

XXXIX. *Astronomical Observations made at Cavan, near Strabane, in the County of Donegal, Ireland, by Appointment of the Royal Society, by Mr. Charles Mafon.*

Read November 7, 1770.

Equal Altitudes of the Sun and Stars.

1769 April	Time per Clock of the equal Altitudes of the ☉'s limbs, and of *'s.	Zen. distance or points on the limb of the quadt. the nonius was set at.	☉'s Limb, and Stars observed.	Time per Clock when the ☉'s cent. and * passed the merid. from the mean of the Observations.
D — 3	h ' "			
	7 51 11½	1st wire	} 64 56 Arcturus	
	54 45	middle wire		
	58 15—	3d or last wire		
	7 30 7	}	59 20 Ditto.	
	33 41+			
	37 14—			
	9 20 14	}	72 40 Spica	
	25 36			
	31 1½			
δ — 4	7 47 46	}	64 56 Arcturus	
	51 19			
	54 49+			
	8 26 43	}	Ditto	
	30 17½			
	33 49½			
	h ' "			
	9 16 49	2 41 59	} 72 40 Spica	
	22 11			
	27 37+	31 11½		11 59 23,3
	9 43 35+	2 15 10	} 70 15 Ditto	
	49 49	8 56+		
	56 11	2 35		

Equal Altitudes of the Sun and Stars.

1769 April	Time per Clock of the equal Altitudes of the ☉'s limbs, and of *'s.	Zen. distance or points on the limb of the quad. the nonius was set at.	☉'s Limb, and Stars observed.	Time per Clock when the ☉'s cent. and * passed the Merid. from the mean of the Observations.																																															
8—5	<table><tr><td>h / "</td><td>h / "</td></tr><tr><td>8 23 16½</td><td rowspan="3">}</td></tr><tr><td>26 50</td></tr><tr><td>30 21½</td></tr><tr><td>9 13 23</td><td>2 38 30</td><td rowspan="3">}</td><td rowspan="3">59 20 Arcturus.</td><td rowspan="3"></td></tr><tr><td>18 47</td><td>33 7</td></tr><tr><td>24 11—</td><td>27 41</td></tr><tr><td>9 40 8+</td><td>2 11 44+</td><td rowspan="3">}</td><td rowspan="3">72 40 Spica</td><td rowspan="3"></td></tr><tr><td>46 23½</td><td>5 30+</td></tr><tr><td>52 44—</td><td>1 59 9</td></tr><tr><td></td><td></td><td></td><td>70 15 Ditto</td><td>11 55 56,5</td></tr></table>	h / "	h / "	8 23 16½	}	26 50	30 21½	9 13 23	2 38 30	}	59 20 Arcturus.		18 47	33 7	24 11—	27 41	9 40 8+	2 11 44+	}	72 40 Spica		46 23½	5 30+	52 44—	1 59 9				70 15 Ditto	11 55 56,5																					
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8—8	9 36 6½ middle wire	70 15	Spica																																																
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# Equal Altitudes of the Sun and Stars.

April 1769	Time per Clock of the equal Altitude of the ☉'s Limbs, and of *'s.		Zen. distance or points on the limb of the quadr. the nonius was set at.	☉'s Limb, and Stars observed.	Time of Clock when the ☉'s cent. and * passed the merid. from the mean of the Observations.
	h / "	h / "	° /		
8—12	8 49 25+ 54 46 9 0 13—	Cloudy at the time corre- sponding	72 40	Spica	
24—20	7 47 1 50 50½ 54 33½	3 47 46 43 59 40 16—	62 36	☉'s upp. limb.	
	8 6 27½ 10 17½ 14 11	3 28 24 24 29 20 38½	60 00	Ditto	
	8 <sup>a</sup> 31 58½ 36 6 40 9— 44 32½	3 2 48½ 3 58 44 54 38½ 2 50 19	56 42	Ditto	
	7 35 23 38 56	}	59 20	☉'s lower limb Arcturus	
8—21	7 28 23 31 58+ 35 30	}	59 20	Arcturus	11 1 3.4
	7 7 59 31 8 4 22½	2 7 28:: 2 35 1 57 43½	75 5	Spica	
	8 18 28½ 23 52 29 18—	1 43 39— 1 38 16	72 40	Ditto	
12—22	8 45 48 49 48 53 44:	}	48 12	Arcturus	
	10 2 37 8 7— 13 44	}	39 25	Ditto	

Equal Altitudes of the Sun and Stars.

1769 April	Time per Clock of the equal Altitudes of the ☉'s limb, and of *'s.		Zen. distance of points on the limb of the quadr. the nonius was set at.	☉'s limb, and Stars observed.	Time per Clock when the ☉'s cent. and * passed the merid. from the mean of the Observations.
♂ — 25	h / "	h / "	o /		
	8 35 33 :: 39 27 43 25	}	48 12	Arcturus	
	8 52 53 57 2 9 1 11	}	46 00	Ditto	
	9 52 17 57 48 10 3 25	}	39 25	Ditto	
♀ — 26	8 49 29 + 53 39 57 47½	2 22 11 18 1½ 13 53	46 00	Arcturus	
	9 48 57 54 28 10 0 5	}	39 25	Ditto	11 35 50,2
♀ — 28	8 8 46 47 50 52 ::	}	46 00	Arcturus	
	9 7 51 12 26 16 59	1 50 4 45 29 40 55	43 00	Ditto	11 28 57,3
	9 42 5 47 35 53 12	}	39 25	Ditto	
♂ — 30	12 5 9 10 11 15 19	}	40 51	Arcturus	
	12 23 11½ 28 52½ 34 40 ::	}	39 5	Ditto	

N.B. This day I  
screwed the bob  
of the pendulum  
7 revolutions and  
17 divisions (of  
the nut) and set  
the clock at noon  
to nearly fiducial  
time.

Equal Altitudes of the Sun and Stars.

1760 May	Time per Clock of the equal Altitude of the ☉'s limb, and of *'s.			Zen. distance of points on the limb of the quadr. the nonius was set at.	☉'s limb, and Stars observed.	Time per Clock when the ☉'s cent. and * passed the merid. from the mean of the Observations.		
	h	'	"	h	'	"		
1 — 1	12							
	12	9	50½	}	40 51	Arcturus		
		14	57					
2 — 2	12	4	26	}	40 51	Arcturus		
		9	28					
		14	32 ::	}	39 5	Ditto		
	12	28	9+					
		33	57					
3 — 3	12	4	4	16 7 14	}	40 51	Arcturus	
		9	5½	16 2 11+				
		14	11	15 57 5½	}	39 5	Arcturus	
	12	27	46	15 43 32				14 5 38,9
		33	36	37 43½				
4 — 6	12	2	55+	}	40 51	Arcturus		
		7	58					
		13	3½	}	39 5	Ditto		
	12	20	58					
		26	38					
		32	27—					
5 — 10	12	39	28½	Cloudy at the	}	39 5	Arcturus	
		25	9	time corre-				
		30	58	sponding				
6 — 15	12	17	40	Clouds	}	39 5	Arcturus	
		23	19	Clouds				14 1 12,0
		29	9	15 33 15				
7 — 18	11	58	30	16 1 40	}	40 51	Arcturus	
	12	3	31	15 56 41 :				14 0 5,0
		8	37+					
8 — 24	1	2	58	6 54. 38—	}	46 24	☉'s upp. limb	
		7	3	50 33+				
		11	4½	Clouds				

14 5 38,9

14 1 12,0

14 0 5,0

## Equal Altitudes of the Sun and Stars.

1766 May	Time per Clock of the equal Altitudes of the ☉'s limb, and of *'s.	Zen. distance of points on the limb of the quadt. the nonius was set at.	☉'s limb, and Stars observed.	Time per Clock when the ☉'s cent. and * passed the merid. from the mean of the Observations.
	h ' "	h ' "	° '	
8-24	1 21 4 25 23½ 29 40 1 34 16½	Clouds 6 32 10½ 6 27 55 6 23 19½	} 44 10 ☉'s upp. limb ☉'s low. limb	3 58 39,2
8-31	0 4 30 8 7 11 39 15 22½ 12 45 40	8 44 40 41 4 37 30 33 48½ The ☉'s last limb set over a hill, at the distance of about 3½ or 4 miles.	} 56 58 ☉'s upp. limb ☉'s low. limb	4 24 27,0
	14 46 10— 49 44 53 14+	} } Cloudy	38 17 4 28 Ditto	
	15 12 47 16 24— 19 56	} Cloudy	4 28 Ditto	
	15 36 15+ 39 51: 43 19½ 49 8½ 52 42 56 11	Clouds 19 42 45 39 16 19 33 27 29 53 26 23	} 18 20 Draconis a * 2d mag. merid. z. d. 3 19 38 :: } 16 29 Ditto	17 41 17,5
June 24-1	0 14 38 18 14½ 21 47 25 30 0 30 10 33 49½: 37 27½ 41 14	} Cloudy at the times correspond- ing t tefe.	} 55 57 ☉'s upp. limb Ditto low. limb } 53 45 ☉'s upp. limb Ditto low. limb	

# Equal Altitudes of the Sun and Stars.

1769 June	Time per Clock of the equal Altitudes of the ☉'s limb, and of *'s.		Zen. distance of points on the limb of the quad. the nonius was set at.	☉'s limb, and Stars observed.	Time per Clock when the ☉'s cent. and * passed the merid. from the mean of the Observations.
24 — 1	h	' "	o	}	
	1	6 31½			
		10 20			
		14 8 :			
		18 5			
		21 12½			
		25 9			
		29 2½			
		33 10½			
		Cloudy at the time- correspond- ing to these			
	2	4 53½			
		9 25			
25 — 2		13 56—	}	}	
		18 41			
		Cloudy with rain at night.			
26 — 3	23	28 24	}	}	
		31 58½			
		35 30			
		Clouds			
	23	39 11			
		Clouds			
	23	55 11			
		58 45+			
	o	2 16½			
	o	6 0			
	o	16 40 :			
		20 15			
27 — 4		23 50	}	}	
		Clouds			
		27 33½			
		Clouds			
		38 38½			
		Clouds			
		42 19			
		Clouds			
		49 44			

# Equal Altitudes of the Sun and Stars.

1769 June	Time per Clock of the equal Altitudes of the ☉'s limb, and of *'s.		Zen. distance of points on the limb of the quadt. the nonius was set at.	☉'s limb, and Stars observed.	Time per Clock when the ☉'s cent. and * passed the merid. from the mean of the Observations.
8 — 2	h / "	h / "	o /		
	1 0 0	Cloudy			
	1st wireclou.	8 1 58½	} 49 45	☉'s upp. limb	
	1 5 48½	7 58 11			
	9 31	5 54 27			
	13 28			☉'s low. limb	
	Clo. 1st wire		} 47 00	☉'s upp. limb	
	1 26 30				
	30 25 ::				
	1 56 28		42 43	☉'s upp. limb	
	Clouds	Cloudy at the times correspond- ing to these	} 40 13	☉'s upp. limb	
	2 17 56½				
	22 37			☉'s low. limb	
	27 18				
	32 17½				
	12 54 30 ::	The ☉'s last limb set.			
	Cloudy all night.				
	20 25	Cloudy with rain.			
h — 3	o 16 47	8 54 43	} 56 30	☉'s upp. limb	
	20 23	Clouds			
	23 57 :	8 47 35 ::			
	Then cloudy				
	o 31 27½	Clouds	} 54 25	☉'s upp. limb	
	35 6	Clouds			
	38 40½	8 32 51 :		☉'s low. limb	
	42 27	Clouds			
	o 46 50½	Clouds	} 52 16	☉'s upp. limb	
	Clouds	Clouds			
	54 10—	8 17 18½			

Equal Altitudes of the Sun and Stars.

1769 June	Time per Clock of the equal Altitudes of the ☉'s limb, and of *'s.	Zen. distance of points on the limb of the quadr. the nonius was set at.	☉'s limb, and Stars observed.	Time per Clock when the ☉'s cent. and * passed the merid. from the mean of the Observations.
b — 3	<div>h / ' "</div> <div>☉ 54 19 Clouds</div> <div>57 58½ Clouds</div> <div>1 4 43</div> <div>8 28</div> <div>12 11½</div> <div>16 5+</div> <div>1 22 2 Clouds</div> <div>Clouds Clouds</div> <div>Clouds 7 41 43</div> <div>1 33 47 7 37 40</div> <div>Clouds } So hazy that I</div> <div>Clouds } could not see</div> <div>1 50 46 } the ☉'s limb at</div> <div>55 00 } time correspon.</div> <div>7 16 25 :</div> <div>2 0 2 : Clouds</div> <div>Clouds 7 9</div> <div>Clouds 7 2 54½</div> <div>3 1 00 Clouds</div> <div>6 55 6 4 25</div> <div>13 4 Clouds</div> <div>Then cloudy</div>	<div>o / ' "</div> <div>☉'s low. middle wire</div> <div>Ditto last wire</div> <div>} 49 48 ☉'s upp. limb</div> <div>Low. limb last wire</div> <div>} 47 28 ☉'s upp. limb</div> <div>☉'s low. limb</div> <div>} 44 47 ☉'s upp. limb</div> <div>☉'s low. limb</div> <div>} 42 38 ☉'s upp. limb</div> <div>.36 9 ☉'s upp. limb</div>	4 35 37,8	

Though the air at external contact was not quite so clear as at some times I have seen, yet the sun's limb appeared well defined, and the spots in the disk very strong, their edges keen and distinct. At the internal contact, the air was much changed, and the limb of Venus seemed to cohere to the Sun's limb, by a protuberance that appeared like a dark shade: which seemed to prevent my seeing the thread of light for about 40" longer than I expected.

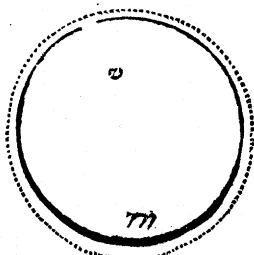
1769 June	Time per Clock of the equal Altitudes of the ☉'s limb, and of *'s.	Zen. distance of points of the limb of the quadr. the nonius was set at.	☉'s limb, and Stars observed.	Time per Clock when the ☉'s cent. and * passed the merid. from the mean of the Observations.
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h — 3

h ' " | h ' " | o ' |

### Equal Altitudes of the Sun and Stars.

When the planet was upon the ☉'s disk, there appeared a faint light shade (having a gentle fluctuating motion) round its periphery, and widest on that part farthest on the Sun's disk: it appeared as per fig. the black circle representing the periphery of Venus, and the dotted one that of the shade, which was very regular and well defined; *v* the upper, and *m* the lower part of the planet: and the whole shade was apparently of equal brightness.



14 45 2½  
48 38  
52 13: }

38 17 α Lyræ

15 11 39+  
15 16½  
18 48+ }

34 28 Ditto

22 15  
40  
49 28  
49 35

Cloudy with rain  
Cloudy  
The eclipse of the sun began  
Very plain

52

Cloudy with rain:

23 28

The clouds began to break; and from this time to 23<sup>h</sup> 54' I endeavoured with a micrometer (of Mr. Dollond's construction) to get measurements for determining the digits eclipsed; but was so interrupted by flying clouds, that nothing could be done with certainty; then cloudy with rain till the end of the eclipse was past.

☉ — 4 Cloudy

☾ — 5 14 44 19  
47 51: :  
51 23 }

38 17 α Lyræ

## Equal Altitudes of the Sun and Stars.

1769 June	Time per Clock of the equal Altitudes of the ☉'s limb, and of *'s.	Zen. distance of points of the limb of the quadr. the nonius was set at.	☉'s limb, and Stars observed.	Time per Clock when the ☉'s cent. and * passed the merid. from the mean of the Observations.
	h / ''	h / ''	° /	
D — 5	15 10 56 14 31½ 18 5	}	34 28	α Lyræ
8 — 7	14 43 32½ 47 6 50 36	}	38 17	α Lyræ
☉ — 11	14 42 4 45 37+ 49 8	}	38 17	α Lyræ
h — 15	Wound up the clock			
8 — 21	14 41 54 45 25—	}	38 17	α Lyræ
☉ — 25	16 25 45 29 59 34 15	} Cloudy at the time corre- sponding to these	} 23 22	α Lyræ
8 — 30	2 30 23 34 5— 37 43½  41 31  2 45 29 49 14 Clouds	Clouds Clouds 9 57 7 ::   9 49 24 9 45 38— Clouds	} 51 23   }	☉'s upp. limb   ☉'s low. limb  ☉'s upp. limb
	14 49 35½ — — — 16 14 3— 18 5 16 23 53 28 8 32 24—	☉'s last limb set  Cloudy at the time correspon- ding	}  } 25 6 } 23 22	  α Lyræ Ditto
				6 17 28,9

6 17 28,9

Equal Altitudes of the Sun and Stars.

1769 July	Time per Clock of the equal Altitudes of the ☉'s limb, and of *'s.	Zen. distance or points of the limbs of the quadr. the monius was set at.	☉'s limb, and Stars observed.	Time per Clock when the ☉'s cent. and *'s pas- sed the merid. from the mean of the Observations.
5 — 1	<div>h ' "</div> <div>3 25 22½</div> <div>3 29 22</div> <div>Clouds</div> <div>30 40 17</div> <div>Clouds</div> <div>48 37</div> <div>16 9 39½</div> <div>Clouds</div> <div>Clouds</div>	<div>h ' "</div> <div>9 17 1</div> <div>13 0 :</div> <div>Clouds</div> <div>Clouds</div> <div>8 57 51</div> <div>Clouds</div>	<div>° '</div> <div>44 33</div> <div>42 40</div> <div>25 6 α Lyræ</div>	<div>☉'s upp. limb</div> <div>Ditto</div>
3 — 3	<div>16 8 53</div> <div>12 54½</div> <div>16 55</div> <div>22 45—</div> <div>27 0—</div> <div>31 14½</div>	<div>Cloudy. at the time cor- responding.</div>	<div>25 6 α Lyræ</div> <div>23 22 Ditto</div>	
24 — 6	<div>2 12 20</div> <div>15 56</div> <div>19 29</div> <div>23 10+</div> <div>26 51</div> <div>30 29½</div> <div>34 3½</div> <div>37 46</div>	<div>11 7 21+</div> <div>3 44½</div> <div>0 13+</div> <div>10 56 31½</div> <div>10 52 49 ::</div> <div>49 13</div> <div>45 39+</div> <div>41 55½</div>	<div>57 30</div> <div>55 26</div> <div>☉'s upp. limb</div> <div>☉'s low. limb</div> <div>☉'s upp. limb</div> <div>☉'s low. limb</div>	<div>6 39 56,8</div>
8 — 7	<div>16 11 24</div> <div>15 24</div> <div>16 21 15—</div> <div>25 29</div> <div>29 45</div>		<div>25 6 α Lyræ</div> <div>23 22 Ditto</div>	

Equal Altitudes of the Sun and Stars.

1769 July	Time per Clock of the equal Altitudes of the ☉'s limb, and of *'s.		Zen. distance or points on the limb of the quad. the nonius was set at.	☉'s limb, and Stars observed.	Time per Clock when the ☉'s cent. and *'s pas- sed the merid. from the mean of the Observations.
	h ' "	h ' "	o ' "		
☉—16	Wound up the Clock				
☉—17	4 44 15 48 34 52 54  57 27½  5 1 56 6 32— Clouds	Clouds 9 52 17— 47 59  43 24½  9 38 55 34 14 : Clouds	} 43 45  } 41 12	☉'s upp. limb ☉'s low. limb  ☉'s upp. limb ☉'s low. limb	   7 20 33,5 high wind
♀—21	16 2 4 6 6 10 6½  16 15 56½ 20 11 24 26½	}  }	25 6  23 22	α Lyrae  Ditto	
♂—22	3 41 45½ 45 27 49 4 49 15 52 54½  3 56 48½ 4 0 35 Clouds  4 16 47½ 4 20 47 24 37 +  16 1 42½ 5 43½ 9 44—	11 35 12 + 31 32— 27 53 27 42 11 24 4  11 20 9½ 16 25 12 42 ::  11 0 11½ 10 56 23½ 10 52 23  }	} 55 6  } 53 1	☉'s upp. limb  ☉'s low. limb middle wire Ditto 3 <sup>d</sup> or last wire  ☉'s upp. limb  ☉'s upp. limb ☉'s low. limb Ditto  α Lyrae	      7 38 40,2

Equal Altitudes of the Sun and Stars.

1769 July	Time per Clock of the equal Altitudes of the ☉'s limb, and of *'s.		Zen. distance or points on the limb of the quad. the nonius was set at.	☉'s limb, and Stars observed.	Time per Clock when the ☉'s cent. and *'s pas- sed the merid. from the mean of the Observations.
	h / "	h / "	• /		
12 — 22	16 15 33½ 19 49— 24 4	}	23 22	α Lyræ	
8 — 25	16 0 33 4 35½ 8 35½  14 25 18 40 22 25	}	25 6  23 22	α Lyræ  Ditto	
12 — 29	15 59 4 16 3 3½:: 7 5	}	25 6	α Lyræ	
	Then cloudy				
August ☉ — 6	4 2 35+ 6 13½ 9 46+ 9 57 13 33  4 18 36 22 17 25 54  29 42+	12 59 58½ 56 21 52 46+ 52 36 12 49 1  12 43 58+ Clouds 12 36 42  12 32 53	}	62 30 ☉'s upp. limb  ☉'s low. limb Ditto  60 15 ☉'s upp. limb  ☉'s low. limb	8 31 34.0  Very high winds
☾ — 7	Clouds Clouds 16 17 59	}	23 22	α Lyræ	
8 — 9	16 17 15+	}	23 22	α Lyræ	

Equal Altitudes of the Sun and Stars.

1769 April	Time per Clock of the equal Altitudes of the ☉ limb, and of *'s.	Zen. distance or points on the limb of the quad. the horiz. was set at.	☉'s Limb, and Stars observed.	Time per Clock when the ☉'s cent. and *'s pas- sed the merid. from the mean of the Observations.
8-9	<div> <div>h m s</div> <div>17 25 24½</div> <div>29 00</div> <div>32 32</div> </div> <div>}</div> <div> <div>h m s</div> <div>37 43½</div> <div>41 21</div> <div>44 56</div> </div> <div>}</div>		<div>25 45 α Cygni</div> <div>24 00 Ditto</div>	
8-16	<div> <div>h m s</div> <div>17 22 49</div> <div>26 25</div> <div>29 57</div> </div> <div>}</div> <div> <div>h m s</div> <div>17 35 7½</div> <div>38 44½</div> <div>42 20+</div> </div> <div>}</div>		<div>25 45 α Cygni</div> <div>24 00 Ditto</div>	
12-17	<div> <div>h m s</div> <div>17 51 17</div> <div>54 58½</div> <div>58 38</div> </div> <div>}</div> <div> <div>h m s</div> <div>21 57 23</div> <div>53 41½</div> <div>50 2½</div> </div> <div>}</div> <div> <div>h m s</div> <div>18 4 23</div> <div>8 9½</div> <div>11 55</div> </div> <div>}</div>		<div>21 41 α Cygni</div> <div>19 53 Ditto</div>	19 54 20,0
18-21	<div> <div>h m s</div> <div>17 49 47</div> <div>53 28</div> <div>57 8</div> </div> <div>}</div> <div> <div>h m s</div> <div>18 2 54</div> <div>6 39</div> <div>10 24</div> </div> <div>}</div>	Cloudy at the time cor- responding.	<div>21 41 α Cygni</div> <div>19 53 Ditto</div>	
24-24	<div> <div>h m s</div> <div>17 19 47½</div> <div>23 22½</div> <div>26 25</div> </div> <div>}</div> <div> <div>h m s</div> <div>18 5 30</div> <div>9 17½</div> </div> <div>}</div>	Cloudy at the time cor- responding.	<div>25 45 α Cygni</div> <div>19 53 Ditto</div>	

# Equal Altitudes of the Sun and Stars.

1769 August	Time per Clock of the equal Altitudes of the ☉'s limb, and of *'s.	Zen. distance or points on the limb of the quadr. the nonius was set at.	☉'s limb, and Stars observed.	Time per Clock when the ☉'s cent. and *'s pas- sed the merid. from the mean of the Observations.
☉—27	h / '' Clouds 17 22 15½ Clouds 17 34 36 38 11— 23 30	h / '' } } Saw a Comet near	o / 25 45 α Cygni 24 00 Ditto	
Sept. ♀ — 1	Saw the aforementioned Comet through a thick haze; it was moved to the eastward.			
24—7	h / '' Clouds Clouds 17 21 40 17 26 52 Clouds 34 2½	h / '' } } } Rain in the night	o / 25 45 α Cygni 24 00 Ditto	
☉—10	Cloudy with rain till about half past 4 in the morning, when the clouds broke in the east, and I saw the Comet a little to the south of Procyon; its tail extended nearly to the belt of Orion, and made a splendid appearance. Cloudy and rain in 8' after.			
♂—11	Wound up the clock			
♀—15	h / '' 17 23 53+ 27 32— 31 6 17 40 25:: 44 8 Clouds 19 54 59½ 58 46— 2 32—	h / '' 22 3 3+ 21 59 26— 21 55 50½ — — — 21 42 50 — — — 21 31 58+ 21 28 10+	o / 24 00 α Lyrae 21 41 Ditto 19 41 Ditto	19 43 28,5

Equal Altitudes of the Sun and Stars.

1769 Sept.	Time per Clock of the equal Altitudes of the ☉'s limb, and of *'s.	Zen. distance or points on the limb of the quad, the nonius was set at.	☉'s limb, and Stars observed.	Time per Clock when the ☉'s cent. and *'s pas- sed the merid. from the mean of the Observations.
18	17 22 46 26 24 + 29 59	}	24 00 α Cygni	
20	17 53 5 $\frac{1}{2}$ 56 53 $\frac{1}{2}$ 18 0 39	}	19 41 α Cygni	
	Clouds 18 9 37 $\frac{1}{2}$ Clouds	}	18 00 Ditto	
21	8 10 33 15 20 $\frac{1}{2}$ 20 9: 20 26 25 21	13 54 51 50 4 $\frac{1}{2}$ 45 16 44 59 40 6 $\frac{1}{2}$	} 63 48 ☉'s upp. limb  ☉'s low. limb Ditto	11 3 5.6
	8 32 44: 38 8 43 27 43 46 49 15	13 32 36 Clouds Clouds Clouds	} 61 30 ☉'s upp. limb  ☉'s low. limb	
	17 52 43 56 33 $\frac{1}{2}$ 18 0 17 $\frac{1}{2}$	}	} 19 41 α Cygni the * fluttered	
	18 5 20 $\frac{1}{2}$ 9 15 $\frac{1}{2}$ 13 10	}	} 18 00 Ditto.	
29	9 9 9 14 54 20 45	13 47 59 Clouds Clouds	} 63 24 ☉'s upp. limb Very thick and hazy	
3	Clouds 18 6 15 19 10	} Cloudy at the time correspond- ing to these	} 18 00 α Cygni	

# Equal Altitudes of the Sun and Stars.

1769 Sept.	Time per Clock of the equal Altitudes of the ☉'s limb, and of *'s.		Zen. distance or points on the limb of the quadt. the nonius was set at.	☉'s limb, and Stars observed.	Time per Clock when the ☉'s cent. and *'s pas- sed the merid. from the mean of the Observations.
	h / "	h / "	o /		
8-29	8 15 24 19 28	Cloudy at the time cor- responding to these	16 50	Ditto	
	18 26 14½ 30 39 35 3½				
	18 53 8 57 52 19 4 1		15 00		
		20 18 39 Cloudy	12 14		19 38 15.5
8-30	8 40 12 45 10 50 5 50 24 55 27	14 23 27½ 18 34 13 37 14 13 17½ 8 16	66 55	☉'s upp. limb	
				☉'s low. limb Ditto	
	9 3 34 9 3 14 32	14 0 8 13 54 40 49 4	64 35	☉'s upp. limb	11 32 14.4
	9 9 18 14 55 20 41	13 54 25 13 48 43 43 2:		Ditto low. limb	
	18 19 7	20 56 39	16 50	α Cygni	
	18 25 52½ 30 14 34 41	20 49 53+ 45 30 41 5	15 00	Ditto	19 37 52.7
8 Oct 4	9 18 33 24 12 29 53	14 11 15½ — — — 13 59 58	65 50	☉'s upp. limb	
	24 29 30 16 36 7	— — — 59 32 53 37 ::		☉'s low. limb.	

## Equal Altitudes of the Sun and Stars.

1769 October	Time per Clock of the equal Altitudes of the ☉'s Limbs, and of *'s.		Zen. distance or points on the limb of the quadr. the nonius was set at.	☉'s limb, and Stars observed.	Time per Clock when the ☉'s cent. and *'s pas- sed the merid. from the mean of the Observations.
	h    "	h    "	°    '		
8 — 4	9 44 35	13 45 15	63 36	☉'s upp. limb	
24 — 5	18 24 1— 28 24 32 49	20 48 2 43 39 39 12	} 15 00	α Cygni	19 36 1,3
	18 49 52 55 39	20 22 10½ 20 16 25		Ditto	
8 — 10	9 44 48 50 48 56 50	14 24 28: 14 18 30 Clouds	} 67 23	☉'s upp. limb	12 5 1,6
	9 51 5 57 16 10 3 33	} 14 5 42		☉'s lower limb	
24 — 12	9 20 33 25 40— 30 49	15 2 3 14 56 53 51 47	} 71 00	☉'s upp. limb.	12 11 41,0
	25 55 31 10 36 26	14 56 36 51 25 46 8		Ditto low. limb	
20 — 23	9 23 7— 27 46 32 25	} Cloudy at the time cor- responding	} 68 16	☉'s upp. limb	
	9 28 11 32 45 37 26½			Ditto low. limb	
	9 45 16 50 18 55 20	15 51 45 46 40 41 37½	} 75 54	☉'s upp. limb	12 48 52,1
	9 50 35 55 42 10 0 50	46 24 41 16 36 9		Ditto low. limb	

Apparent Zenith Distances of the ☉, ♃, and ☆'s.

		☉, ♃, or ☆'s observed.	Apparent zen. distance on the meridian.	Barom.	Ther.
1769			° ' "		
April					
♃ —	10	Spica	64 45 24		
	20	☉'s upper limb	42 51 00	29 69	52
		Ditto lower limb	43 22 40		
22		Spica	64 45 32		
		Arcturus	34 26 20		
		♃'s center	71 21 36		
		♃'s lower limb	77 30 36 :	29 52	42
		Antares	80 38 40		
25		Spica	64 45 16 :	20 93	46
26		Spica	64 46 6		
		Arcturus	34 27 00	29 85	52
28		Arcturus	34 27 8 :	29 92	49
29		Ditto	34 27 00	30 10	52
30		☉'s upper limb	39 37 40	29 97	60
		Ditto lower limb	40 9 16 :		
		Spica	64 46 00		
May 1		☉'s upper limb	39 19 24	31 00	62
		Ditto lower limb	39 51 16		
2		☉'s lower limb	39 33 26	30 20	59
3		Spica	64 46 00		
		Arcturus	34 26 52	30 05	55
		Antares	80 39 12		
4		☉'s upper limb	38 26 16	30 00	56
6		Spica	64 45 50	30 12	48
		Arcturus	34 26 52		
7		☉'s upper limb	37 36 00	29 94	59
		Ditto lower limb	38 7 56		
		Spica	64 45 50		
		Arcturus	34 26 48	29 87	47
		Jupiter's center	70 52 24		

## Apparent Zenith Distances of the ☉, ☿, and \*'s.

		☉, ☿, or *'s observed.	Apparent zen. distance on the meridian.	Barom.	Ther.	
1769						
May	10	Spica	64 45 46			
		Arcturus	34 26 48	29 86	43	} In observing the ☉'s zen. dist. I set the ☉'s limb just (or scarcely) to touch the wire; which is the reason why the ☉'s diameter is in this observation so much greater then made before.
	12	☉'s upper limb	36 17 16	29 60	54	
		Ditto lower limb	36 49 48			
		Spica	64 46 00			
1/2	13	☉'s upper limb	36 2 42	29 52	58	} Observed without the dark glass; it being a very thick fog.
		Ditto lower limb	36 34 30			
	14	☉'s upper limb	35 48 28	29 55	57	
		Ditto lower limb	36 20 2	29 63	49	
		☿'s upper limb	55 50 56	29 69	44	
		Spica	64 45 55			
		Arcturus	34 26 52	29 69	44	
	15	☿'s upper limb	60 54 40	29 69	44	
		Spica	64 46 00			
	18	☉'s upper limb	34 53 40			
		Ditto lower limb	35 25 12	29 54	51	
		Spica	64 46 00			
		☿'s upper limb	73 30 32			
		☿'s cent.	70 30 20	29 64	37	
	23	☉'s upper limb	33 53 00	29 22	59	
		Ditto lower limb	34 24 32	29 34	55	
		Arcturus	34 26 52	29 41	64	
	24	☉'s upper limb	33 41 48			
		Ditto lower limb	34 13 38			
June	11	☉'s upper limb	31 25 40	29 41	53 1/2	
	12	Ditto	31 22 00	29 66	55	
		Arcturus	34 26 44			
	14	☿'s upper limb	72 27 14	29 36	55	
	15	☉'s upper limb	31 13 00	29 46	58	
	17	Antares	80 39 12			
		☿'s upper limb	78 44 48	29 35	47	
	18	☉'s upper limb	31 7 54	29 41	54	
		Ditto lower limb	31 39 42			

Apparent Zenith Distances of the ☉, ♀, and \*'s.

		☉, ♀, or * observed.	Apparent zen. distance on the meridian.	Barom.	Ther.
1769			h ' "		
June	23	☉'s upper limb	31 7 20	29 17	60
		Ditto lower limb	31 39 12		
	26	☉'s upper limb	31 12 6	29 38	5
		Ditto lower limb	31 43 56		
	30	☉'s upper limb	31 24 6	29 71	60
July	1	☉'s upper limb	31 28 00	29 62	62
	5	☉'s upper limb	31 48 00	29 72	67
		Ditto lower limb	32 19 56		
	6	Antares	80 39 20	29 75	57
	9	☉'s upper limb	32 14 46	29 57	63
	13	♀'s upper limb	76 58 16	29 34	57
	14	☉'s upper limb	32 56 12	29 49	59
		♀'s upper limb	78 27 10	29 66	56
	17	☉'s upper limb	33 25 28	29 12	59
		Ditto lower limb	33 57 26		
August	22	Ditto	34 53 24	29 49	63
	2	☉'s upper limb	36 54 30	29 50	62
	17	♄ Aquilæ	46 33 12	29 69	54
		♀'s upper limb	61 39 20	29 70	51
	19	☉'s upper limb	41 56 20	29 40	57
		Ditto lower limb	42 27 56		

To find the Error of the Line of Collimation of the Quadrant.

1769  
April  
2-22

I set up a board at the distance of about 300 yards, painted black, with two white marks on it; the diameter of each white mark =  $3\frac{1}{2}$  inches, and the distance of their centers  $11\frac{1}{2}$  inches = the difference of the height of the center of the telescope, when the quadrant is inverted, and made the following observations.

Zen. dist. of the upp. mark.		
o	1	
89	50 00	} The quadrant in its proper position.
	50 6	
	4	
	6	
	0	
	4	
	0	
Mean	89 50 3	
Zen. dist. of the low. mark.		
o	1	
90	7 20	} The quadrant inverted.
	7 20	
	18	
	14	
	16	
	20	
	20	
Mean	90 7 18,3	
	89 50 3	
	179 57 21,3	
	180 0 0	
	2 38,7	
$\frac{1}{2}$	1 19,3	To be added to the observed zenith distance.

2-26  
28

I took the telescope off the quadrant, and adjusted the line of collimation something nearer. I found the error of the line of collimation of the quadr. in the same manner, as on the 22d, thus:

Zen. dist. of the upper mark.		
o	1	
89	51 00	} Quadr. in its proper position.
	51 00	
	51 00	
	51 00	
	50 56	
	51 4	
	51 6	
	51 6	
	51 0	
	51 6	
Mean	89 51 2-	
Zen. dist. of the low. mark.		
o	1	
90	7 20	} Quadrant inverted.
	7 12	
	24	
	20	
	22	
	20	
	18	
	16	
	18	
	20	
	12	
Mean	90 7 18,4	
	89 51 2--	
	179 58 20,1	
	180 00 00	
	2 39,9	
$\frac{1}{2}$	0 50	To be added to the observed zen. distance.

N.B. This method is given us by the Rev. Mr. Nevil Maskelyne, Astronomer Royal, in his description of Mr. Bird's astronomical quadr. published with his instructions for the observation of the late Transit of Venus, at the end of the Nautical Almanac of 1769, see p. 23, and may be followed with great accuracy; and to avoid the error that may fall on any two divisions of the quadr. as many different divisions may be taken as the observer pleases, by the shifting the board that has the marks on it, higher or lower.

## For the Latitude of the Observatory at Cayan.

	☉ or *'s observed	App. zenith distances on the merid.	Refra.	☉'s px. in alt. hor. = 8",5	*'s ab. in decl.	*'s snut. in decl.	Error of the line of coll. of the quad.	True zen. distances.	☉ or *'s true decl. at the time of observation.	Latitude from each observation.
1769 April		° ' "	± "	—	"	"	± "	° ' "	° ' "	° ' "
10	Spica	64 45 24	2 0,5		—7,6	—6,3		64 48 29,6	9 57 00,0	54 51 30
20	☉'s center	43 6 50	0 53,1	5,8				43 8 56,3	11 42 55,2	51 51
22	Spica	64 45 32	2 2,4		—7,5	—6,2	1 19+	64 48 39,7	9 57 00,5	51 39
22	Arcturus	34 26 20	0 39,7		—5,9	—5,8		34 28 7,0	20 23 33,8	51 41
	Antares	80 38 40	5 41,0		—2,0	—2,7		80 45 35,3	25 53 56,7	51 39
25	Spica	64 45 16:	2 3,0		—7,5	—6,2		64 48 24,3:	9 57 0,6	51 24:
26	Spica	64 46 6	2 0,8		—7,5	—6,2	± "	64 48 43,1	9 57 0,7	51 42
	Arcturus	34 27 0	0 39,1		—5,3	—5,8		34 28 18,0	20 23 33,6	51 52
28	Ditto	34 27 8	0 39,4		—4,8	—5,8	0 50	34 28 26,8	20 23 33,5	52 00:
29	Ditto	34 27 0	0 39,4		—4,8	—5,8		34 28 18,8	20 23 33,5	51 52
30	☉'s center	39 53 28:	0 47,2	5,4				39 54 59,8:	14 56 48,5	51 48:
	Spica	64 46 00	2 0,5		—7,4	—6,2		64 48 46,9	9 57 00,8	51 46
May										
1	☉'s center	39 35 20	0 47,9	5,4				39 36 52,5	15 14 57,2	51 50
2	☉'s L. L.	39 33 26	0 47,7	5,4				39 34 58,3	15 32 50,9	51 55
3	Spica	64 46 00	2 0,7		—7,2	—6,2		64 48 37,3	9 57 1,0	51 36
	Arcturus	34 26 52	0 39,0		—3,8	—5,7		34 28 11,5	20 23 33,4	51 45
	Antares	80 39 12	5 36,0		—2,6	—2,6		80 45 32,8	25 53 57,0	51 36
6	Spica	64 45 50	2 3,1		—7,0	—6,2		64 48 29,9	9 57 1,2	51 29
	Arcturus	34 26 52	0 39,9		—3,2	—5,7		34 28 13,0	20 23 33,2	51 46
7	☉'s center	37 51 58	0 43,5	5,2				37 53 26,3	16 58 21,2	51 48
	Spica	64 45 50	2 2,4		—7,0	—6,1		64 48 29,3	9 57 1,3	51 28
	Arcturus	34 26 48	0 39,7		—3,0	—5,7		34 28 9,0	20 23 33,1	51 42
10	Spica	64 45 46	2 3,5		—6,9	—6,1		64 48 26,5	9 57 1,5	51 25
	Arcturus	34 26 48	0 40,0		—2,3	—5,7		34 28 10,0	20 23 32,9	51 43
12	☉'s center	36 33 32	0 41,6	5,8				36 34 58,5	18 16 48,4	51 47
13	☉'s center	36 18 36	0 48,0	5,0				36 20 1,8	18 31 36,0	51 38
14	☉'s center	36 4 15	0 40,2	5,0				35 5 40,2	18 46 4,5	51 45
	Spica	64 45 55	2 2,5		—6,5	—6,1		64 48 34,9	9 57 1,7	51 33
	Arcturus	34 26 52	0 39,6		—1,5	—5,7		34 28 14,4	20 23 32,7	51 47
18	☉'s center	35 9 26	0 39,8	4,9				35 10 50,9	19 40 46,0	51 37
	Spica	64 46 00	2 4,4		—6,1	—6,1		64 48 42,2	9 57 2,0	51 40
23	☉'s center	34 8 46	0 36,9	4,8				34 10 8,1	20 41 36,8	51 45
	Arcturus	34 26 52	0 38,2		± 0,2	—5,6		34 28 14,8	20 23 32,2	51 47
24	☉'s center	33 57 43	0 36,5	4,7				33 59 4,8	20 52 44,3	51 49
Julie	☉'s U. L.	31 25 40	0 34,0	4,4				31 26 59,6	23 8 38,7	51 26
15	☉'s U. L.	31 13 00	0 33,4	4,4				31 14 19,0	23 21 23,6	51 30

## For the Latitude of the Observatory at Cavan.

	☉ or *'s observed	Ap. zenith distances on the merid.	Refr.	☉'s px. in alt. hor. = 8",5	*'s ab. in decl.	*'s snut. in decl.	Error of the line of coll. of the quad.	True zen. distances.	☉ or *'s true decl. at the time of observation.	Latitude from each observation.
1769		° ' "	+	—	"	"	+	° ' "	° ' "	° ' "
June	17 Antares	80 39 12	5 34,8		—3,9	—2,4	0 50	80 45 30,5	25 53 58,1	51 32
	18 ☉'s center	31 23 48	0 33,9	4,4				31 25 7,5	23 26 37,1	51 45
	23 ☉'s center	31 23 16	0 33,2	4,4				31 24 34,8	23 27 5,6	51 40
	26 ☉'s center	31 28 10	0 33,6	4,4				31 29 20,2	23 22 25,0	51 45
	30 ☉'s U. L.	31 24 6	0 33,8	4,4				31 25 25,4	23 10 26,0	51 38
July	1 ☉'s U. L.	31 28 0	0 33,5	4,4				31 29 19,1	23 6 24,6	51 31
	5 ☉'s center	32 3 58	0 33,7	4,5				32 5 17,2	22 46 20,6	51 38
	6 Antares	80 39 20	5 31,1		—3,8	—2,3		80 45 35,0	25 53 58,6	51 36
	9 ☉'s U. L.	32 14 46	0 34,3	4,5				32 16 5,8	22 19 50,6	51 43
	14 ☉'s U. L.	32 56 12	0 36,0	4,6				32 57 33,4	21 38 17,3	51 38
August	17 ☉'s center	33 41 27	0 36,2	4,7				33 42 48,5	21 8 52,0	51 41
	22 ☉'s L. L.	34 53 24	0 38,4	4,8				34 54 47,6	20 12 42,8	51 42
	2 ☉'s U. L.	36 54 30	0 41,4	5,1				36 55 56,3	17 40 4,4	51 50
	17 α Aquilæ	46 33 12	0 59,5		+7,8	+3,9		46 35 13,2	8 16 25,9	54 51 39
Mean of the whole										51 40,8

N. B. By comparing Mr. Flamsteed's observations with those made by the Rev. Mr. Maskelyne, Astronomer Royal, in the years 1765 and 1766, Arcturus moves annually 2",0144 Southward in declination: therefore 18",6 is subtracted in the above from the declination of Arcturus, as settled from Dr. Bradley's observations for the beginning of the year 1760.

The following are the difference of R. A. between the  $\mathcal{D}$ 's limb and  $\ast$ 's, observed by wires placed in the focus of the eye glass of a reflecting telescope, that magnified 80 times. The telescope was supported by a polar axis placed in the meridian, and on a strong stand, loaded with weight, which made it keep its position very steady.

1769 July		Time per Clock.	Difference of R. A. between the $\mathcal{D}$ 's limbs and $\ast$ 's.	
21	20	$\ast$ passed the vertical wires in the reflector.	$\mathcal{D}$ 's 2d or Eastern limb, passed the same vert. wires	
		h ' "	h ' "	
		19 39 33	- - -	
		39 43	19 43 32 $\frac{1}{2}$	
		47 13	51 13	
		47 24 $\frac{1}{2}$	51 25	
		47 36	51 38	
	20	5 11	20 9 35 $\frac{1}{2}$	
		5 21 $\frac{1}{2}$	9 48	
		5 34	10 00	
		18 13 $\frac{1}{2}$	22 57 $\frac{1}{2}$	
		18 25	23 9	
		18 36	20 +	
		18 48	32	
	20	19 00::	44 $\frac{1}{2}$	
	20	25 17 +	30 12	
		28	33 $\frac{1}{2}$	
		39 +	35	
		51	46	
		26 3	30 59	
		33 54	39 2	
		34 5	39 13	
		34 40	39 48	
		41 37	46 6	
		41 48 $\frac{1}{2}$	47 7 $\frac{1}{2}$	
		Clouds	47 19	
		Cl.	30 $\frac{1}{2}$	
	20	42 23 $\frac{1}{2}$	47 42 $\frac{1}{2}$	

After these, it got so hazy that I could not see the star.

N. B. The  $\ast$  passed along the wire parallel to the equator, or moved in a line parallel to the said wire. At the last observations the  $\ast$  was about 18 or 20' north of the  $\mathcal{D}$ 's center.

Difference

Difference of Right Ascension between the  $\gamma$ 's Limb and  $\ast$ 's.

Time per Clock.			Time per Clock.		
July	$\gamma$ 's 1 limb passed the wires vertical to the equator.	$\ast$ passed the same vertical wires.	July	$\ast$ passed the wires vertical to the equator.	$\gamma$ 's 2d limb passed the same wires.
$\eta$ — 21	h ' "	h ' "	$\eta$ — 21	h ' "	h ' "
18	30 3 $\frac{1}{2}$	18 33 53—	21	51 4	21 53 27 $\frac{1}{2}$
	30 15+	34 3		51 15 $\frac{1}{2}$	53 39+
	39 41+	42 13 $\frac{1}{2}$		51 26	53 50
	39 32	- - -		51 37 $\frac{1}{2}$	54 2
	40 4	42 36—		51 49 $\frac{1}{2}$	54 14
	40 15+	- - -	21	58 39	22 1 14+
	40 27—	42 59		58 50	- - -
18	53 39 $\frac{1}{2}$	18 55 47		59 1	1 36
19	5 7	19 6 58		59 12+	1 48
	18	7 10—		59 24	2 00
	29 $\frac{1}{2}$	7 20+	22	5 50 $\frac{1}{2}$	8 36
	41 $\frac{1}{2}$	7 32		6 1 $\frac{1}{2}$	8 46
	5 53 $\frac{1}{2}$	7 43+		6 12	- - -
	10 47	12 27 $\frac{1}{2}$		6 24	9 10
	10 59	12 38 $\frac{1}{2}$		6 36—	9 21
	11 10+	12 49 $\frac{1}{2}$		13 9	16 18
	11 21 $\frac{1}{2}$	13 1		13 20	16 29 $\frac{1}{2}$
	11 34—	13 12 $\frac{1}{2}$		13 31	16 41—
19	17 00	- - -		13 42	16 53
	12—	18 42—		18 14	21 19+
	23	18 52 $\frac{1}{2}$		18 25	21 30 $\frac{1}{2}$
	35+	19 4		18 36—	21 41 $\frac{1}{2}$
	17 47	19 16		18 47	21 53
	22 42	- - -	22	18 59	22 5+
	22 53 $\frac{1}{2}$	19 24 14		28 12 $\frac{1}{2}$	31 32—
	23 4 $\frac{1}{2}$	- - -		28 23+	31 43+
	23 16	24 36 $\frac{1}{2}$		28 34 $\frac{1}{2}$	31 54 $\frac{1}{2}$
	23 28+	24 48		28 46	32 5
	30 18	- - -		28 57+	32 18
	30 30 $\frac{1}{2}$	31 40		37 11	40 43—
	30 42—	31 50		37 22+	40 54 $\frac{1}{2}$
	30 53 $\frac{1}{2}$	32 1		37 33+	41 4 $\frac{1}{2}$
	31 5 $\frac{1}{2}$	32 14		37 44 $\frac{1}{2}$	41 17
			22	37 56 $\frac{1}{2}$	41 29

N.B. In all these observations the  $\ast$  moved parallel to the equator. At the beginning of the observations the  $\ast$  was North of the  $\gamma$ 's center about 18'.

At 19h.47' when I left off to take the occultation, the  $\ast$  was but little North of the  $\gamma$ 's center; by estimation 3 or 4'.

The differences of A.R. after the occultation are very accurate, the  $\gamma$  being near the meridian, leaving the  $\ast$  nearly in a right line from her center.

Immediately after these, it began to get foggy.

Difference

# Difference of Right Ascension between the $\gamma$ 's Limb and $\ast$ 's.

Time per clock.	
July 2—21	$\gamma$ 's 2d limb passed the wires vertical to the equator. $\ast$ passed the same vertical wires.
19 33 33½	19 34 38
33 45+	34 49
33 56+	35 0½
34 8	35 12—
34 20+	35 24—
41 5+	- - -
41 16½	42 9
41 28	42 20½
41 40—	42 32—
41 52	42 43+
46 11	46 56½
19 46 23+	19 47 8

Left off to take the occultation.

Time per clock.	
1769 August 2—16	$\gamma$ 's 1st limb passed the wires vertical to the equator.      A star of the 5th mag. passed the same vert. wires.
h ' "	h ' "
18 4 30—	- - -
4 43—	- - -
4 55	18 25 1+
5 6	25 12—
5 18—	25 23

Cloudy immediately after.

A bright spot in the  $\gamma$  moved along the directing wire, or wire parallel to the equator, and the  $\ast$  followed about 6' North of  $\gamma$ 's center.

# Difference of Right Ascension between the D's Limb and \*'s.

Time per clock.		
1769 Sepr. 2-15	D's 2d limb passed the wires vertical to the equator.	16 Pices - passed the same verti- cal wires.
	19 45 7—	
	19—	
	31—	} Cloudy
	42½	
	45 54	
	19 54 17½	19 56 50
	30—	56 2—
	42½	13
	53	23+
	55 5	57 34+
		then cloudy
	20 29 16½	20 30 44
	28—	30 56
	40+	31 8—
	51½	31 19
	30 3½	31 30
	34 33+	36 53+
	45+	36 5
	58—	16+
	35 9	27
	35 20½	36 38+
	41 13+	- - -
	25½	42 33
	38—	44+
	48½	55+
	42 0½	43 7—
	46 16+	- - -
	28+	- - -
	40—	20 47 41
	51½	47 52
	47 3½	48 3½
	50 57—	51 49
	51 8	52 0
	51 20½	52 12
	56 39	57 23
	56 50+	57 33½
	57 1½	57 45+

The \* about 18'  
South of the D's  
center.

The \* by esti-  
mation 24' South  
of the D's center.

In these the D's  
center and \*  
nearly at the di-  
stance of the field  
of the telescope,  
or as near the  
ends of the wires  
as the D's limbs  
would admit of.

Note. In all these observations the \* was often tried if it would keep the wire parallel to the equator, after moving it off the wire, and bringing it on again (by means of the vertical screw). For in these observations I was obliged to bring the star more Southward after I had made it keep the wire, before I brought it back for the D; otherwise the D's center would not follow through the field of the telescope; and I always found that it returned again to keep the wire with great accuracy: the wires very seldom wanting any alteration.

Difference of Right Ascension between the  $\delta$ 's Limb and  $\star$ 's.

		Time per Clock.					
Sept.	$\delta$	$\delta$ 's 2d limb passed the wires vertical to the equator.	16 Pices passed the same vertical wires.				
		h / "	h / "				
	15	21 4 14+	26	} The $\star$ would not follow through the field of the telescope.			
		38					
		49					
		5 1					
	20	20 24 34	20 26 13				
		24 47+	26 25 $\frac{1}{2}$				
		24 59 $\frac{1}{2}$	37				
		25 12	26 49				
	20	31 54	20 33 12 $\frac{1}{2}$				
		32 6	24				
		32 18 $\frac{1}{2}$	33 36				
		37 27	38 31				
		37 38 $\frac{1}{2}$	42 $\frac{1}{2}$				
		57 51 $\frac{1}{2}$	38 54+				
	10	42 51	—				
		43 4	43 53				
		17	44 5 $\frac{1}{2}$				
		29	17				
		43 41	44 5+				
	20	50 55	51 23 $\frac{1}{2}$				
		51 7 $\frac{1}{2}$	51 35 $\frac{1}{2}$				
		58 29	58 37				
		58 42	58 50				
		58 56+	59 3				
		59 8	59 14 $\frac{1}{2}$				
	20	59 21	10 59 26				
	21	1 —	the $\star$ 2" after the $\delta$ 's limb.				
	21	2	The $\delta$ 's limb and $\star$ equal in A. R. as near as could be judged.				
	21	3 35	The $\delta$ followed the $\star$ 15" in time.				
	21	7 50	Clouds				
	21	11	Clear				

These may not be so accurate as the above.

The Star was to move along the equatorial wire in all these observations, and I look upon the whole to be very good; particularly those after the occultation, as the difference of declination of the  $\delta$ 's center and Star was by estimation not more than 4 or 5', nor even so much at the last observations.

Difference of Right Ascension between the D's Limb and \*'s.

		Time per Clock.		
Sept.	16 Pifces passed the wires vertical to the equator.	D's 2d limb passed the same wires.		
		h	'	"
20	23 15 41+	23	21	12+
	41+			33
	16 +	21	46	—
	48 4	54	58½	
	16+	—	—	—
	29+	55	25	
	—	—	37	—
	23 48 53	23	55	48½
	0 3 16	0	10	44½
	28+	10	58	
25	41	11	11	
	3 53—	11	23	
	—	0	11	35
	a cloudy			
	D's 2d limb passed the wires vertical to the equator.	h Leonis passed the same vertical wires.		
	2 52 2	2	54	53
	15½	—	—	—
	28—	55	16½	
	39—	55	28+	
	52 50½	55	38	
	2 58 3—	3	0	41—
	15½	0	52½	
	28—	1	4—	
	39+	1	15½	
	58 51—	3	1	27—
	3 3 54	6	18½	
	4 6½		30+	
	19—		43	
	30		52	
	4 42½	7	5	
	3 15 10—	17	12	
	22+		24	
	34½		36+	
	45½		47	
	15 57+	17	58½	

At these observations the Star followed the D's center along the wire parallel to the equator.

# Difference of Right Ascension between the $\gamma$ 's Limb and $\ast$ 's.

		Time per Clock.					
1769 Sept.		$\gamma$ 's 2d limb passed the wire vertical to the equator.			$\gamma$ Leonisa passed the same vertical wires.		
$\gamma$ —25		h	'	"	h	'	"
		3	21	9+	3	23	0
				22			11 $\frac{1}{2}$
				34			24—
				45 $\frac{1}{2}$			34
		21	57		23	46	
		27	38 $\frac{1}{2}$		29	15 $\frac{1}{2}$	
			51			27	
		28	3			39	
		28	15—			50	
		3	28	26	30	1 $\frac{1}{2}$	
		34	49 $\frac{1}{2}$		—	—	—
		35	2		36	23 $\frac{1}{2}$	
			14 $\frac{1}{2}$		36	35	
			25+		36	46—	
		35	37		36	57	
		3	44	Clo.	—	—	—
		3	55	11	—	—	—
			24—		3	56	6
			34			18	
			47			28 $\frac{1}{2}$	
		55	58		56	40	
		58	29 $\frac{1}{2}$		59	6	
			42+			18	
			53+			29	
		59	5		59	41	
		Then cloudy					
		4	15		Clear		
		$\delta$ $\gamma$ passed the wires vertical to the equator.			$\gamma$ 's 2d limb passed the same wires.		
Oa.		h	'	"	h	'	"
$\gamma$ —16		4	9	18	4	12	10
			9	31			22+
			9	44 $\frac{1}{2}$			36
			9	55+			48
		4	10	8	4	13	0 $\frac{1}{2}$

At these observations the Star followed the  $\gamma$ 's center along the wire parallel to the equator.

At these observations the Star was about 4' north of the  $\gamma$ 's center.

Time per Clock			
D's 1st limb passed the wires vertical to the equator.		D's 2d limb passed the same wires.	
h	m	h	m
4	16 40	19	51—
	16 52+		4
	17 4		16½
	16		28
4	17 28	20	40½
	22 50	26	14
	3		27
	15		40—
	26		51½
23	38	27	4—
29	33	23	11
	46—		24
	58		37
	9		59
30	21—	34	1
4	54 47		21
	59½		33
	11½		46+
	23		57
55	35+	5	0 10+
5	4 52	9	47+
	5 4	—	—
	5 15½	10	11
5	5 27	5	10 24
5	12 25	5	17 37½
	38		51—
	50+		4—
13	2		15+
13	14	18	27½
5	25 46½	30	26½
	25 59		39:
	26 11½		51—
	26 23	31	2½
	26 35	31	16

The \* 10' south of the D's center, and the \* passed along the middle wire.

\* moved along the lower wire.

The \* moved along the middle wire, after these I set the wires that the \* passed exactly along the lower wire.

The \* 15' south of the D's center.

# Difference of Right Ascensions between the $\gamma$ 's Limb and $\gamma$ 's.

Time per Clock.			
1769 Oct.	$\gamma$ passed the wires vertical to the equator.	$\gamma$ 's 2d limb passed the same wires.	
$\gamma$ —16	h / "	h / "	
	5 38 4+	5 44 13	
	17+	26+	
	29	40—	
	41—	44 51	
	38 53—	45 3 :	
23		Then cloudy	
	$\gamma$ 's 2d limb passed the wires vertical to the equator.	a star of 6th mag. passed the same vertical wires	
$\gamma$ —23	h / "	h / "	
	3 39 55 $\frac{1}{2}$	3 43 16	
	8—	28	
	20—	40	
	30 $\frac{1}{2}$	50	
	40 42+	44 1	
	46 32+	49 40	
	45—	49 52	
	46 57	50 6	
	47 8+	— —	
	47 20 $\frac{1}{2}$	50 27—	
	55 3+	57 55	
	16—	58 7+	
	28—	19	
	38 $\frac{1}{2}$	29 $\frac{1}{2}$	
	55 50 $\frac{1}{2}$	58 41	
	4 1 21 $\frac{1}{2}$	4 4 1	
	4 53 9 $\frac{1}{2}$	54 14	
	20+	25	
	53 32 $\frac{7}{8}$	54 36—	
	5 1 41+	— —	
	1 54	2 43	
	2 6—	2 55 $\frac{1}{2}$	
	2 16 $\frac{1}{2}$	3 6 $\frac{1}{2}$	
	2 30—	3 18—	

The  $\star$  about 6' north of the  $\gamma$ 's center.—The wires faintly illuminated and the  $\star$  also appeared very faint.

The wires very indifferently illuminated, and the  $\star$  still appeared faint.

These Numbers are a little dubious.

clouds now began to interrupt the observations. Clear a few minutes before the  $\gamma$ 's limb, and  $\star$  passed the wires at the same time: and at

5 32 12 The  $\gamma$ 's 2d limb and  $\star$  was equal in right ascension: the  $\star$  by estimation 20' north of the  $\gamma$ 's center: then cloudy.

# The Tranfit of Venus.

1769 June 1-3	Time per clock	
	3 18	Rain
	3 45	Viewed the $\odot$ 's disk with the reflector (mag. 128 times), and saw nothing more than some large irregular black spots, with a black streak very near the edge of the $\odot$ 's limb on the Eastern side.
		Adjustment of the nonius on the side of the telescope, for distinct vision for the contacts
		Ditto for the micrometer
		Ditto for the wire eye glass
		In. Ten. Non. Mag. } times
		o 35 15 128
		o 30 5 62
		o 25 23
The air not quite clear	10 30	Cloudy
Ditto more dense	11 17 53	The external contact of Venus and the Sun's limb.
	35 30	The contact seemed to be formed by judging by their peripheries.
	36 8	Internal contact, the thread of light broke out.
		In. Ten. Non.
		o 1 16 to the right-hand of o
		o 1 8 to the left hand of o
		o 1 13 right
		o 1 6 left
	12 12	Cloudy
	4 o 20	} The $\odot$ 's horizontal diameter, hazy.
	4 o 20	
	1 oo ::	
	12 21	Cloudy
	o 1 7	} Venus's diameter.
	1 14	
	1 10	
		to the left-hand of o
		to the right-hand of o
		left-hand
		After these, I immediately extended the glasses again for the Sun's diameter, but was prevented by clouds from doing any thing farther.
	12 45	Cloudy
	50	Ditto

Eclipses of Jupiter's Satellites, Occultations of the  $\gamma$  with the fixed  $\star$ 's, and other Phænomena.

	Time per clock			Apparent Time			
	h	'	"	h	'	"	
1769							
April 5	1	33	12	13	49	36	Immersion 1st satellite of Jupiter.
June 3	11	17	53	6	41	13	External contact of Venus's and the Sun's limb.
	11	36	8	6	59	25	Internal ditto, the thread of light broke out.
	22	49	28	18	11	1	The eclipse of the Sun began.
July 1	15	43	34	9	20	52	Emerfion 1st satellite of Jupiter. { Twilight very strong, yet the satellites appeared well.
	21	20	19	12	42	16	Immerf. $\star$ into the $\gamma$ 's enlightened limb.
	21	33	27	13	56	18	Emerf. of ditto from the $\gamma$ 's dark limb.
Sept. 20	21	17	35	10	16	20	Immerf. of 1st $\star$ into $\gamma$ 's light limb.
	21	48	54	10	47	35	Emerf. of ditto from $\gamma$ 's dark limb.
	21	57	7	10	55	46,6	Em. of 2d $\star$ from $\gamma$ 's dark L. dubious to 3 or 4".
Sept. 25	4	26	15	17	8	2	{ Immerf. of h $\Omega$ into the $\gamma$ 's light limb. { Twilight pretty strong, but not to render the observation in the least dubious.
Oct. 16	3	50	46	15	23	33	{ Emerf. of $\delta$ $\gamma$ from the $\gamma$ 's dark L. { Immediately after, a very thin flying cloud passed over the $\gamma$ ; but I believe no part of it obstructed the observation.
Nov. 9	23	35	30	9	44	42	{ 19 $\star$ immersed into the $\gamma$ 's dark limb. The second is true to a second, but which of these minutes is true, was rendered dubious by accident.
	23	36	30	9	45	42	
Nov. 21	5	56	40	15	19	50	The $\star$ : $\Omega$ , seemingly emerged from the $\gamma$ 's dark limb, but rendered a little dubious by flying hazy clouds.

Observations of the  $\odot$ ,  $\uparrow$ , and  $\star$ 's passing the Meridian, made with a Transit Instrument, the length of the Telescope 4 feet, having 2 Object Glasses, and magnifying 50 times.

- 1769  
Sept.
- 21—21 The transit instrument, sent by the Royal Society, was brought to Cavan.
- 25—25 Began to set up the said instrument.
- 29—29 Examined the line of collimation of the transit instrument, and found it very much out.
- 30—30 Brought it very near, and found the level very good.
- Oct.
- 1—1 Brought the line of collimation quite exact (by many trials), using a distinct object at the distance of about two miles.
- 2—2 At noon cloudy; in the evening it began to clear.

January 1, 1750, the mean A. R. of the Pole $\star$ =	10 42 37	
Annual precef. 158'' then the precef. to this time =	+ 52 00	
Aberration in A. R.	+ 8 34	
Nutation in A. R.	+ 1 30	
	<hr/>	h / "
Appt. A. R. the 2d of October 1769.	11 44 41	0 46 59
Clock too slow for sidereal time by the observations of $\alpha$ Cygni made on the 30th of Sept.		— 56 27
Clock loses in the interval of time between $\alpha$ Cygni's passing the meridian and pole $\star$		— 0 4
		<hr/>

Pole  $\star$  transits the meridian, October 2d, at 23 50 28 by the clock.  
At this instant of time shewn per clock, I brought the middle wire to bisect the Pole  $\star$ , and after took the passage of the following  $\star$ 's over the meridian.

1st wire	2d wire	Time per clock of passing the me- ridian.	4th wire	5th wire
' /	' "	h / "		
		3 26 10 +		Aldebaran
		4 6 54 $\frac{1}{2}$		Rigel
		4 46 7		$\alpha$ Orion
		5 38 24 —		Syrrius

*Note.* Just before I brought the wire to the pole  $\star$ , I set the axis of the transit instrument horizontal by the level; and at 3<sup>h</sup> 52', I examined it again by the level, and found it very exact. In the morning I placed a mark in the meridian about  $\frac{1}{2}$  of a mile North, and took particular notice what natural marks the middle wire cut on the summits of two hills, the one North about two miles, and the other South at a greater distance; these served after as compleat marks in the meridian: and few meridians there are, I believe, of such a length. At first, before I could depend upon the instrument's keeping its direction all night; I sent a man to place a candle in the center of the mark placed in the meridian, and it was very seldom that I found it vary in the least: what small difference might sometimes appear, was more probably owing to the placing of the candle, than the movement of the instrument.

## Observations made with the Transit Instrument.

1769	1st wire	2d wire	Time per clock of passing the meridian.	4th wire	5th wire	
Oct.						
2—3	" "	" "	" "	" "	" "	
	14	25 58	3 25 46½ 4 45 43 5 38 00—	26 32 46 28 45+	27 18 12+ 39 31:	Aldebaran α Orion Syrius
3—4	Clouds	Clouds	11 43 13: 11 46 23—	3 26 10	47 51+ 26 56+ 37 50½ 39 8½	☉'s 1st limb ☉'s 2d limb Aldebaran Rigel α Orion Syrius.
	37+ 52 3½	22+ 36+ 50	4 6 7+ 4 45 21½ 5 37 37—	52— 6+ 22½		
4—5	15+ Clouds 42½	0 Clouds 29—	18 37 45½ Clouds 5 37 15½	38 30 45 44 1	15+ 28½ 38 47½	γ Aquilæ α Orion Syrius
5—6			23 49 12 3 24 40— 4 5 23 4 44 30+ 5 36 52— 6 29 5½	— 25½ 8— 21 38 29 50	— Clouds 52+: 46 5+ 24 34+	Pole *, above the Pole Aldeb. Rigel α Orion Syrius Procyon
6—10		3 12	12 3 57 6 7 18 35 53 18 40 7— 20 23 22— 20 27 51 33 15 3 23 10½	— 6 51+ — 51 24 7½ 28 37 34 0— 57—	— 36½ 22½ 41 36 24 54 29 23½ Clouds	☉'s 1st limb ☉'s 2d limb γ Aquilæ α Aquilæ δ's 1st limb γ Capricorn 1st C. ditto Aldeb.
	22½ 38 37 — Clouds	7+ 22— 22 35				Tried the line of collimation and the horizontal position of the axis, and found both correct.
7—11		2 46+ 59½ 14 44½	4 3 32— 4 42 45— 5 35 1— 6 27 14½	4 16+ 29 35 46½ 58½	— 14— 33 43	Rigel α Orion Syrius Procyon
8—12		9 50½	12 10 35 12 46— 22 4 33 4 3 10— 42 23—	— 13 30 5 18+ 54+ 7+	— 14 15 3+ 39½ 43 52—	☉'s 1st limb ☉'s 2d limb δ's 1st limb Rigel α Orion
	3 1½ Clouds	3 47— Clouds				

Observations made with the Transit Instrument.

	1st wire	2d wire	Time per clock of passing the meridian.	4th wire	5th wire	
1769						
Oa.	' "	' "	h ' "	' "	' "	
♀—13	55 42 17½ 31 + 45 1½	38 14 + 5 28— 2½ 16—	18 38 59½ 22 57 14— 4 2 48— 42 1— 5 34 17½ 6 26 31 +	39 44½ 57 59 3 32 45 3½ 15½	29— 58 44 + 4 17 30— 50 —	* Aquilæ ♀'s 1st limb Rigel * Orion Sirius Procyon
h—14	52½	51 39	12 19 27 + 23 52 26—	20 11½ 53 11 +	20 56 53 58—	☉'s 2d limb Very windy. ♀'s 1st limb Then cloudy.
☉—15	19 6 + 45—	19 52— 29 +	12 20 37 + 22 47 18 38 15— 41 47	— 23 31½ 38 59	— 24 16 + 39 44	☉'s 1st limb ☉'s 2d limb } windy. * Aquilæ § Ditto.
♂—16	28— 36 22 24 +	12½ 7— 9—	12 23 58 26 9— 18 37 52 4 40 54	38 53 + 36½ 38½	27 39 39 21 23	☉'s 1st limb ☉'s 2d limb * Aquilæ * Orion
♂—19	47 14½	35 32 59— 7 + 2 59 48 00½ 13 + 16 9 37 +	12 36 17½ 18 36 44 1 47 22½ 2 30 56 3 19 49— 4 0 33 4 39 46— 4 58 2 5 6 5 5 10 27—	37 2 + 29— 44 + 20 34½ 1 17½ 40 30 58 50— 6 52½ 11 16 +	Cloudy 13½ 32½ 21 21— 16— 38 5—	☉'s 2d limb * Aquilæ * Ceti η Pleiadum Aldebaran Rigel * Orion η Gemini μ Ditto ♀'s 2d limb
♀—20	35 59 0 + 11 1 22 24 6 29 10	36 44 + 45— 20 18 + 11 49 8 + Clouds	12 37 29 39 41½ 4 0 11 + 4 9 30 5 21 5 6 12 38 6 23 53 +	40 26½ 59— 10 14 + 51 13 26 + 24 38—	41 11 1 41— 59— 14 14 + 22	☉'s 1st limb ☉'s 2d limb Rigel γ Orion γ Gemini ♀'s 2d limb Procyon Pollux

Observations made with the Transit Instrument.

	1st wire	2d wire	Time per clock of passing the meridian.	4th wire	5th wire	
1769 O&.	"	"	" " "	" "	" "	
h-21	56 17+ Cl. Cl.	57 2½ Cl. -	22 57 49: 3 19 4 Cl.	Cl. Cl. 39 45+	Cl. Cl. Cl.	γ Pegasi Aldeb. α Orion
☉-22	- - - 21 39 4 35+	24 53 22 23+ 5 22	18 35 38 6 23 8+ 8 6 8½ 8 51 57+	36 23- 53- 6 28 57 6 54½ 52 42½	7+ 24 37 28 47: 7 41 28	α Aquilæ Procyon Pollux ☉'s 2d Limb Regulus
☽-23	46 16 45+	47 1 34 30-	12 47 46½ 49 59- 18 35 15	50 44 59+	51 29+ 44+	☉'s 1st Limb ☉'s 2d Limb α Aquilæ
♂-24	54½ 10 30½ 49 40+ 46 23	39 30½ 18+ 26 47 8	6 22 24 6 26 21+ 7 12 5 8 51 12- 9 47 54	8 11½ 12 52 57 48 39	13 39 42½ Clouds	Procyon Pollux Saturn's center Regulus ☉'s 2d Limb
♀-25	53 10+ 33 00	55+ 45-	12 54 41½ Clouds 18 34 30- 10 Examined the line of collimation, and axis with the level, and found both very good.	Cl. 14+	57 39+ 59-	☉'s 1st Limb ☉'s 2d Limb α Aquilæ
24-26	15 38½	25-	3 17 11½	17 57	43½	Aldeb. } From this time to the fourth of November cloudy, and rain.
Nov. h-4		29 12+ 10 40 16	13 29 59 32 14- 18 12 17+ 18 30 46-	32 59½ 13 7 30½	45½ 14 54 32 15	☉'s 1st Limb ☉'s 2d Limb ☉'s 1st Limb α Aquilæ
Great rains in the night.						
Hazy, the limb appeared faint.						

Observations

## Observations made with the Transit Instrument.

	1st wire	2d wire	Time per clock of passing the meridian.	4th wire	5th wire	
1769 Nov.	' "	' "	h ' "	' "	' "	
☉ — 5		35 4 38½ 58 8 1 29+	13 35 50½ 18 30 24— 18 58 54½ 19 2 17+ 19 13 20— 19 18 25½ 19 31 3	36 36½ 8½ 59 40 3 4½ 14 6— 31 47½	Cl. 53 3 52	☉'s 2d limb α Aquilæ 2β Capricorn ☽'s 1st limb N°. 439 zodiac, de la Caille Telescopic star a little N. of the fore- μ Aquarii [going one.
	Cloudy all the morning part.					
8 — 8	Tried the line of collimation, and the horizontal position of the axis, and found both exact.					
			11 46 48	47 32+	48 16½	Venus's center
4 — 9	46 37— 7 17— 20 44 18 29+	23 28 10 8 1½ 21 29— 19 15 23 13	13 48 10 50 26 18 28 55½ 20 8 46+ 20 22 14 22 17 27 22 20 0½ 22 23 58—	51 12+ 29 40 31— 58½ 20 46 24 42	58½ 24½ 15+ 23 43+ 21 31	☉'s 1st limb ☉'s 2d limb α Aquilæ β Aquarii γ Pegafi ν Piscium ☽'s 1st limb 19 Piscium
8 — 10	50 17 4— 40 46— 11 28— 52½ ☉ 12+ 6½	51 4 48+ 41 31½ 12 13½ 51 37½ ☉ 56½ 51—	13 51 51 54 7 18 28 34— 21 42 17½ 23 13 0— 3 52 23 4 1 41 4 31 36	53½ 18 3— 46— 7— 2 26— 32 20+	40— 3— 43 48+ 14 31+ 53 52— 10 33 5	☉'s 1st limb ☉'s 2d limb α Aquilæ α Pegafi ☽'s 1st limb Rigel γ Orion * Orion
h — 11	42—	26+	18 28 12—	56+	41—	α Aquilæ
☉ — 12	40 50½ 8 15+ 9 22	41 39+ 9 3 13½ 10 8	0 42 28— 1 9 51½ 2 22 2 3 10 55—	15+ 10 39— 22 50 40	44 3— 11 26+ 27—	α Arietis ☽'s 1st limb η Pleiadum Aldeb.

Observations

## Observations made with the Transit Instrument

1769	1st wire	2d wire	Time per clock or passing the meridian.	4th wire	5th wire	
Nov.	" "	" "	h " "	h " "	h " "	
8—14	25 36 Clouds 39— 22 36	8 13 21— Clouds 25 23 25½	14 9 00— 18 27 6— Clouds 3 10 12— 3 15 55— 3 24 15+	Clouds 5— Clouds 10 57+ 42½— 25 5—	10 33 35 0 43 20 11 43+— 25 54—	☉'s 2d limb α Aquilæ α Arietis Aldebaran γ Tauri ☽ 2d limb.
8—15	8 53+	9 40	14 10 27+ 12 45—	13 31+	14 18	☉'s 1st limb ☉'s 2d limb.
24—16	54½ 54½ 9 32½ 36 24—	40 12— 40½ 39— 10 19— 37 13—	14 16 31 0 41 00 3 9 27 4 29 24— 5 11 5+ 5 38 1+	17 17 41 48— 13— 8+ 11 51 38 50	4 42 36— 10 59— 53 37½ 39 39—	☉'s 2d limb α Arietis Aldebaran α Orion γ Gemino ☽'s 2d limb
The position of the instrument in the morning was about a second (in the equator) too much Eastward for Stars to the South of the Zenith.						* Occasioned by a fluttering more than common.
8—17	7 33½ 12 2½ 38 31+	39 50+ 19 47 39 19+	0 40 38+ 3 9 6— 6 13 32— 6 40 7+	26+ 51½ 14 16 40 54½	42 14 37½ Clouds 41 42½	α Arietis Aldebaran Procyon ☽'s 2d limb.
8—21	37 33— 6 4— 10 1½	38 21— 6 50— 48 10 47	0 39 9— 3 7 36+ 4 27 33 10 11 33—	57 22 17½ 10 4 0½ 12 17½	44½ 8 2½ 4 45 13 3	α Arietis Aldebaran α Orion ε ♈ ☽'s 2d limb.
8—22	58 10 Clouds	58 56 Cloudy	10 59 42 Clouds	0 27+ 12 50 17	1 13+ 12 51 4	☽'s 2d limb Arcturus.
24—23	2 ½ 22 17	40 9— 28 1½	14 40 57— 43 16 18 23 47	44 44 3 31+	50+ 16+	☉'s 1st limb ☉'s 2d limb α Aquilæ.

Observations made with the Transit Instrument.

	1st wire	2d wire	Time per clock of passing the meridian.	4th wire	5th wire	
1769						
Nov.	' "	h "	h ' "	' "	' "	
8 —24			12 48 45½	49 32½	50 20—	Arcturus.
8 —27	} Packing up the Instruments. { Tried the line of collimation, and found it good.					
8 —28						
Dec. 7	Sent off the Instruments for Dublin.					

Charles Mafon.