
VII. OBSERVATIONS of the Places of the GEORGIAN PLANET, made at Edinburgh with an Equatoreal Instrument. By JOHN ROBISON, A. M. F. R. S. EDIN. and Professor of Natural Philosophy in the University of Edinburgh.

[Read by the Author, March 7. 1787.]

	M. T. Edin.	Apt. Lon. Plan.	Er. theor.	Apt. lat. N.	Compar.
	d. h. ' "	s. o. ' "	"	o. ' "	
1787. Jan.	12. 06. 39. 24	3. 23. 35. 17	+8	—32. 20	4
	15. 06. 05. 11	3. 23. 27. 44	—7	—32. 20	3
	17. 06. 13. 16	3. 23. 22. 17	+5	—32. 19	2
	18. 06. 05. 33	3. 23. 19. 42	+2	—32. 21	2
	20 06. 23. 04	3. 23. 14. 24	+7	—32. 17	4

HENCE it may be deduced, (by following the method described in a paper formerly read to this Society*) that the planet was in opposition January 13^d. 04^b. 56^c M. T. Greenwich, in longitude, 3°. 23°. 32'. 24" from the mean equinox, with —°. 30'. 38" north heliocentric latitude.

THE error of the theory in longitude is nearly +5", and in latitude nearly —18".

I ATTRIBUTE this error in latitude to the different manner in which I observed the declinations. I formerly observed the difference of declination between the planet and fixed star by means of a common micrometer. But I was obliged to substitute Dr BRADLEY's rhombus for my micrometer, which had received an injury which I could not get repaired in time. If this be allowed, the error in longitude will be diminished nearly 2".

MY telescope has an achromatic object glass of 44 inches focal distance, magnifies $19\frac{1}{2}$ times, and takes in a distinct field of 92'.

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92'. The planet was always compared with at least two stars, which passed through the field without altering the position of the instrument. The interval between the transits of the fixed stars, compared with their difference in right ascension in the tables, shows the error of the position of the horary wire; and the planet's difference in declination shows what portion of this error is to be applied to the time of its transit. When the position of the horary wire was very oblique to the horizon, and the altitudes small, a correction was made for the difference in refraction.

BOTH ends of the polar axis were firmly supported in a stone wall. The telescope turned round on a pin within two inches of the upper pivot of the axis, and close by the object glass. The other end of the telescope was supported (at the place of the wires) by a stiff rod, which turned round a pin within two inches of the lower end of the polar axis; so that the telescope, axis and this rod, formed a triangle. Another stiff rod was fastened to the telescope at the place of the wires, with a double joint, and its other end passed through a socket, firmly fixed on the side of the window, where it was held fast by a screw-pin. The rod was in a plane, nearly parallel to the equator. It is easy to see that, by this construction, each part of the instrument was exposed to a longitudinal strain alone, and all effects of the tremor of its parts were avoided. It was so completely free from any inconvenience of this kind, that, even in very boisterous winds, the image of the star was perfectly steady, and free from every kind of quivering. I never found any two comparisons of the planet with the same pair of stars differ above half a second in time. As the instrument was so exact, and did not (exclusive of the telescope) cost above three pounds, I thought that this short account of it would be acceptable to such as are not provided with those expensive instruments which are thought essentially necessary for making good and useful observations.