The experience of the past year led to the following conclusions:

a) When the planet has a large angular diameter and the horns are very thin, they are tremulous and difficult to see sharply. Errors of observation under such conditions are increased, and produce in the reduced diameter an effect just about equivalent (within a certain range) to that due to the errors which arise when the horns are thicker and the planet apparently smaller and more remote from the Earth.

b) The irradiation at the horns of the crescent is sensibly the same while the planet moves from East to West elongation; but in order that the horns may be sufficiently thin to be similarly affected by the state of our atmosphere, observations should not be taken when the planet is more than about ten weeks from inferior conjunction.

c) When the observations are confined to this period of five months about inferior conjunction, the horns of the

crescent are so thin that with accurate bisections the irradiation may be entirely disregarded. It has the wellknown effect of blunting the point of the crescent, enlarging it inwardly, and outwardly by about equal angular amounts, and if the centre of the micrometer wire be accurately placed on the point of the horn, it will be tangent to the true limb of the planet, without any correction for irradiation whatever.

In view of these considerations no correction for irradiation has been applied to the above diameter; and all the individual determinations of diameter have been given equal weight, except as affected by the state of the seeing. The arithmetical mean of the 32 measures is $16''.787$; the weighted mean increases this quantity but slightly, and we have, as above, $D = 16''.800 \pm 0''.022$. Using $8''.796$ for the Solar parallax, this concluded angular diameter, at distance unity, makes the absolute diameter of Venus 12181.7 ± 16 kilometers.

U. S. Naval Observatory, Washington, D. C., 1900 Sept. 4.

T. J. J. See.

Observations of Titania and Oberon, the two outer Satellites of Uranus, made with the 26 inch Refractor of the U. S. Naval Observatory, Washington.

By *T. J. J. See.*

The following observations of the satellites Titania and Oberon, have been secured with a power of 606, and the new Clark Micrometer II (which is provided with a suitable electric illumination) attached to the 26 inch Refractor.

In the present position of Uranus the satellites are generally quite faint, and can be successfully measured with this telescope only when the sky is clear, and the Moon in the first and fourth quarters. On two or three occasions glimpses were obtained of the two inner satellites, Ariel and Umbriel, but they were too faint to admit of reliable measurement.

In the following table each recorded angle and distance is the mean of ten settings of the Micrometer, unless the contrary is indicated in the notes. The angles were obtained by placing the wire through the satellite and the centre of the planet's disc, and adjusting the color and intensity of the illumination to suit the faintness of the satellites. The distances were obtained by the usual method of

bisecting the ball of Uranus. The seeing is estimated on a scale of 5.

Mr. George Anderson, Assistant on the Great Equatorial, has been ill a considerable part of the time covered by these observations, and Mr. Geo. H. Peters, the Photographer, has voluntarily aided in the work on the satellites. The corrections for differential refraction indicated in the tables have been computed by Mr. W. Walter Dinwiddie, and checked by the writer.

These observations indicate that the places given in the American Ephemeris and Nautical Almanac, based upon the tables computed by Professor Newcomb in 1874, are now about 37° in advance of the observed places. The difference is probably due to an error in the tabular mean motion. The development of such a difference in the last 25 years, indicates that these tables cannot be relied upon for accurate places at epochs so remote as the time of Herschel, and that further researches on these satellites might be advantageously undertaken.

Observations of Titania.

Washington M. T. 1900	p_o	Refr.	p_o'	Wash. M. T.	s_o	Refr.	s_o'	Seeing = wt.	Remarks
April 25 14 ^h 41 ^m 5	138.26	+0.03	138.29	14 ^h 41 ^m 7	32.75	+0.02	32.77	2-3	Suspect Ariel and Umbriel, but [cannot measure]
26 14 8.6	178.46	+0.00	178.46	14 10.2	32.52	+0.04	32.56	4	
May 5 15 36.6	193.60	+0.02	193.62	15 36.5	32.90	+0.02	32.92	3-4	Hazy and moist, satellite difficult Clouds troubling Hazy
9 15 7.2	358.98	+0.03	359.01	15 8.0	33.44	+0.05	33.49	1-3	
17 13 47.4	326.89	-0.03	326.86	13 49.0	33.22	+0.02	33.24	4	
20 12 17.0	178.10	+0.01	178.11	12 17.0	33.58	+0.03	33.61	3-4	
21 13 14.7	211.60	-0.02	211.58	13 14.5	33.25	+0.03	33.28	2	
30 11 8.3	140.58	+0.03	140.61	11 9.0	33.25	+0.02	33.27	3-4	
June 1 10 27.5	221.88	-0.02	221.86	10 28.5	33.17	+0.04	33.21	2	Hazy

Washington M. T. 1900		p_o	Refr.	p_o'	Wash. M. T.	s_o	Refr.	s_o'	Seeing = wt.	Remarks	
June	4 11 ^h 14 ^m .3	347.09	+0.01	347.10	11 ^h 15 ^m .0	33.58	+0.04	33.62	3	Fuzzy	
	5 11 36.1	28.85	-0.02	28.83	11 36.5	33.99	+0.04	34.03	4		
	6 11 54.5	71.22	-0.02	71.20	11 54.0	33.09	+0.03	33.12	4		
	7 11 57.4	113.70	+0.02	113.72	11 58.7	33.57	+0.01	33.58	4-5		
	8 11 43.9	153.66	+0.01	153.67	11 43.9	33.01	+0.01	33.02	3-4		
	19 9 12.9	244.54	-0.03	244.51	9 13.5	32.71	+0.03	32.74	2		
	20 10 25.8	288.00	+0.01	288.01	10 26.0	32.76	+0.03	32.79	2		
	23 11 7.3	54.65	-0.03	54.62	11 7.5	33.02	+0.04	33.06	3		
	24 10 35.3	94.75	+0.02	94.77	10 36.0	33.22	+0.02	33.24	2-3		
	30 9 33.0	339.85	+0.02	339.87	9 33.5	33.09	+0.03	33.12	2-1		
July	1 9 39.5	21.53	-0.00	21.53	9 39.0	32.79	+0.04	32.83	3-4	Only 8 settings for distance Hazy Blurred	
	2 9 19.8	62.61	-0.02	62.59	9 19.7	32.86	+0.02	32.88	3		
	15 9 10.7	240.04	-0.02	240.02	9 10.7	31.88	+0.02	31.90	4		
	16 9 12.6	281.02	+0.01	281.03	9 13.0	32.59	+0.01	32.60	4		
	17 9 19.3	321.97	+0.03	322.00	9 19.5	33.11	+0.02	33.13	4		
	27 8 34.1	15.08	-0.01	15.07	8 35.0	32.02	+0.04	32.06	4		
	28 8 30.1	56.64	-0.02	56.62	8 30.2	32.60	+0.02	32.62	3-4		
	30 8 20.7	137.84	-0.03	137.81	8 21.0	32.91	+0.02	32.93	3		
	31 8 19.7	179.84	+0.01	179.85	8 19.7	33.00	+0.03	33.03	3		
	Aug.	1 8 24.0	224.90	-0.02	224.88	8 28.5	32.59	+0.03	32.62		3
15 7 54.5		80.28	-0.02	80.26	7 54.7	32.42	+0.01	32.43	2-3		
18 7 56.2		202.91	-0.00	202.91	7 55.2	31.96	+0.04	32.00	2-3	Very hazy and difficult	
19 7 49.6		246.21	-0.03	246.18	7 50.0	31.42	+0.02	31.44	3		
25 7 40.3		132.29	+0.03	132.32	7 40.2	32.22	+0.01	32.23	5		
30 7 40.7		340.00	+0.04	340.04	7 40.2	32.15	+0.03	32.18	3-4		
31 7 39.1		20.10	+0.05	20.15	7 39.0	32.22	+0.05	32.27	1-2	Angles on seven settings	

Observations of Oberon.

Washington M. T. 1900		p_o	Refr.	p_o'	Wash. M. T.	s_o	Refr.	s_o'	Seeing = wt.	Remarks
April	25 15 ^h 8 ^m 5	140.00	+0.03	140.03	15 ^h 8 ^m 8	45.75	+0.03	45.78	2-3	Hazy and moist Satellite quite plain
	26 14 32.7	166.39	+0.02	166.41	14 34.2	44.64	+0.04	44.68	4	
May	5 15 10.4	48.00	-0.02	47.98	15 11.0	44.34	+0.05	44.39	3-4	
	9 15 30.7	245.38	-0.04	245.34	15 30.7	44.63	+0.05	44.68	1-3	
	17 13 23.8	6.68	-0.00	6.68	13 24.0	43.82	+0.05	43.87	4	
	20 12 31.8	176.03	+0.01	176.04	12 32.0	44.90	+0.05	44.95	3-4	
	21 13 27.5	204.48	-0.01	204.47	13 28.0	44.75	+0.05	44.80	3-4	Hazy Very hazy, satellite faint
	30 11 25.9	351.81	+0.02	351.83	11 26.5	44.76	+0.05	44.81	2-3	
June	1 10 41.0	45.31	-0.02	45.29	10 41.0	44.88	+0.05	44.93	1-2	[angle, 6 for distance Clouded over solid. 5 settings for Very much blurred
	4 11 30.3	126.57	+0.02	126.59	11 30.5	45.26	+0.05	45.31	3-4	
	5 11 47.8	153.38	+0.02	153.40	11 48.2	44.57	+0.05	44.62	4	
	6 12 2.2	180.22	+0.01	180.23	12 2.5	44.42	+0.04	44.46	4	
	7 12 9.0	207.53	-0.01	207.52	12 9.0	44.05	+0.05	44.10	4-5	
	8 12 1.1	233.24	-0.03	233.21	12 1.2	43.40	+0.05	43.45	2-3	
	19 9 29.5	165.16	+0.03	165.19	9 28.7	44.30	+0.03	44.33	2	
	20 10 37.4	192.60	-0.01	192.59	10 37.2	44.06	+0.05	44.11	2	
	23 11 15.5	274.46	-0.00	274.46	11 15.8	44.34	+0.05	44.39	3	
	24 10 55.0	300.64	+0.02	300.66	11 0.5	44.82	+0.05	44.87	2-1	
	30 9 47.4	100.47	+0.01	100.48	9 48.0	44.69	+0.01	44.70	2-1	
July	1 9 56.3	127.25	+0.02	127.27	9 57.0	44.32	+0.03	44.35	3-4	
	2 9 32.5	153.10	+0.02	153.12	9 32.5	44.74	+0.04	44.78	3	
	15 9 22.7	140.78	+0.03	140.81	9 22.2	44.55	+0.03	44.58	4	
	16 9 27.0	167.08	+0.02	167.10	9 27.2	43.65	+0.04	43.69	4	
	17 9 29.8	194.76	-0.00	194.76	9 29.8	43.73	+0.04	43.77	4	

Washington M. T. 1900	p_o	Refr.	p_o'	Wash. M. T.	s_o	Refr.	s_o'	Seeing = wt.	Remarks
July 27 8 ^h 46 ^m 9	101°36	+0°00	101°36	8 ^h 47 ^m 0	43°88	+0°01	43°89	3-4	
28 8 42.0	127.94	+0.02	127.96	8 42.2	44.14	+0.02	44.16	3-4	
30 8 36.0	180.92	-0.02	180.90	8 35.5	43.44	+0.03	43.47	3	
31 8 29.3	207.57	-0.01	207.56	8 29.0	43.34	+0.04	43.37	3-4	
Aug. 15 8 4.2	247.77	-0.03	247.74	8 5.0	42.58	+0.03	42.61	2	
18 8 8.4	326.95	+0.04	326.99	8 8.7	42.67	+0.03	42.70	2	Blurred and hazy
19 8 0.7	354.95	+0.03	354.98	8 1.0	43.02	+0.06	43.08	3	
25 7 48.7	156.50	+0.04	156.54	7 48.7	42.90	+0.02	42.92	5	
30 7 51.7	288.83	-0.00	288.83	7 51.7	41.47	+0.01	41.48	3-4	
31 7 50.6	314.23	+0.03	314.26	7 51.0	42.22	+0.02	42.24	2-3	

U. S. Naval Observatory, Washington, D. C., 1900 Oct. 4.

T. J. J. See.

Observations of Enceladus

made with the 26 in. Refractor of the Leander Mc Cormick Observatory of the University of Virginia.

By *Herbert R. Morgan.*

In the following, each angle is the mean of eight measures, and each distance is the mean of four double distance measures.

1900	Eastern M. T.	p	Eastern M. T.	s
Enceladus-Tethys.				
June 21	11 ^h 22 ^m 15 ^s	206°93	11 ^h 20 ^m 23 ^s	9"20
July 2	11 35 6	130.92	11 36 29	40.30
4	10 40 9	252.89	10 39 43	53.27
6	9 41 6	143.19	9 40 57	9.13
27	10 21 1	253.24	10 26 2	48.20
30	9 54 54	151.54	9 55 29	16.76
Aug. 28	8 5 33	88.15	8 5 6	65.10
Enceladus-Dione.				
July 2	10 57 15	339.52	10 58 35	16.75
4	11 38 28	260.55	11 39 46	74.55
13	9 16 31	339.64	9 16 16	18.63

1900	Eastern M. T.	p	Eastern M. T.	s
July 27	9 ^h 24 ^m 9 ^s	359°24	9 ^h 23 ^m 10 ^s	9"65
30	9 18 6	347.79	9 17 35	14.84
Aug. 28	8 42 15	90.73	8 42 58	79.10
Enceladus-Rhea.				
July 2	12 15 52	91.42	12 17 0	107.78
6	10 17 38	59.84	10 18 6	70.22
13	10 0 45	204.73	10 1 14	32.26
27	10 57 44	259.22	11 0 12	84.61
30	10 31 22	146.17	10 36 13	37.74
Aug. 28	9 20 39	103.43	9 21 55	106.19
31	9 9 19	125.45	9 11 46	35.16

Zweite Elemente des Veränderlichen 2.1900 Cygni.

BD. +46°2966 = AG. Bonn 14384.

Von Prof. *Deichmüller.*

In Nr. 3637 der Astr. Nachr. habe ich auf Grund meiner ersten Maximumbestimmungen erste Elemente dieses Sterns mitgeteilt, die meine seitdem regelmässig fortgesetzten Beobachtungen bestätigt und bereits als so genau erwiesen haben, dass sie auch jetzt noch die Erscheinungen sehr nahe darstellen. Da bisher Beobachtungen der Maxima von anderer Seite nicht vorliegen, so können zu einer Verbesserung meiner ersten Elemente nur die von mir seitdem beobachteten 9 Maxima zu Grunde gelegt werden, die zusammen mit den früher (A. N. 3637) von mir mitgetheilten, sehr gut dargestellt werden durch die neuen

Elemente (2): Maximum 8^m7 1900 Sept 15.6. + 15^d08 E

die eine Uebereinstimmung der Periodenlänge innerhalb zweier Stunden mit meinen ersten Elementen aufweisen. Eine Abweichung von der Constanz der Periode ist in meinen Beobachtungen nicht angedeutet. Eine solche, oder eine kleine positive Correction der Periode, wie sie zum Theil einige photographische und visuelle Beobachtungen von Mr. Stanley Williams (A. N. 3629) andeuten, die erst durch eine willkürliche Correction im Betrage von $\frac{1}{4}$ der ganzen Phasenweite des Sterns gleichartig gemacht sind, kann daher noch nicht abgeleitet werden.

Längere Zeit nach meiner ersten Bestimmung hat auch Herr Director Hartwig (A. N. 3652) die von mir mitgetheilten