

XII. *Observations of Miss Herschel's Comet, in August and September, 1786. By the Rev. Francis Wollaston, LL.B. F. R. S.*

Read December 21, 1786.

THE comet of August last, having afforded me an opportunity of putting to some test the system of wires, a description of which I laid before this Society\*, I think it may not be improper, as a sequel to that Paper, to give an account of the observations I have made with it on this occasion. Though, I believe, I have nearly ascertained with it the position of about 200 small stars in the Corona Borealis; yet such observations could not be examined by other gentlemen, without their going over the same ground. But this comet, which must have been observed by many, will serve to shew them, whether I have come near to the truth in this way; and what dependence may be had upon observations made with such an instrument.

The telescope to which I applied it was an achromatic object-glass of DOLLOND, of 16 inches focal length, and 2 inches aperture, with a RAMSDEN'S eye-glass, magnifying about 25 times, mounted on a very firm equatorial stand: with this, which takes in two degrees of a great circle, I compared the times of the comet and such stars as lay convenient, as they

\* See vol. LXXV. p. 346.

severally

severally passed the centre wire and other adjoining wires; making occasionally a diagram, or drawing of their appearance in that telescope, in the manner represented in a Paper communicated to this Society in the year 1784\*. This I found of great service; both in ascertaining the stars of comparison, and in catching something of an observation on those evenings, which were not clear enough, or steady enough, for me to take the transits (as August 14. and 19. and Sept. 21.). In this way alone, one may be certain of the relative positions to five minutes of a degree in right-ascension or declination, under the most unfavourable circumstances, and commonly *much* nearer; and this occasionally has its use.

This comet was first discovered August 1, 1786, at Slough, near Windfor, by Miss CAROLINE HERSCHEL, Sister to Dr. WILLIAM HERSCHEL, and assistant to him, and almost as zealous an astronomer as himself; who, in his absence, swept the heavens with her telescope for that purpose. She observed it again August 2. and then communicated the news of it to her friends. Her account (as I recollect it, for I had not the original) was, that August 1. it was about equi-distant from  $\xi$  and  $\nu$  Ursæ Majoris, and N<sup>o</sup> 14, 15, and 16. Comæ Berenices, about 1° south of the parallel of N<sup>o</sup> 15. Comæ. The news reached me on the 4th, which was cloudy; but on the 5th I saw the comet; and, having adjusted the wires, compared its passage with the adjoining stars; of which the following are the results. The times noted down are all sidereal; because they were so observed, and the reduction of them is most simple. The stars of comparison are mostly those of the British Catalogue: and to that the numbers refer; excepting a few, which I take to be stars to be found in the *Catalogue*

\* See vol. LXXIV. p. 181.

complet d'Etoiles, par Bode, 1782; who, at the end of each constellation in FLAMSTEED's Catalogue, adds such stars, omitted by him, as have been observed by other astronomers, and carries on the numbers of each observer in succession. To them the name of the observer is here inserted. Those without any name or number are smaller stars, not in that or probably in any Catalogue.

Days.	At what hour sid.	Comet preceded or followed.	What star.	Differences		
				in R. A. sid. time.	in Decl.	
1786	h. ' "			' "	° ' "	
♃ Aug. 5	19 27 40	Com. prec.	a * -	7 2	9 32	North of the star.
			N° 12. Com. Ber.	9 17	55 37	N.
			N° 16. -	13 45		
	19 51 57	Com. prec.	N° 13. -	11 4		
			N° 14. -	13 5,5	28 27	S.
			N° 16. -	13 43	2 26	S.
♁ - 6	18 50 44	Com. prec.	a * -	0 5		N. about 1° 10'.
			a * -	0 6	27 11	N.
			N° 50 (Darquier)	0 26,5	2 26	S.
			N° 14. -	6 14	14 31	S.
			N° 16. -	6 49,5	12 2	N.
	19 9 23	Com. prec.	a * -	0 1		
			N° 50 (Darquier)	0 22,5	1 53	S.
			N° 13. -	4 1,5		
			N° 14. -	6 10	14 13	S.
			N° 16. -	6 44,7	12 36	N.
♃ - 7	19 5 10	Com. foll.	N° 14. -	0 48	0 39	S.
			N° 16. -	0 12	26 14	N.
♁ - 8	18 21 22	Com. foll.	N° 14. -	7 29	11 2	N.
			N° 16. -	6 53	37 52	N.
	18 35 52	Com. foll.	N° 14. -	7 33	11 22	N.
			N° 16. -	6 56,5	38 15	N.
	18 51 30	Com. foll.	N° 14. -	7 38,7	10 53	N.
			N° 16. -	7 3,4	37 49	N.
♁ - 11	18 30 42	Com. foll.	N° 30. -	4 29,2	21 27	N.
			N° 31. -	2 5	22 7	N.
	18 38 15	Com. foll.	N° 30. -	4 31,7	21 25	N.
			N° 31. -	2 7,5	22 8	N.
	19 9 49	Com. foll.	N° 14. -	27 51	0 38 13	N.
			N° 16. -	27 15	1 4 0	N. Quære this Decl.

There is some error here, for which I cannot account.

Days.	At what hour sid.		Comet preceded or followed.	What star.	Differences		
					in R.A. sid. time.	in Decl.	
1786	h.	' "			' "	' "	
♀ Aug. 11	19	9 49	Com. foll.	N° 30. -	4 41	21 34	N.
				N° 31. -	2 16	22 16	N.
♃ - 14	19	6 0	Com. foll.	N° 43. about	0 50	22 0	N. per diagram only.
♃ - 19	19	10 0	Com. foll.	a * Can. venat.	1 50	12 0	N.
				Nebula, N° 3.	0 20	0 20	N.
			Com. prec.	a small * .	0 10	0 20	N.
	19	55 0	Com. foll.	a * .	2 5	12 0	N.
				Nebula, N° 3.	0 35	0 20	S.
			Com. foll.	the small *	0 5	0 20	N.
♁ - 20	18	44 2	Com. foll.	a * can. venat.	7 19	9 36	N.
				Nebula, N° 3.	5 51	9 13	S. Quære this.
				a * -	3 48 :		
	18	55 29	Com. foll.	a * -	7 23	9 55	N.
				Nebula, N° 3.	5 51	7 42	S.
				a * -	3 52	38 13	N.
♃ - 22	18	33 18	Com. foll.	N° 9. Bootis	2 20	39 6	N.
			Com. prec.	N° 11. -	2 20,5	46 26	N.
	18	45 38	Com. foll.	a * -	5 42,5	31 37	S.
				a * -	2 49	32 26	S.
				N° 9. -	2 23	38 22	N.
			Com. prec.	N° 11. -	2 17	45 48	N.
	18	58 18	Com. foll.	a * -	5 45	30 34	S.
				a * -	2 51		
				N° 9. -	2 26	39 26	N.
	19	8 31	Com. foll.	N° 9. -	2 29	39 31	N.
			Com. prec.	N° 11. -	2 11	47 3	N.
♃ - 23	19	6 26	Com. foll.	N° 11. -	3 6	41 32	N.
♃ - 24	19	2 22	Com. foll.	N° 9. -	13 1	28 49	N.
				N° 11. -	8 20	36 4	N.
				N° 72 (Darquier)	6 2	28 59	N.
				a * -	2 28	26 32	S.
♃ - 25	19	13 24	Com. foll.	N° 9. -	18 19	23 46	N.
				N° 11. -	13 38	31 5	N.
				a * -	11 20	12 45	N.
				a * -	8 22,5	10 49	N.
				a * -	7 46,5	21 25	S.
			Com. prec.	a * -	3 57	29 32	S.
				a * -	9 19 :	41 9 :	N.
				N° 84 (Darquier)	9 26	32 43	N.

All these were only judged from a diagram.

In this set there is probably an error of 1' in the Decl. of the com.

Days.	At what hour sid.	Comet preceded or followed.	What star.	Differences		
				in R.A. sid. time.	in Decl.	
1786	h.			' "	" "	
Aug. 25	19 27 45	Com. prec.	a * -	3 56	30 51	N.
	19 27 45	Com. prec.	a small * N <sup>o</sup> 84 (Darquier)	9 13,5	39 54	N.
				9 24	31 50	N.
	19 43 39	Com. prec.	N <sup>o</sup> 79 (Darquier)	0 40	10 53	N.
- 29	19 20 27	Com. foll.	a * -	3 53	31 15	S.
		Com. prec.	N <sup>o</sup> 91 (Darquier)	1 56		
		Com. foll.	N <sup>o</sup> 91 (Darquier)	2 13,5	0 44	S.
		Com. prec.	ε Bootis -	2 30	8 5	S.
- 30	18 1 30	Com. prec.	ε Bootis -	6 24	19 0	N. } windy.
	18 15 49	Com. prec.	N <sup>o</sup> 91 (Darquier)	2 27	7 36	S.
		Com. prec.	ε Bootis -	6 14	19 9	N.
- 31	19 18 24	Com. prec.	ε - -	1 29,5	10 49	N. } I cannot recon-
	19 21 37	Com. prec.	ε - -	1 30	11 6	N. } cile these. It
	19 24 41	Com. prec.	ε - -	1 30 :	9 22	N. } was very windy.
Sept. 1	19 56 16	Com. foll.	ε - -	3 12	0 26	N. } Quære the Decl.
	20 5 50	Com. foll.	ε - -	3 12	1 46	N.
- 2	19 47 7	Com. foll.	ε - -	7 32	8 27	S.
		Com. prec.	a * -	0 24		
	20 7 10	Com. foll.	ε - -	7 36	8 40	S.
		Com. prec.	a * -	0 17	29 14	N.
- 21	20 45 0	Com. foll.	π Serpentis 1 <sup>ma</sup>	1 32	58 0	N. per diagram only,

The comet growing faint, I did not follow it any farther. During the whole time, it was invisible to the naked eye, and without any tail. Its appearance was so very similar to the nebula (N<sup>o</sup> 3. in MESSIER'S Catalogue inserted in the *Connoissance des Temps* for 1784, and some other years) as scarcely to be distinguished from it when in the telescope together; though it certainly had a brighter spot in the centre.

The latter observations were not quite so satisfactory as the preceding; the comet growing faint. Those of the nebula, August 20. were also somewhat doubtful; the nebula not having the lucid point in the centre which the comet had; and therefore not being so easy to observe, especially in passing the oblique wires.

Upon the whole, I think, I may with confidence recommend such an instrument, as very convenient for sweeping the heavens, and pretty well ascertaining the position of what one discovers. I have here transcribed many observations which might better have been suppressed for the credit of the rest; but from them alone it is, that a judgement can be formed of the errors to which I was liable (which yet may possibly have been errors of calculation), and how far such an instrument is deserving of any farther recommendation. A larger telescope and greater magnifying power, to which I can apply these wires, certainly would have been capable of greater accuracy: but the field being smaller, the stars of comparison would have been the fewer, and the series of observations less connected. I have at other times used it with a DOLLOND'S eye-glass, with which it takes in a field of nearly three degrees; but the magnifying power is then so much the less, that, for this kind of observations, I prefer that of RAMSDEN, with which I can observe stars down to what I call the tenth or eleventh magnitude, and, I think, with some degree of precision.

Chilchurst, Nov. 18, 1786.

