EPHEMERIS OF SWIFT'S COMET.

The following is a continuation of Mr. Upton's Ephemeris, which he has corrected by observations made at Washington up to Jan. 7, 1881. Mr. Wendell, at Harvard College Observatory, obtained an observation for position on Jan. 3, and Prof. Hall is of the opinion that the comet can be followed without great difficulty, even after the present moon.

EPHEMERIS—WASHINGTON MIDNIGHT.

1881	R. A. h. m. s.	Dec. ° ′
Jan. 11	6 0 26	+26 57.4
13	6 2 52	26 23.6
15	6 5 15	25 52 2
17	6 7 34	25 22.9
19	6 9 51	24 55 6
21	6 12 7	24 30.2
23	6 14 21	24 6.5
25	6 16 35	23 44 3
27	6 18 48	23 23 5
29	6 21 2	23 4 0
31	6 23 16	+22 45.8

WASHINGTON, D. C., January 8, 1881. W. C. W.

ECLIPSE OF THE SUN.

The partial eclipse of the Sun which occurred on December 31, 1880, was observed with the spectroscope at my private observatory.

For this purpose, the instrument was so adjusted that it would present its slit radially to the limb of the Moon; and the C line was placed in the centre of the field, in order to see any solar protuberance that might be at the place of observation.

At about the time of greatest obscuration, the slit was directed on the Moon's limb outside of the Sun, at some distance from its western cusp. Although the limb of the Moon was absolutely invisible in the telescope outside of the Sun, as ascertained before, yet, the presence of the satellite was immediately made known in the spectroscope, where it gave a very distinct broad grayish band spectrum, running along the brighter spectrum of the vicinity of the Sun.

The phenomenon became more apparent the nearer the slit was moved towards the Sun, and it vanished from sight when it was at a distance estimated at 3 or 4 minutes from the solar limb.

As the eclipse drew nearer the end, the phenomenon became less and less conspicuous on the western side, and at about 9 o'clock it had almost entirely ceased.

An unsuccessful attempt was made to observe the phenomenon taking place at the point of last contact, when the Moon's limb left that of the Sun. For this purpose the slit of the instrument was placed radially to the point of emergence. But either because no phenomenon was perceptible, or perhaps rather because the slit was not exactly at the right place, nothing was seen.

If the dull spectrum obtained when the slit of the spectroscope was placed in the immediate vicinity of the Sun was due only to the solar light, which is reflected by our atmosphere, it is plain that this spectrum would have been as bright on the Moon as it was outside of it, since the terrestrial atmosphere lies as necessarily between the observer and the Moon as it does between us and the Sun, and therefore no dark band spectrum could have been seen. But as it was visible, it must be inferred that besides the spectrum given off by the solar light reflected by our atmosphere, there must have been some other light, either emitted or reflected, coming from a point situated beyond the Moon, which reinforced the spectrum given off by the solar light reflected by our atmosphere.

This light, undoubtedly, can be no other than that of the solar atmosphere, or Corona, visible during total eclipses of the Sun.

If this reasoning is sound, the conclusions to be drawn from these observations are that the Corona, or at least traces of it, was visible during this partial eclipse, and that it was much brighter in the northwest equatorial regions than it was in the East; and, furthermore, that in the West it was less and less brilliant as it was observed northward, until it was completely invisible in the northern regions of the Sun. L. TROUVELOT.

CAMBRIDGE, *December* 31, 1880.

JUPITER.

OBSERVATIONS OF THE GREAT RED SPOT.

Having devoted most of my observing time this year to the phenomenæ of Jupiter, I would respectfully submit a few observations of the great red spot, situated in the south temperate zone of the planet.

Up to December 14, (the last observation on account of cloudy weather,) I have observed forty transits of the red spot across the central meridian. Thirty-four of these have been complete transits, *i. e.*, the preceding end the middle and the following end being observed.

The following table contains twenty-nine of these transits and is given in Greenwich mean time. The first, third and fifth columns give the observed time of passage of the preceding end, the middle and the following end of the spot.

Columns two, four and six, contain the times by which each portion of the spot preceded the passage of an assumed meridian that has a rotation period of $9^h\ 55^m\ 27.^s08$ (an ephemeris of the transits of this meridian has been published at intervals in the *English Mechanic*, by Herr A. Marth of the Royal Astronomical Society, and is corrected for parallax, velocity of light and phase).

The last column (7) contains the duration of transit in minutes, that is, the interval between the passage of the *P* and *F ends*.

TRANSIT OF JUPITER'S GREAT RED SPOT.

GREENWICH m. t. 1880.	1 Transit of P. end.	2 Preceding Ass'd Meridian.	3 Transit of Middle.	4 Preceding Ass'd Meridian.	5 Transit of F. End.	6 Preceding Ass'd Meridian	7 Duration of Transit.
	h. m.	*h. m.*	*h. m.*	*h. m.*	*h. m.*	*m.*	*m.*
August 30	17 21.9	1 34.7	17 45.4	1 11.2	18 11.4	45.2	49.5
September 9	15 38.9	1 26.6	16 02.4	1 03.1	16 26.4	39.1	47.5
" 14	------	-----	15 14.4	55.4	------	----	----
" 16	16 19.4	1 27.2	16 49.4	57.2	17 11.4	35.2	52.0
" 18	18 01.4	1 22.0	18 24.9	58.5	18 50.4	33.0	49.0
" 25	18 45.0	1 19.5	19 09.7	54.9	19 32.3	32.2	47.3
" 28	16 15.5	1 16.5	16 40.1	51.9	17 03.9	28.1	48 4
" 30	17 51.5	1 17.3	18 19.5	49.3	18 44.0	24.9	52.5
October 1	13 44.3	1 15.2	14 12.0	47.5	14 39.0	20.5	54.7
" 6	12 48.7	1 15.1	13 16.7	47.1	13 44.7	19.1	56.0
" 7	18 32.2	1 17.7	19 00.2	49.7	19 27.0	22.9	54.8
" 10	16 00.7	1 16.7	16 26.7	50.7	16 55.7	21.7	55.0
" 13	13 31.2	1 13.8	13 57.2	47.8	14 23.0	22.0	51.8
" 20	14 16.0	1 10.5	14 40.0	46.5	15 03.8	22.7	47.8
" 22	------	-----	16 17.2	46.2	------	----	----
November 1	14 04.9	1 08 1	14 34.7	38.3	14 56.5	16.5	51.6
" 4	------	-----	12 01.0	39.9	12 25.2	15.7	----
" 8	14 52.0	1 03.3	15 16.7	38.5	15 43.1	12.2	51.1
" 10	16 30.2	1 02.2	16 55.0	37.5	17 19.4	13.0	49.2
" 11	12 20.1	1 03.2	12 42.9	40.4	13 11.2	12.1	51.1
" 18	13 03.2	1 02.8	13 28.0	40.0	13 54.8	11.4	51.4
" 20	14 44.2	59.1	15 08.7	34.6	15 34.0	9.4	49.8
" 22	16 25.9	54.8	16 47.2	33.5	17 15.5	5.2	49.6
" 23	12 18.2	53.4	12 39.5	32.1	13 06.2	5.4	48.0
December 2	14 42.9	49.5	15 02.2	30.2	15 27.9	4.5	45.0
" 5	12 12.9	48.1	12 32.2	28.8	12 57.2	3.8	44.3
" 7	13 46.5	52.0	14 10.0	28.5	------	----	----
" 9	15 24.9	50.2	15 49.3	25.8	16 12.7	2.4	47.8
" 14	14 33.2	49.3	14 56.0	26.5	15 21.4	1.1	48.2

The above table shows that the red spot varies considerably in length. These variations are shown in the last column, marked "Duration of Transit."