

riplying this Value *per* Ounce, by the Number of Ounces the Stone sustains, will give the Value in Money of the Stone proposed.

VI. *An Account of a Book entituled, Jo. Frider. Weidleri Observaciones Meteorologicæ & Astronomicæ, Annorum 1728 & 1729, &c. Wittembergæ, Anno 1729.*

THE Author, after dedicating his Tracts to the Royal Society, gives a Description of the particular Sort of Barometer, Thermometer, Hygrometer, and Hyetometer, which he made use of in the subsequent Observations. The first of these is a Diary of the Weather, from the Vernal Equinox of the Year 1728, to that of the Year 1729; containing the daily State of the Barometer, Thermometer, Wind and Weather, together with the Quantity of Rain during that Time. To this he annexes some *select* Meteorological and Astronomical Observations, which he describes more at large.

The first he takes Notice of is a remarkable *Halo* round the Moon, on *February* 20, 1728, at forty-five Minutes past Seven in the Evening, when the Moon was not far distant from the Meridian, and about her first Quarter. The Diameter of the *Halo* occupied about 47 Degrees, being extended from ϵ in *Procyon* to *Capella* towards the West. Its Arch was $4\frac{1}{2}$ Deg. broad, as far, for Instance, as α and ϵ in *Procyon* are from each other. Within it was red, and towards the Extremity was pale; exhibiting entire a beautiful Spectacle

Spectacle for about four Minutes, but he did not know when it began. Before it dispersed, some thin white Clouds began to pass over it transversely, and then it was broke towards the West, the Redness of the dispersing Vapours greatly encreasing: After which the Sky became clear again. The same Day at Noon, he observed thirteen Spots on the Sun, the largest equalling $\frac{1}{4}$ of the Sun's Diameter; and the Spirit fell to 90 Degrees of the *English* Thermometer.

April 4, 1728, he observed an *Aurora Borealis*.

On *June 20*, another, which is described in the *Act. Erudit. Lipsj. Ann. 1728. p. 375*.

October 7, a very remarkable one appeared in the N. E. A *White Arch*, extended between the W. and N. E. quickly assumed a black Colour, and then divided into three other concentrical Arches equally black. From these some Radiations arose as usual, but shorter. A little afterwards these likewise ceased, and the black Arches were converted into luminous Tracts, only one remained till eleven o'Clock: And whereas at first the lowermost Arch was raised seven Degrees above the Horizon, it was now depressed towards it, being scarcely two Degrees above it.

The Author next proceeds, and gives fourteen Astronomical Observations, ten of which are of the Eclipses of *Jupiter's Satellites* at different Times. In making these he was guided by *Cassini's* Tables for the Meridian of *Paris*, and by comparing the Time when they should happen, as therein specified, with the Time he observed them at *Wittemberg*, he collects the Difference of Meridians of that City and *Paris* to be 41 Minutes.

The eighth Observation contains his *Calculus* for the total Eclipse of the Moon which happened *February 13, 1729, N. S.* but the Heavens being very cloudy, he could not observe the Eclipse itself.

The ninth is an Observation of *Mercury, March 4, 1729*; at which Time the Planet was farthest from the Sun, and remained some Time above the Horizon. Making use therefore of a twenty-two Foot Telescope, he observed its Phase almost bisected, and its Diameter appeared equal to a third Part of the Diameter of *Venus*, this Planet being above the Horizon, and seen at the same Time.

The thirteenth is a Conjunction of *Venus* and the *Moon, viz. April 2, 1729.* At 7 H. 13' he observed *Venus* placed in such manner near the *Moon*, that the Horns of the *Moon* were in the same right Line with *Venus*, which was then distant from the Southern Cusp of the *Moon* 1 Deg. 10'. At 7 H. 30' he measured the Distance of *Venus* from the Eastern Cusp of the *Pleiades* to be 2 Deg. 15', and the Horn of the Moon at the same Time was distant from the same Cusp 1 Deg. 53', 45"; the intermediate Distance of the Horns of the *Moon* was 29' 30".

His last Observation is on the Declination of the Magnetical Needle in this and the former Year, which he defines to be 12 Deg. 0' 55" West at *Wittemberg*, at this Time.

These Observations are followed by the Author's Account of the last hard Winter. This set in sooner than usual, the Rivers being frozen the 19th of *September*, though they used not to be so till the Winter Solstice, and the Spirit of Wine in the *English* Thermometer, on *September 21*, fell to the 66th Degree:

At

At which Time a N. E. Wind blew very strong. Afterwards, on *October* 3, the Spirit fell to 72 Deg. and the Ice was half an Inch thick on standing Waters in the Fields, so that even then it might be judged, that the Cold would be more severe than is usual in their Parts. From this Time the Frost did not at all abate, but continued much in the same State the Month of *October*, except on the 20th Day, after a S. W. Wind had blow'd pretty hard for some Days, the Cold was observed to encrease remarkably. The Beginning of *November* a strong East Wind continuing to blow for six Days, the Spirit sunk to 86 Deg. on the fifth, and the Ice was much thicker. On the 28th it fell to 96 Deg. after which they had no Rain, but all Vapours were congealed into Ice and Hoar. On *December* the 2d, the Spirit of Wine stood at 96 Deg. but on the 4th at 99 Deg. so that it not a little exceeded the Limit of intense Cold. Hence a S. W. Wind intervening now and then, the Cold seemed to abate a little; but that, and sometimes a N. E. Wind blowing stronger on the 21st, 22d, and 23d Days, it so prepared the Air, that on *Christmas* Day the Spirit in the Thermometer stood at 96 Deg. and the Cold was intense. Hence the Winter grew immediately more severe. The Wind almost always blew from the E. or N. so that on *January* 20, the Cold was almost intolerable, on which Day the Spirit descended to the 126th Deg. very little remaining above the Ball of the Tube; and this was the greatest Degree of Cold at *Wittemberg*. After this the Winter somewhat declined. A S. W. Wind blew fresh sometimes; but afterwards a N. and E. Wind restored the Cold on *February* 3, when the Spirit stood again at 86 Deg. On the 4th it fell to

95 Deg. and from this Time, barring a few Days, always in a Morning it reciprocated between 80 Deg. and 100 Deg. to *March* the 8th, on which it exceeded 106 Deg. and on the 9th it was forced down by a N. E. Wind to 110 Deg. But although the Spring was at Hand, yet the Severity of the Weather did not cease, as appears in that the Spirit of Wine, in the *English* Thermometer, in a Morning always stood at, or under the 80th Deg. of the Thermoscopick Scale; nay, even on *March* the 21st, on which Day the Equinox precisely fell, it was at 81 Deg. At length, on the last Day of *March*, the Weather grew milder, from whence may be taken the true Beginning of the Spring; not but that all *April* was much colder than usual.

Thus far from Thermoscopical Observations. After this, the curious Observer proceeds to shew its Severity from some of the more remarkable Effects the Cold had on the Rivers, Plants, and Animals. As to the first, he says, that the *Elbe*, both at *Wittemberg* and other Places, was covered on *December* 29, with a perfect Bridge of Ice, which bore both Men and all Sorts of Carriages. This remained till *February* 28, when it grew thinner, and broke considerably; but the Cold returning on *March* 8, it re-united, and was as firm as before, till *March* 29. The Water within the Houses, and in the Bed-chambers, where were good Fires, was wholly congealed, and the Rind within on the Windows stuck for many Days, when the Wind was either E. or N. though the Room was well warmed. Examples of the other Kinds were several. Many Persons perished in their Journeys, and more lost their Limbs in a very short Time: So that near the
Elbe

Elbe they could not work abroad. It killed also many Animals immediately. The Crows, which can bear intense Cold, fell dead from the Trees: Stags, Goats, and Hares perished in great Numbers. The Plants likewise felt its Violence, and the more tender Trees were damaged. The Limes were every where injured: The greater Branches of the Plumb-trees, Apricots and Peaches, were dried up; but the Vines suffered most, the more robust being shriveled to the very lowest part of their Trunk, unless guarded by a Wall, or some other Covering.

From these Observations the Author compares this Winter with the memorable one of 1709, and proves both from Thermoscopical Observations; from its Effects upon the Earth and Animals; from its longer Continuance, and from the greater Extent of the Cold into the more Southern Parts, that this last much exceeded the former, at least in *Germany*.

Having thus finished the History, he lastly enquires into the probable Causes of it. He takes Notice, that the Winter foregoing was moderately cold and dry; and as a cold Summer succeeded, and alike dry, in which the North Winds blew most frequently, and during the hottest Months of *July* and *August* the Sky was covered with dark and black Clouds, the Earth was prepared for Frost; to which the remarkable Dryness of the Season did not contribute a little, as Barometrical Experiments shew, that a dry Air cools sooner than a moist, and is both heavier, and retains Cold longer. Neither does he think it altogether foreign to Truth, to reckon the remarkable Frequency of the *Aurora Borealis* to be a Prefage of a colder Winter than ordinary, which has been observed to be followed
by

by cool and serene Weather : As also the unusual Number and Largeness of the Spots on the Sun's Disk, for almost two Years together ; by which Means, in such a Length of Time, the Force of its Rays might be obstructed in some Degree, and the colder Winds thereby have Liberty to prevail. The Air by these concurrent Causes being rendered very cold, the Encrease, and extreme Degree of it proceeded from the great Cloudiness of the Sky ; and the blowing of the N. E. or E. Wind, so remarkably observable for the most part of the Frost.

VII. *Occultatio Veneris à Lunâ subeunte Berolini visa die 19 Septembris 1729, N. S. p. mer. à D. Kirchio. Ex Diario Meteorologico (M.S.) J. Fred. Weidleri, L. L. D. & Math. Prof. Prim. Wittembergæ.*

CONTIGIT Accessus Lunæ ad Venerem 2H. 2' 16". Occultatio totalis 2 H. 3' 1". Idem, per Telescopium octodecim Pedum notavit Venerem ferè in Quadraturâ positam, cum prope Lunæ discum accederet, figuram mutasse, & Falcis cuspides amisisse ; unde Ovalis vel Elliptica figura oriebatur : Quod spectaculum pro comprobandâ Lunæ Atmosphærâ laudari posse *D. Kirchius* censet.

L O N D O N :

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