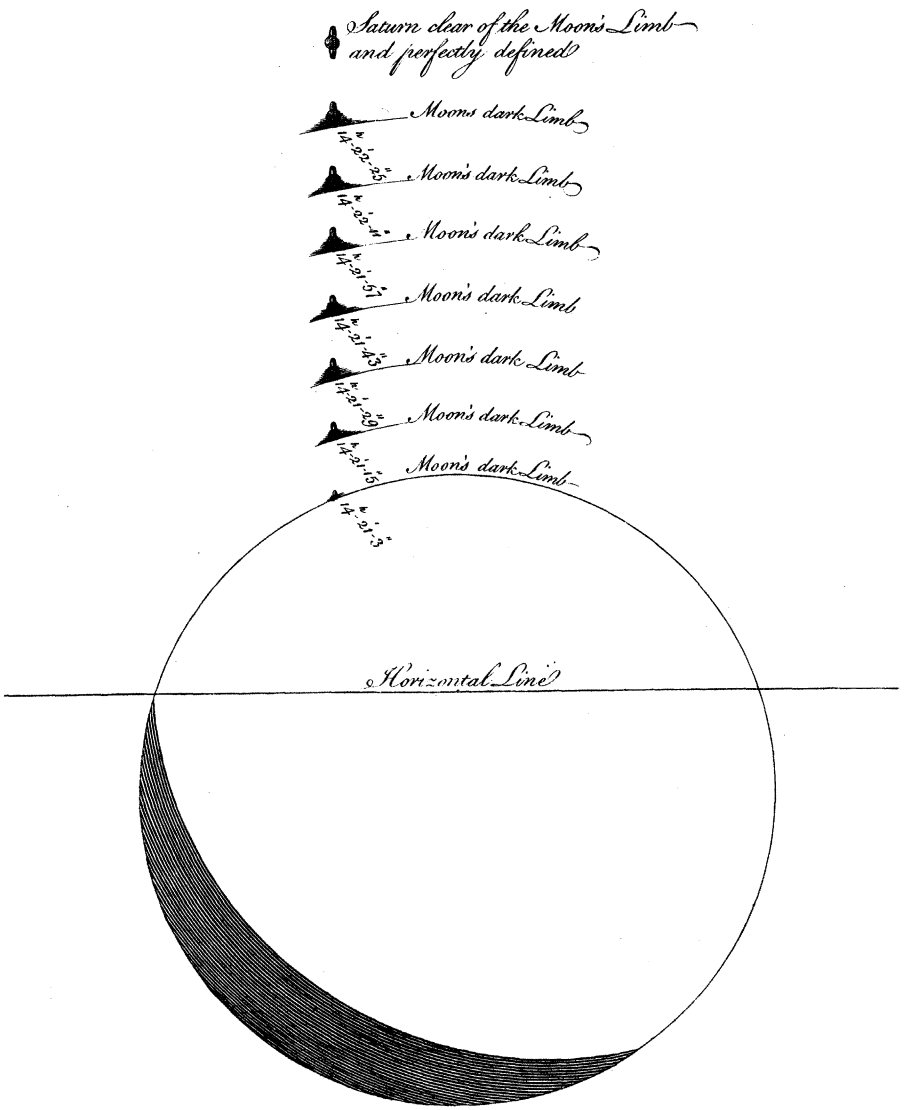
# XCIV. *Certain Reaſons for a Lunar Atmoſphere; by Mr.* Samuel Dunn.

Read July 1, 1762.

IT has been a queſtion which has been long debated among aſtronomers, whether the Moon has an atmoſphere or not? and, as far as I have been able to learn from reading and verbal inquiry, the queſtion is yet undecided. The beſt aſtronomers I have talked with about this matter, have told me they never could diſcover any atmoſphere about the Moon. But this being unſatisfactory to me, I began to conſider with myſelf, by what methods, not already uſed, this problem was likely to be ſolved; and, among ſeveral others, thought of one, which I don't know that it has been uſed before; namely, by a nice examination of the two ends of Saturn's ring, at ſuch time when the planet is on the dark edge of the Moon. For the ring of Saturn being of a conſiderable length, and gradually emerging or immerging almoſt at right angles, either from or to the dark diſk of the Moon, the two extremities of this ring, and the body of Saturn, being duly obſerved, if both the preceding and ſubſequent extremities of the ring, and the body of Saturn alſo, ſhould happen to appear not perfectly defined, exceedingly near to the Moon's dark limb, but perfectly defined a little further therefrom; from ſuch an appearance, I conclude it might be ſtrongly preſumed, that there is a lunar atmoſphere; and for want of ſuch appearance, that there is none.

Such

The Appearance of **SATURN**, as Emerging from behind the Dark Limb of the **MOON**, 16. June 1762. At 14. H. 22 M. appt. Time at Chelsea.



Such an obſervation I made 16th inſtant, or rather 17th, paſt two in the morning; the particulars of which follow. [*Vide Tab.* XVIII.]

The 16th, at noon, I ſat a pendulum-clock, by which this obſervation was made, to ſolar time, by the Sun's tranſit over the meridian, and determined with myſelf to uſe a Gregorian reflecting teleſcope, magnifying 55 times, as the ſame would be eaſily manageable (and no riſque would be run of miſſing the point of either immerſion or emerſion, but eſpecially the latter, as it might not be ſo eaſily found on the Moon's dark limb by a teleſcope of a ſmaller field of view). I waited to make this obſervation, but could not ſee the Moon till $14^h\ 22'$, when ſhe emerged from dark ſtill clouds into a moſt clear and ſerene ſky, nothing could be finer for obſervation; and thus ſhe continued during the obſervation, and long after it.

The focus of the teleſcope ſtood as it had ſtood for ſeveral days, and as I had ſeen Venus near the horizon with it two evenings before, and Jupiter with his ſatellites not high above the horizon the preceding morning; and now I had compared it with the fixed ſtars, and the Moon, after emergency from the aforementioned clouds. So the teleſcope was rightly adjuſted.

At $14^h\ 21'\ 3''$, I ſaw a faint point of light, where the emerſion afterwards appeared; but this faint point of light appearing and diſappearing by alternate fits, I could not know if it was part of Saturn or of one of his ſatellites, till it was $14^h\ 21'\ 13''$, when this point of light was grown a little brighter and larger, and therefore I judged it was the tip of the ring juſt emerging. Yet it appeared ſo dull and hazy, that I had

had ſuſpected my teleſcope, if I had not known it to have been rightly adjuſted.

At $14^h$ 22′ 4″, the preceding part of the ring was emerged, and it appeared more bright; and now the body ſeemed emerging or emerged, but ſo very hazy and ill defined, both the body and the ring confuſed together, cloſely on the Moon's dark limb, that I ſhould not have taken it for Saturn, but for a comet emerging from behind the Moon, had I not known otherwiſe from the tables, or ſeen Saturn the preceding mornings.

At $14^h$ 22′ 30″, the preceding end of the ring more plain and bright, the ſubſequent end of the ring more dull; and the body, at this time, appeared a little more diſtinct than before. I continued obſerving to ſee what would follow.

At $14^h$ 22′ 34″, the ſubſequent end of the ring appeared moſt dull, and the preceding end clear; after which, in ſome ſhort ſpace of time, the whole ring and body of Saturn appeared ſharply and well defined.

Wherefore, I conclude, that this diverſity of appearance muſt have ariſen from the effects of an atmoſphere of the Moon.

Chelſea,
19th June, 1762.

Samuel Dunn.

N. B. The latitude of my place is 51° 29′ 5″ N. and 41 ſeconds of time weſt of the Royal Obſervatory at Greenwich.