LXXXVI. *Observations for proving the Going of Mr.* Ellicott's *Clock, at* St. Helena ; *by Mr.* Charles Mason.

Read May 6, 1762.

IN my return from the cape of Good Hope, the clock, ufed in the obfervations made there, was fet going at James's fort, St. Helena, the pendulum remaining as at the Cape. Here I found myfelf at a great lofs, to get obfervations to prove its motion, the heavens being almoft perpetually covered with clouds. At length, confidering, that the place being fituated in fuch a narrow deep valley, if the times of the defcent of the ftars, over the weftern ridge of rocks, (the altitude of whofe neareft fummit was about 30°, and diftant about a quarter of a mile, at the obfervatory) were obferved, it would give the time per clock, in a fidereal day ; and the chances for fuch obfervations would be greater, than by any other method, as they might be continued the whole night. Accordingly, I began to obferve, by fixing the eye to a point : but this was foon improved, by the Reverend Mr. Mafkelyne, by making the ftars defcend each night, in the fame part of the telefcope of the equal altitude inftrument : and it was very beautiful to fee, how inftantaneoufly they difappeared.

The difference of the effect of gravity at the two places, on the going of the clock, may be feen, by comparing the following with the obfervations made at the Cape.

1761.

1761.	Time per clock.			Observations of the same letter to be compared together.	From the mean of the observations, the clock loses of siderial time per day.	
	h	′	″		″	
Octob. ♄ 31.	21	48	58 —	Star - - *a*		⎫ Stars of the first, second, or third magnitude, descended the hill, or rather the ridge of a keen extensive rock, that forms one side of the valley.
	22	2	42 +	* - - *c*	57.0	
Nov. ♃ 5.	21	44	12	Star - - *a*		
	21	57	57½	* - - *c*		
♀ 6.	22	10	34	* - - *e*		
		50	44 +	- - - *f*		
		54	8 +	- - - *g*		
	23	0	4½	- - - *h*		⎫ Per Mr. Maskelyne.
		4	50	- - - *i*	57.3	
☉ 8.	22	8	26	* - - *e*		
		12	8	- - - *p*		
		48	49 +	- - - *f*		
		52	14 —	- - - *g*	57.3	
☽ 9.	22	11	10½	* - - *p*		Stars descended.
		47	52	- - - *f*		
		51	16 +	- - - *g*		
		57	12½	- - - *h*		
	23	1	57	- - - *i*	57.3	
♂ 10.	22	20	3 +	* - - *r*		⎫ Per Mr. Maskelyne.
		46	55 —	- - - *f*		
		50	19	- - - *g*		
		56	14½	- - - *h*		
	23	1	0	- - - *i*	57.7	
☉ 15.	22	15	15 —	* - - *r*		
		42	6	- - - *f*		
		42	30 +	- - - *g*		
		56	11 —	- - - *i*	57.4	

1761.	Time per clock.			Observations of the same letter to be compared together.	From the mean of the observations, the clock loses of siderial time per day.	
Nov.	h	′	″		″	
☽ 16.	22	41	8 +	Star - - f		
		44	33 −	- - - g		
		50	29	- - - h		
		55	14 −	- - - i		
♃ 19.	22	41	40 +	∗ - - g	57.5	
		47	36½ −	- - - h		
		52	21½	- - - i		
Dec.						⎫ These are a set of different stars, the others descending in the daylight.
♃ 3.	23	45	44	∗ - - a		
		50	44½	- - - b		
		51	10 −	- - - c		
		52	19	- - - d		
		53	42	- - - e		
♄ 5.	23	51	43 +	∗ - - e	59.4	
☉ 6.	23	42	47 −	∗ - - a	59.1	
		47	47	- - - b		
		48	12 +	- - - c		
		49	22	- - - d		
		50	44 +	- - - e		

☿ 9. This day I difcovered the wedges behind the clock, which was put to make it ftand perpendicular, were loofe; fhrunk, I fuppofe, by the drynefs of the place. Quære, If this was not the caufe of the above difference.

The wedges being again fecured,

☉ 13.	0	17	5 :	∗ - - g		⎫ These are different stars. Per Mr. Mafkelyne.
		26	16	- - - i	58.5	
♂ 15.	0	15	7 :	∗ - - g		
		24	20	- - - i	59.0	

1761.	Time per clock.	Obſervations of the ſame letter to be compared together.		From the mean of the obſervations, the clock loſes of ſiderial time per day.	
Dec.	h ′ ″			″	
☿ 16.	0 21 47 —:	Star - -	γ		
	23 21	- - -	i		
	24 46	- - -	k		
				58.85	} Per Mr. Maſkelyne.
♃ 17.	0 20 47 +	✳ - -	γ		
	22 22	- - -	i		
	23 47 +	- - -	k		
♄ 19.	0 49 31	✳ - -	l		
	55 21 +	- - -	m		
	1 2 56½	- - -	n		
	1 9 14½	- - -	o		
				58.4	
☉ 20.	0 48 33	✳ - -	l		
	54 23 +	- - -	m		
	1 1 58	- - -	n		
	8 15½	- - -	o		
				59.0	
♂ 22.	0 46 35 +	✳ - -	l		
	52 25 —	- - -	m		
	1 6 18 —	- - -	o		

1762. Jan.

♂ 5. | The clock was ſtopped, and an arch put on, to ſhew the degrees and minutes the pendulum vibrates.

☿ 6. | The apparent zenith diſtance of Aldebaran upon the meridian = 31° 55′ 20″.

♄ 9.	1 49 55	✳ - -	p		
	52 31 +	Archarnar	q		
	55 27 +	- - -	r		
	2 8 28	- - -	β		
	6 42 0	- - - -		- - -	{ The pendulum vibrates 2° 37′ on each ſide of the perpendicular.
				58.4	

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1762.	Time per clock.			Observations of the same letter to be compared together.		From the mean of the observations, the clock loses of fiderial time per day.
	h	′	″			″
Jan. ☉ 10.	1	48	56	Star – –	p	
		51	32½	Archarnar	q	
		54	29½	– – –	r	
	2	7	30	– – –	β	
	5	18	0	– – – –		
☽ 11.	4	56	0	– – – –		
♂ 12.	14	47	0	– – – –		
	2	45	53	– – –	δ	
						59.0
☿ 13.	16	20	0	– – – –		
	2	44	54	* – –	δ	
	3	40	36 :	– – –	u	
		44	42 +	– – –	z	
						59.1
♃ 14.	16	39	0	– – – –		
	3	39	37	* – –	μ	
		43	43	– – –	z	
		51	35 +	– – –	y	
	4	23	47	– – –	a	
♀ 15.	16	11	0	– – – –		
						58.6
♄ 16.	3	9	5 –	* – –	s	
		16	33 –	– – –	t	
		37	40 +	– – –	u	
		41	46 +	– – –	z	
		49	38	– – –	y	
	4	21	50	– – –	a	
☉ 17.	15	38	0	– – – –		
☽ 18.	1	57	0	– – – –		
						58.9

	•	′	″
Vibration	2	34	0
Ditto –	2	34	0
Ditto –	2	55	0
Per Mr. Maſkelyne.			
Vibration	2	54	0
Ditto –	2	59	0
Ditto –	2	58	0
Per Mr. Maſkelyne.			
Vibration	2	53	0
Ditto –	2	55	0

1762.

1762.	Time per clock.	Observations of the same letter to be compared together.	From the mean of the observations, the clock loses of siderial time per day.				
Jan.	h ′ ″		″		• ′ ″		
♂ 19.	1 59 0	— — — —		Vibration	2 58 0		
☿ 20.	3 2 0	— — — —		Ditto —	3 4 0		
♃ 21.	2 36 5	Star — — x					
	3 4 10	— — — s					
	11 38½ :	— — — t					
	32 46	— — — u					
	4 1 14	— — — w					
	4 40 0	— — — —		Ditto —	3 2 0		
♀ 22.	2 35 6 +	✳ — — x	59.0				
	3 3 11 —	— — — s					
	10 39½	— — — t					
	31 47 +	— — — u					
	4 0 15	— — — w					
	15 57 —	— — — a					
	4 50 0	— — — —		Ditto —	3 3 0		

♄ 23. The clock taken down, and the pendulum secured, as at the cape of Good Hope, after the direction given per Mr. Ellicott the maker.

From the mean of a great number of observations, taken at different times of the day and night, Farenheit's thermometer stood at - - - - } in { November 68.7 } from 12th
December 70.3 } to
January 72.3 } the 18th.

The thermometer was hung by the side of the clock, and I never saw it higher (from 12th of November 1761 to January 18th, 1762) than 74½, or lower than 67.

Those observations marked : are a little dubious.

Charles Mason.