

taken in the drawing. *I*, the penumbra. *K, K*, the sliders. *L, L, L, L*, pulleys, over which the line runs, that moves the penumbra. *M*, the handle, to which both ends of the line are fixed. *N*, a collar on the axis of the handle. *O, O*, the rings on the pedestal.

LXVIII. *A Letter from the Reverend Henry Miles, D. D. F. R. S. to Mr. John Canton, F. R. S. concerning the late bard Weather.*

Dear Sir,

Read Feb. 28, 1754. **I** Thank you for your account of the state of your thermometer, on the days most remarkable for cold this season; and, in a paper inclosed, have sent you the register I made of my thermometer (see p. 527.), on the same days, according to your desire; which, if you please, you may lay before the Royal Society, with the few following remarks:

You tell me, you have never before observed so great a degree of cold; nor have I, for several years before you began to make your observations, or since you did. It was in the year 1740. when I, occasionally, hung a mercurial thermometer abroad; and in February, the following year, constantly. Not having heard, that any one had used to do so, I was led to it, by a very sensible warmth in the air, which I perceived upon accidentally looking out at my window, a good while before day: So that I cannot undertake

to

to ascertain the degree of cold, which we may have had, higher than that time.

The near agreement between your register and mine is remarkable, at noon and night, when the observations were made at the same hour. The considerable difference, on the 7th instant, *a. m.* when your thermometer was 6 deg. higher, I attribute, partly, to your observation being made an hour later than mine, and after the sun had been above the horizon three-quarters of an hour: For I have found, by long observation, that the coldest time of the day, in general, is between an hour, and half an hour, before the sun rises. But, perhaps, this difference may likewise have been occasioned, in part, by warm steams transpiring the earth, at that time; for I have several times observed our sudden thaws, this winter, to have been attended with circumstances, which led me to think they had their rise from such a cause. Some mornings, in a great frost, have been universally clear before day; when, having registered the station of the mercury, I afterwards frequently viewed the thermometer, and found it to rise 3, 4, or more, deg. when another, which I always register with it, and is on the same side of the house, but at a window of a room one story higher, has not risen at all. From whence I expected a thaw, and never have been deceived. It has, in an hour's time, grown cloudy, and the thaw visible, and this before sun-rising, and without any change in the wind; which maketh it probable, it must have been caused by a subterranean heat, passing thro' the surface of the ground.

I beg leave to make one observation more, which is, that the air in my chamber, which is mostly shut up,

up, hath not, upon a continued thaw, acquired the same degree of warmth with that abroad, sometimes, under three whole days. I am, dear Sir,

Your, and the Royal Society's

most obedient humble servant,

Tooting, Feb. 28,
1754.

Henry Miles.

P. S. On Dec. 31. last, my thermometer stood at the same degree, as it did on the 7th instant, in the morning; which times were the coldest, that I have observed this season.

Register of the thermometer at Spital Square, in London.	Register of the thermometer at Tooting, in Surrey.
Feb. 1754.	Feb. 1754.
Day 6. At 7 ^h $\frac{1}{2}$ a. m. against the house 17 and in the garden 15 At 2 p. m. against the house 27 $\frac{1}{2}$ At 8 p. m. - - 21	Day 6. At 4 ^h $\frac{3}{4}$ a. m. against the house, clear 15 and never lower after. At 2 p. m. clear - - 28 $\frac{1}{2}$ At 8 p. m. mostly clear - 20
Day 7. At 8 a. m. - - 20 At 2 p. m. - - 30 At 8 p. m. - - 26	Day 7. At near 7 a. m. clear - almost 14. At 2 p. m. partly cloudy - 31 At 8 p. m. clear - - 26
Day 8. At 8 a. m. - - 26 At 2 p. m. - - 32 At 8 p. m. - - 28	Day 8. At 6 a. m. cloudy - - 23 At 2 p. m. cloudy - - 33 At 8 p. m. cloudy - - 28
Day 9. At 8 a. m. - - 26 At 2 p. m. - - 35 $\frac{1}{2}$	Day 9. At 6 a. m. cloudy - - 23 At 2 p. m. cloudy - - 36 $\frac{1}{2}$

The Reverend Dr. Bradley having observed his thermometer, at the Royal Observatory at Greenwich, to stand at 14 $\frac{1}{2}$, on the 6th inst. about 7^h $\frac{1}{2}$ a. m. it may be presumed to have stood some deg. lower before that time of the morning.