th at 11^h 26' *p. M.*

Decemb. 5, a great *fiery Meteor* was feen in the Morning about Break of Day. And on the 9th, about half

half an Hour after Ten, in the S S W, he saw another, which made a Light like the Moon.

Dec. 19, the Moon southed at 6^h 45' 45" p. M. On the 20th at 7^h 30' 56". On the 23d at 9^h 54' 5". On the 25th at 11^h 47' 33".

On Jan. 13, 1715, the first *Circumjovial* immerged at 10^h 35' p. M.

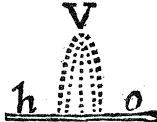
Jan. 17, The Moon southed at 5^h 52' 1". On the 19th at 7^h 33' 1". On the 22d at 10^h 21' 40" p. M.

Feb. 16, Moon southed at 6^h 15' 15": On the 19th at 8^h 59' 40": On the 21st at 10^h 54' 30" p. M.

On Dec. 11, 1719, a very unusual *Meteor* was seen in the Evening.

On Jan. 8, 1712, Mr. Robie says an *Earthquake* was.

On Nov. 24, 1720, Mr. Robie observed a *Streaming* from the Northern Horizon; as I did on Nov. 22 before.

On Dec. 10, 1720, about 8^h p. M. Mr. Robie first saw the *Light* that strikes up toward the *Pleiades*; and on Jan. 6 following, he found it was increased, and almost reached to the *Pleiades*. And Dec. 7, 1721, he observed the same; and on the 25th he hath given this Figure of it:  *h* *o* is the Part next the Horizon; *V* the Point toward the *Pleiades*.

This *Glade of Light* is the same that Dr. *Childrey* mentions in his *Britan. Bacon.* under the Name of *Semita luminosa*; and which I saw, and gave a Figure of in *Philos. Transf.* Numb. 305.

*Observations of the Eclipse of the Moon on
June 28, 1721.*

About Two in the Morning Mr. *Robie* viewed the *Moon* with his eight Foot Telescope, and she was untouched.

Time Correct.

H.	'	"	
2	10	00	A thin Penumbra.
2	12	00	Shadow is plainly entered.
2	18	10	<i>Palus Mareotis</i> covered.
2	31	40	<i>Mons Porphyrites</i> touched.
2	34	20	— — — covered.
2	47	10	Moon eclipsed about six Digits.
2	49	05	<i>Besbicus</i> just touched.
2	50	30	— — covered wholly.
2	53	40	<i>Byzantium</i> touched.
2	54	10	— — covered.
3	05	40	<i>Palus Meotis</i> touched.
3	18	30	Moon wholly covered.

There remained a Light on the Western Side of the Moon for some Time.

About 3^h 50 in the Morning the Moon was wholly hid by the Haze, and coming on of Day-Light, that nothing could be seen of her; although from the Immersion 'till now she was visible.

The Observations Mr. Robie made on the Solar Eclipse, Nov. 27, 1722, were as follows:

H.	'	"	
7	27	00	He saw the Sun rise eclipsed about four Digits on his supreme Vertex; to the S W the greatest Part of the Shade lay.
			Then we could observe no more 'till
8	30	00	The Sun began to appear, and six Digits, or thereabouts, were eclipsed.
8	55	15	The Sun was eclipsed $4\frac{2}{3}$ nearest; and then the Sun's Diameter was to the Moon's, as 1000 to 972.
9	00	15	Were hid $4\frac{1}{2}$ nearly; and the Sun's Diameter was to the Moon's as 1000 to 975.
9	19	45	A little Spot on the Sun emerged.
9	25	45	I saw the Moon go off the Sun, and Mr. <i>Danforth</i> at the same Time: And Mr. <i>Appleton</i> at
9	25	20	

II. *The Description of a new Quadrant for taking Altitudes without an Horizon, either at Sea or Land. Invented by Mr. John Elton.*

THIS Instrument contains four principal Parts, *viz.* a Frame, an Index, a Label, and a Shield; and these consist of several Parts. (*Vid. Tab.*)

The