

Ephemeris of Psyche for the opposition in 1867.

By *E. Schubert*.(Communicated by Prof. *J. Winlock*, Superintendent of the American Nautical Almanac.)12^h Washington Mean Time.

	α			δ			$\log \Delta$			$\log r$	
Jan. 28	10 ^h 34 ^m 7 ^s .25	-36° 02'	-0° 99'	+ 8° 51' 13".1	+4' 19".0	+6".3	0,35374	-112	+4	0,49998	+27
29	33 31,23	37,01	0,95	55 32,1	4 25,3	5,6	35262	108	5	50025	28
30	32 54,22	37,96	0,90	8 59 57,4	4 30,9	5,3	35154	103	5	50053	27
31	32 16,26	38,86	0,87	9 4 28,3	4 36,2	5,0	35051	98	5	50080	27
Febr. 1	31 37,40	39,73	0,83	9 4,5	4 41,2	4,6	34953	93	5	50107	27
2	30 57,67	40,56	0,78	13 45,7	4 45,8	4,4	34860	88	6	50134	27
3	30 17,11	41,34	0,76	18 31,5	4 50,2	4,3	34772	82	6	50160	26
4	29 35,77	42,10	0,70	23 21,7	4 54,5	3,8	34690	77	6	50187	26
5	28 53,67	42,80	0,67	28 16,2	4 58,3	3,6	34613	71	5	50213	26
6	28 10,87	43,47	0,61	33 14,5	5 1,9	3,4	34542	66	6	50239	26
7	27 27,40	44,08	0,58	38 16,4	5 5,3	2,9	34476	60	5	50265	26
8	26 43,32	44,66	0,54	43 21,7	5 8,2	2,6	34416	55	6	50291	26
9	25 58,66	45,20	0,48	48 29,9	5 10,8	2,4	34361	49	6	50317	25
10	25 13,46	45,68	0,43	53 40,7	5 13,2	2,2	34312	43	6	50342	25
11	24 27,78	46,11	0,40	9 58 53,9	5 15,4	1,8	34269	37	6	50368	25
12	23 41,67	46,51	0,34	10 4 9,3	5 17,2	1,5	34232	31	5	50393	24
13	22 55,16	46,85	0,29	9 26,5	5 18,7	1,1	34201	26	6	50418	24
14	22 8,31	47,14	0,25	14 45,2	5 19,8	0,8	34175	20	6	50443	24
15	21 11,17	47,39	0,20	20 5,0	5 20,6	0,6	34155	14	7	50467	24
16	20 33,78	47,59	0,15	25 25,6	5 21,2	+0,3	34141	7	5	50492	24
17	19 46,19	47,74	0,12	30 46,8	5 21,5	-0,1	34134	2	6	50516	24
18	18 58,45	47,86	0,05	36 8,3	5 21,4	0,3	34132	+	4	50540	24
19	18 10,59	47,91	-0,01	41 29,7	5 21,1	0,8	34136	11	5	50564	24
♂ 20	17 22,68	47,92	+0,04	46 50,8	5 20,3	1,0	34147	16	6	50588	23
21	16 34,76	47,88	0,09	52 11,1	5 19,3	1,3	34163	22	7		
22	15 46,88	47,79	0,14	10 57 30,4	5 18,0	1,5	34185	29	5		
23	14 59,09	47,65	0,18	11 2 48,4	5 16,5	1,8	34214	34	6		
24	14 11,44	47,47	0,22	8 4,9	5 14,7	2,2	34248	40	6		
25	13 23,97	47,25	0,29	13 19,6	5 12,5	2,3	34288	46	6		
26	12 36,72	46,96	0,34	18 32,1	5 10,2	2,7	34334	52	6		
27	11 49,76	46,62	0,37	23 42,3	5 7,5	3,0	34386	58	5		
28	11 3,14	46,25	0,42	28 49,8	5 4,5	3,2	34444	63	6		
March 1	10 16,89	45,83	0,49	33 54,3	5 1,3	3,6	34507	69	6		
2	9 31,06	45,34	0,52	38 55,6	4 57,7	3,8	34576	75	6		
3	8 45,72	44,82	0,57	43 53,3	4 53,9	4,1	34651	81	5		
4	8 0,90	44,25	0,62	48 47,2	4 49,8	4,3	34732	86	5		
5	7 16,65	43,63	0,66	53 37,0	4 45,5	4,5	34818	91	5		
6	6 33,02	42,97	0,69	11 58 22,5	4 41,0	4,7	34909	96	6		
7	5 50,05	42,28	0,74	12 3 3,5	4 36,3	5,0	35005	102	5		
8	5 7,77	41,54	0,79	7 39,8	4 31,3	5,2	35107	107	6		
9	4 26,23	40,75	0,82	12 11,1	4 26,1	5,3	35214	113	4		
10	3 45,48	39,93	0,85	16 37,2	4 20,8	5,5	35327	117	5		
11	3 5,55	39,08	0,90	20 58,0	4 15,3	5,8	35444	122	4		
12	2 26,47	38,18	0,93	25 13,3	4 9,5	5,9	35566	126	5		
13	1 48,29	37,25	0,97	29 22,8	4 3,7	6,0	35692	131	4		
14	1 11,04	36,28	1,00	33 26,5	3 57,8	-6,2	35823	136	4		
15	10 0 34,76	35,28	+1,02	37 24,3	3 51,8		35959	140	+		
16	9 59 59,48	-34,26		41 16,1	+3 45,6		36099	+144	+		
17	9 59 25,22			+12 45 1,7			0,36243			0,50611	

♂ February 20, 14^h 52^m 2 Washington Mean Time. Intensity of light = 0,65.

OSCULATING ELEMENTS.

1867 February 21,0 Washington Mean Time.

$$\begin{aligned}
 M &= 125^{\circ} 28' 3'' 3 \\
 \pi &= 15 \ 27 \ 0,2 \\
 \Omega &= 150 \ 33 \ 23,1 \\
 i &= 3 \ 3 \ 58,4 \\
 \varphi &= 7 \ 47 \ 1,9 \\
 \mu &= 709'' 7709 \\
 \log a &= 0,465925.
 \end{aligned}
 \left. \vphantom{\begin{aligned} M \\ \pi \\ \Omega \\ i \\ \varphi \\ \mu \\ \log a \end{aligned}} \right\} \text{M. Eq. Ep.}$$

On this occasion I take the liberty of remarking that, after getting through with the work on my eight asteroids for 1867 and having then gained a good deal of time, I shall take up another asteroid for tabulation, and with the consent of Prof. *Winlock* I have chosen *Harmonia*. I thought it advisable to make this my intension public since some other astronomer might think of undertaking the same work.

E. Schubert.

Schreiben des Herrn Dr. B. A. Gould an den Herausgeber.

Since beginning to write, I have received the A.N. 1532-36, containing the valuable tables of Dr. *Auwers*, for reducing the declinations of various catalogues to one fundamental system.

I cannot but admire the thoroughness and conscientious care with which Dr. *Auwers* has performed this important work; while it has added still another to the numerous examples of the oft-noticed fact that almost all investigations are likely to be independently duplicated, by different persons, impelled to them by different considerations.

For some years I have been engaged whenever opportunity permitted, in a similar discussion, both for the right ascensions and the declinations, and the work has already attained very extended dimensions. — It was originally begun for use in perfecting the positions of any Standard Star-list, but has been subsequently continued for the sake of completeness. — Although not yet finished, it contains a very full discussion of all the standard catalogues, and the work chiefly remaining is the adjustment of the various determinations to harmony with one another. As basis of comparison I have used *Argelander's* Abo Catalogue, reduced to your value of the nutation, and have omitted no effort to obtain general formulas, by which the various differences may be expressed. — The work, which had been laid aside for some months, was resumed only about a fortnight ago, and at this time I am engaged in endeavouring to reconcile the troublesome discordances between the corrections due to the southern catalogues when compared with *Argelander*, and when compared with each other.

It is manifest that here, as for most of the other catalogues terms depending upon the right ascension must be used to reduce the residuals to a minimum. Thus comparing *Johnson's* St-Helena Catalogue and *Henderson's* Cape Declinations with *Argelander*, we find a term in the declination, as follows: —

$$A-J = +0''44 \sin(\alpha + 71^{\circ}4)$$

$$A-H = -0''37 \sin(\alpha + 75^{\circ}5)$$

$$\text{whence } H-J = +0''81 \sin(\alpha + 73^{\circ}3)$$

but the direct comparison of these catalogues with each other gives for the corresponding term

$$H-J = +0''84 \sin(\alpha + 92^{\circ}1)$$

For the declinations of *Johnson's* reduction of Groombridge the term depending on the right ascension has a coefficient of 0''8 and the same term for the *Radcliffe* Observations is nearly as large, for a considerable part of the catalogue.

To reduce the declinations of the *Radcliffe* Catalogue I think that two formulas will be found most convenient. The use of the following

a) between $22\frac{1}{2}^{\text{h}}$ and 12^{h}

$$A-R = +0''69 - 0''49 \sin \delta - 0''73 \sin \alpha$$

b) between 12^{h} and $22\frac{1}{2}^{\text{h}}$

$$A-R = +0''80 - 0''49 \sin \delta + 0''15 \cos(4\alpha + 4^{\text{h}})$$

will reduce the sum of the squares of the residuals for 222 stars from 339,4 to 293,0.

My reduction and Catalogue of the stars observed by *d'Agelet* in 1783-85 has not yet left the printer's hands, although I had hoped to be able to send it to you a year ago. The *Memoirs* of our new National Academy, — one of which it forms, — are printed at the Government printing office in Washington, which has been so laden with work, on account of the war, that the delay ought not to be surprising, although a source of much regret. The Catalogue contains 6492 observations of 2904 stars. Among them are three observations of *Argelander's* star 1830 Groombridge; but none of any new planet which I have been able to recognize. Positions are given for 11 stars which do not appear to be now in the sky; but most of these are doubtless the offspring of some erroneous record, and not due to actual observations. I anticipate some improved determinations of proper motion from this catalogue, not only for these stars (about 1475) which were not observed by *Bradley*, but perhaps also for some of those which also occur in the *Fundamenta Astronomiae*.

B. A. Gould.