

XVII. *A Letter from Monsieur Wargentín, Secretary to the Royal Academy of Sciences in Sweden, to Mr. John Ellicott, F. R. S. relating to the late Transit of Venus.*

Stockholm, December 24, 1762.

Read March 17, 1763. **T**HE observations upon the last transit of Venus over the Sun made at the Cape of Good Hope are excellent, and seem to decide, that the horizontal parallax of the Sun is  $8''$ , 1 or  $8''$ , 3 at most. I had before found it to be that quantity, from the observations made in Europe compared together; but the observations made at the Cape confirm it with the greatest evidence.

It is of importance to be assured of the longitude of the places where the observations were made. I have endeavoured to determine them the best I was able by observations of the eclipses of Jupiter's satellites, made at the same places. That you may the better judge, I thought proper to send you all the observations of these satellites made at different places the last year. I desire you would communicate them to Mr. Mason, and all those who interest themselves in the research of the parallax. It is pity that messieurs L'Abbè Chappe, and Rumoski, did not succeed in observing several eclipses of the satellites, at Tobieske and Selenginsk, the better to confirm the Longitudes of those places. However it appears to me, that the difference between the meridians of

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Greenwich and Tobieské is scarcely more than  $4^h 32' 55''$ . That between the meridians of Greenwich and Selenginsk, to judge from the three immersions observed there, should be but  $7^h 6' 0$ , but from other considerations, I think it must be 10 or 15' more. If the longitude of these places should be more exactly determined, I am persuaded that we should obtain the parallax of the Sun to nearly the tenth of a second, so exact the observations made at Selenginsk and Tobieské and the Cape appear to me.

I see you did not communicate to the Royal Society all the observations made by Mr. Planman at Cajaneberg, they however deserve to be preserved. He observed

	h	'	''
The beginning of the entrance - - at	3	59	56M
Total immersion of Venus or interior contact - - - - -	4	18	5
Second interior contact or beginning of the exit - - - - -	10	7	59
Total emersion - - - - -	10	26	22

Mr. Planman made use of a telescope of 20 or 21 feet; the latitude of Cajanebourg is  $64^{\circ} 13' 30''$ ; the difference of meridians between Greenwich and Cajanebourg is sufficiently determined by observations upon the eclipse of the Moon the 18th May 1761, made at Stockholm and Cajanebourg.

I have the honour to be with the greatest esteem,

S I R,

Your very humble and obedient servant,

P. Wargentin.

Eclipses primi satellitis Jovis, observatæ Anno 1761: addito errore calculi pro quavis observatione, ut appareat, quæ sint præstantiores. In calculo autem posui differentiam meridianorum inter

		h	'	"
Observatorium Grenovic. et Paris.	—	0	9	10
Grenov. et Stockholm	—	1	12	0
Grenov. et Upsaliense	—	1	10	20
Grenov. et Massil.	—	0	21	19
Grenov. et Cap. B. Spei	—	1	13	35
Grenov. et Insul. Rødrig	-	4	12	52
Grenov. et Selenginsk	—	7	6	15
Grenov. et Cajaneburgh	-	1	50	40

		h	'	"			h	'	"	
Jan. 7.	Em:	5	4	35	Stockholmia	+	0	27		
June 13.	Im.	14	37	47	Massilia	- - -	—	0	21*	
	20.	—	17	22	26	Cap. Bonæ Spei	+	0	31	
July 22.	—	12	45	15	Paris	- - - -	+	0	7	
			12	35	39	Grenov.	- - - -	+	0	33
			16	48	55	Inf. Rodriga	-	+	0	9
	29.	—	14	38	35	Paris	- - - -	+	0	33
			14	50	28	Massilia	- - - -	+	0	49
			15	42	44	Cap. B. Spei	-	+	0	49
	31.	—	13	10	29	Inf. Rodrig.	-	+	0	56*
Aug. 7.	—	10	51	52	Grenovic.	- - -	+	1	8*	
			12	4	51	Stockholm. bona	+	0	9	
			11	13	49	Massilia	- - - -	+	0	30
			12	5	46	Cap. B. Spei	-	+	0	49
	14.	—	13	59	39	Stockholm. certa.	+	0	10	
			14	0	50	Cap. B. Sp.	-	+	0	34

Aug.

Aug. 21. Im.	h	l	''	Paris = = = =	+	o	''
	14	51	56				34
23. —	15	56	2	Cap. B. Spei -	+	o	53
	9	20	49	Paris - - - -	+	o	40
25. —	10	22	42	Upsaliæ - - - -	-	o	3*
	10	25	10	Cap. B. Spei -	+	o	44
28. —	10	46	24	Selenginsk - -	+	1	6*
30. —	16	48	41	Paris - - - -	-	o	12*
	11	7	58	Grenovici - -	+	o	27
Sept. 1. —	12	17	43	Upsaliæ - - -	+	1	2*
	12	21	32	Cap. B. Spei -	+	o	28
8. —	12	58	50	Cajaneburgi -	+	o	15
	9	49	40	Inf. Rodrig. -	+	o	40
15. —	7	55	37	Maffiliæ - - -	-	o	17*
	9	23	40	Cajaneburgi -	+	1	1*
24. Em.	9	39	55	Paris - - - -	+	o	5
	8	7	46	Grenovici - -	+	1	1
Oct. 1. —	8	29	11	Maffiliæ - - -	+	o	55
	9	21	35	Cap. B. Spei -	+	o	47
10. —	10	13	56	Paris - - - -	+	o	59
	6	40	8	Paris - - - -	+	o	45
17. —	8	36	38	Paris - - - -	+	o	46
	8	51	19	Paris - - - -	+	1	48*
Nov. 9. —	10	46	26	Paris - - - -	+	1	6
	5	27	40	Maffiliæ - - -	+	o	32*
18. —	10	5	4	Stockholmiæ -	+	o	32*
	4	33	8	Stockholmiæ -	+	o	39
11. —	6	25	44	Stockholmiæ -	+	o	43

Observationes secundi satellitis, eodem anno habitæ.

		h					
		'	"		'	"	
June 11.	Im.	14	51	24	Cap. B. Spei	- + 0	14
18.	—	17	27	11	Cap. B. Spei	- + 0	4
July 13.	—	13	28	53	Paris - - -	- + 0	9
20.	—	16	5	1	Paris - - -	- + 0	35
		15	54	28	Grenovici - -	- + 1	58*
		17	9	42	Caput B. Spei	+ 0	19
31.	—	14	57	17	Selenginsk - -	- + 1	41*
Aug. 7.	—	10	30	9	Grenovici - -	- + 0	59
		11	43	1	Stockh. optima	+ 0	7
		11	43	26	Cap. B. Spei -	- + 1	17*
14.	—	14	21	37	Stockh. certa -	- + 0	17
		13	18	39	Paris - - -	- + 0	25
25.	—	12	15	4	Selenginsk - -	- + 0	9
Sept. 1.	—	9	1	6	Stockh. certa -	- 0	5
		9	2	20	Cap. B. Spei -	- + 0	16
		8	59	19	Upsaliæ - - -	- + 1	2*
8.	—	10	37	59	Parisiis - - -	- + 0	26
		10	29	30	Grenovici - -	- 0	5
		10	50	40	Maffiliæ - - -	- 0	6
		11	42	20	Cap. B. Spei.	- + 0	30
15.	—	13	6	36	Grenovici - -	- + 3	12*
Oct. 28.	Em.	8	9	51	Maffiliæ - - -	- 0	7
Nov. 11.	—	13	12	43	Paris - - -	- 0	2
22.	—	5	18	12	Maffiliæ - - -	- + 0	49
		6	9	24	Stockh. dub. -	- + 0	18*
Dec. 6.	—	10	15	59	Paris - - -	- + 0	46

Eclipses tertii satellitis Jovis, observatæ anno 1761.

	h	'	"		'	"
Maj. 11. Im.	15	19	3	Paris - - - - -	3	30
Jun. 16. Em.	15	26	32	Cap. B. Spei - - - - -	2	21*
23. Im.	15	20	6	Paris - - - - -	5	20
	15	32	20	Maffiliæ - - - - -	5	25
	15	10	24	Grenovici - - - - -	4	48
Jul. 29. —	11	18	49	Paris - - - - -	4	10*
	12	23	23	Stockh. certa - - - - -	5	54
	12	24	0	Cap. B. Spei - - - - -	5	8
Em.	15	17	13	Cap. B. Spei + - - - -	0	23
	15	15	22	Stockh. certa - + - - -	0	51
Aug. 5. Im.	15	34	51	Paris - - - - -	6	18
Sept. 3. —	8	36	36	Cap. B. Spei - - - - -	5	25
	9	13	39	Cajaneburg - - - - -	5	4
10. —	11	27	6	Grenovici - - - - -	4	53
	11	49	9	Maffiliæ - - - - -	5	37
Nov. 21. Em.	6	41	9	Paris - - - - -	+ 0	15
	6	52	44	Maffiliæ - - - - -	+ 0	51
28. Im.	8	10	29	Paris - - - - -	5	24
	8	23	31	Maffiliæ - - - - -	6	18
	9	14	22	Stockh. optima - - - - -	6	28
Em.	10	40	57	Paris - - - - -	0	16
	10	52	55	Maffiliæ - - - - -	0	6
	11	44	34	Stockh. dub. - - - - -	1	4*

Eclipses quarti satellitis, observatæ Anno 1761:

	h	'	"		+	'	"
Aug. 10. Im.	14	25	15	Parisiis - - - -	+	2	18
	15	32	57	Cap. bonæ Spei —	0	59	
27. —	8	41	40	Grenovici - -	—	0	21
	9	2	3	Maffiliæ - - -	+	0	35
	9	53	32	Cap. B. Spei -	+	1	22
	9	50	18	Upsaliæ - - -	+	1	21
	10	16	23	Tornæ - - - -	+	1	34
Em.	11	47	41	Paris - - - -	+	3	10
	12	1	52	Maffiliæ - - -	+	1	8*
	12	49	0	Cap. B. Spei. -	+	6	16
	12	48	7	Upsaliæ - - -	+	3	54
	12	47	31	Stockh. certa -	+	6	10
	13	15	13	Tornæ - - - -	+	3	6
Nov. 2. Im:	10	51	47	Maffiliæ - - -	+	5	50
Em.	12	57	37	Maffiliæ - - -	+	7	44
19. Im.	6	6	34	Stockh. tub. max.—	8	51	
	6	2	30	Ibid. tub. minore—	4	47	
	4	57	16	Paris - - - - -	—	2	23
Em.	6	56	29	Paris - - - - -	+	6	32

Observationes asterisco \* notatæ, minus certas suspicor. Differentiæ inter reliquas tribuendæ videntur differentiis telescopiorum, majori minorive aëris serenitati, et fortassis cuidam incertitudini circa differentias meridianorum.

Observationes Stockholmenfes habitæ sunt telescopio novo Dollondiano 10 ped. objecta 120<sup>es</sup> secundum diametros amplificante.