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# IRIS.

*Ephemeris at her Reappearance*, 1848. By Mr. Hind.

" The following ephemeris of this planet up to November 11, is founded upon elements calculated from the observations at Mr. Bishop's Observatory on August 13, 1847; Dr. Wichmann's with the Königsberg Heliometer, on November 7; and Professor Challis' latest observation, 1848, February 17. The observed positions were corrected for aberration and parallax; but the effect of planetary perturbations on the geocentric place during the interval, being very minute, has been neglected.

Epoch 1847, August 1·0, Greenwich Mean Time.

| | | | | | |
|---|---|---|---|---|---|
| | | ° | ′ | ″ | |
| Mean Longitude of *Iris* | ..... | 331 | 24 | 20·57 | M.E. Aug. 1. |
| $\varpi$ | ..... | 41 | 31 | 19·71 | |
| $\Omega$ | ..... | 259 | 44 | 45·91 | |
| $i$ | ..... | 5 | 28 | 15·26 | |
| $\varphi$ | ..... | 13 | 19 | 59·98 | |
| Log $a$ | ..... | | | 0·3772589 | |
| $\mu$ | ..... | | | 964″·091333 | |

" These elements represent the middle declination exactly, and give the right ascension too small by 0″·8. On comparing them with the latest observation which I have yet seen, viz. Professor Kaiser's on March 14, (published in a recent number of the Society's *Monthly Notices*), I find the following errors:—

$$\text{Cos.}\,\delta \times \Delta\alpha = -2''\cdot37 \qquad \Delta\delta = -5''\cdot11$$

" These differences being so very small, it appeared to me probable that any attempt to correct the orbit from a combination of the observations during the first apparition of *Iris* only, would hardly repay the trouble that must necessarily be expended upon it. I have therefore delayed the final investigation until after the next appearance of the planet. The two oppositions can then be connected, and the elements resulting from a discussion of all the observations will no doubt be sufficiently exact to form the basis for ephemerides for some time to come.

" Assuming, therefore, that the orbit just given applies to Greenwich mean noon of 1847, August 1, I have calculated the perturbations produced by *Venus*, the *Earth*, *Mars*, *Jupiter*, and *Saturn*, between this date and 1849, February 3, (nearly the epoch of opposition), employing the same values for the masses as are now adopted by Encke in his investigations on the comet which bears his name; their logarithms are,—

| | |
|---|---|
| Venus ..... | 4·39595 |
| Earth and Moon ..... | 4·44916 |
| Mars ..... | 3·5718 |
| Jupiter ..... | 6·97969 |
| Saturn ..... | 6·45573 |

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" The united effects of these planets, between 1847, August 1, and 1849, February 3, are,—

$$\int d\alpha = +0{\cdot}00053771$$
$$\int de = +0{\cdot}000302365$$
$$\int d\pi = +\ 295''{\cdot}282$$
$$\int dL = +\ 146\ {\cdot}486$$
$$\int d\Omega = -\ 76\ {\cdot}789$$
$$\int di = -\ 7\ {\cdot}232$$

" For the ephemeris subjoined the true elements were obtained for every 24th day, and interpolated with 4th differences, where sensible, for every 8th day. The geocentric places so obtained were interpolated with 4th differences for each day. For the sake of brevity the elements of the variable ellipse are here given for the extreme dates of the ephemeris only :—

| | Aug. $7^d{\cdot}0$ | Nov. $11^d{\cdot}0$ |
|---|---|---|
| | ° ′ ″ | ° ′ ″ |
| M | 29 28 26·64 | 55 9 7·09 |
| $\pi$ | 41 35 29·24 | 41 36 55·13 |
| $\Omega$ | 259 45 41·02 | 259 45 51·44 |
| $i$ | 5 28 14·30 | 5 28 11·39 |
| $\varphi$ | 13 20 0·25 | 13 20 33·03 |
| Log. $\mu$ | 2·9841593 | 2·9840273 |

" The longitudes are referred to the apparent equinox of date; corrections being applied for diminution of obliquity, &c. The ephemeris contains the position of the planet, for the apparent equinox and equator of each date, unaffected with aberration; consequently, before comparing with apparent places, it will be necessary to subtract the time given in the last column from the mean time of observation.

## *Ephemeris.*

At Greenwich Mean Noon.

| 1848. | | R.A. ° ′ ″ | Decl. ° ′ ″ | Log. Δ | $497^s{\cdot}8 \times \Delta$ m s |
|---|---|---|---|---|---|
| August | 7 | 104 51 34·7 | +22 11 17·8 | 0·43794 | 22 44·6 |
| | 8 | 105 27 11·3 | 22 6 11·3 | | |
| | 9 | 106 2 40·5 | 22 0 57·2 | 0·43679 | 22 40·9 |
| | 10 | 106 38 2·0 | 21 55 35·4 | | |
| | 11 | 107 13 15·9 | 21 50 6·3 | 0·43560 | 22 37·2 |
| | 12 | 107 48 22·0 | 21 44 29·7 | | |
| | 13 | 108 23 20·2 | 21 38 45·9 | 0·43437 | 22 33·4 |
| | 14 | 108 58 10·5 | 21 32 54·8 | | |
| | 15 | 109 32 52·8 | 21 26 56·7 | 0·43310 | 22 29·4 |
| | 16 | 110 7 27·2 | 21 20 51·6 | | |
| | 17 | 110 41 53·3 | 21 14 39·6 | 0·43178 | 22 25·3 |
| | 18 | 111 16 11·4 | +21 8 20·8 | | |

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| 1848. | | R.A. | Decl. | Log. Δ | 497ˢ·8 × Δ |
|---|---|---|---|---|---|
| | | ° ′ ″ | ° ′ ″ | | m s |
| August | 19 | 111 50 21·0 | +21 1 55·4 | 0·43042 | 22 21·1 |
| | 20 | 112 24 22·3 | 20 55 23·3 | | |
| | 21 | 112 58 15·1 | 20 48 44·8 | 0·42900 | 22 16·7 |
| | 22 | 113 31 59·3 | 20 41 59·8 | | |
| | 23 | 114 5 35·0 | 20 35 8·6 | 0·42755 | 22 12·3 |
| | 24 | 114 39 2·0 | 20 28 11·1 | | |
| | 25 | 115 12 20·2 | 20 21 7·4 | 0·42604 | 22 7·7 |
| | 26 | 115 45 29·6 | 20 13 57·8 | | |
| | 27 | 116 18 29·9 | 20 6 42·2 | 0·42448 | 22 2·9 |
| | 28 | 116 51 21·2 | 19 59 20·9 | | |
| | 29 | 117 24 3·2 | 19 51 53·9 | 0·42288 | 21 58·0 |
| | 30 | 117 56 36·1 | 19 44 21·3 | | |
| | 31 | 118 28 59·6 | 19 36 43·3 | 0·42122 | 21 53·0 |
| Sept. | 1 | 119 1 13·7 | 19 28 59·9 | | |
| | 2 | 119 33 18·2 | 19 21 11·3 | 0·41951 | 21 47·9 |
| | 3 | 120 5 13·2 | 19 13 17·6 | | |
| | 4 | 120 36 58·5 | 19 5 18·8 | 0·41775 | 21 42·6 |
| | 5 | 121 8 34·3 | 18 57 15·0 | | |
| | 6 | 121 40 0·3 | 18 49 6·5 | 0·41594 | 21 37·2 |
| | 7 | 122 11 16·6 | 18 40 53·2 | | |
| | 8 | 122 42 23·1 | 18 32 35·3 | 0·41407 | 21 31·6 |
| | 9 | 123 13 19·7 | 18 24 12·9 | | |
| | 10 | 123 44 6·5 | 18 15 46·1 | 0·41215 | 21 25·6 |
| | 11 | 124 14 43·4 | 18 7 15·0 | | |
| | 12 | 124 45 10·3 | 17 58 39·7 | 0·41017 | 21 20·0 |
| | 13 | 125 15 27·2 | 17 50 0·3 | | |
| | 14 | 125 45 34·0 | 17 41 17·0 | 0·40814 | 21 14·0 |
| | 15 | 126 15 30·8 | 17 32 29·7 | | |
| | 16 | 126 45 17·4 | 17 23 38·7 | 0·40605 | 21 7·9 |
| | 17 | 127 14 54·0 | 17 14 44·0 | | |
| | 18 | 127 44 20·3 | 17 5 45·7 | 0·40390 | 21 1·7 |
| | 19 | 128 13 36·3 | 16 56 44·0 | | |
| | 20 | 128 42 41·8 | 16 47 38·9 | 0·40170 | 20 55·3 |
| | 21 | 129 11 36·8 | 16 38 30·7 | | |
| | 22 | 129 40 21·2 | 16 29 19·4 | 0·39944 | 20 48·8 |
| | 23 | 130 8 55·0 | 16 20 5·2 | | |
| | 24 | 130 37 17·9 | 16 10 48·0 | 0·39712 | 20 42·1 |
| | 25 | 131 5 30·1 | 16 1 28·1 | | |
| | 26 | 131 33 31·2 | 15 52 5·5 | 0·39473 | 20 35·3 |
| | 27 | 132 1 21·3 | 15 42 40·3 | | |
| | 28 | 132 29 0·2 | 15 33 12·8 | 0·39229 | 20 28·4 |
| | 29 | 132 56 28·3 | 15 24 42·9 | | |
| | 30 | 133 23 44·9 | 15 14 10·9 | 0·38978 | 20 21·3 |
| Oct. | 1 | 133 50 50·2 | +15 4 36·9 | | |

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| 1848. | | R.A. | Decl. | Log. Δ | 497ˢ·8 × Δ |
|---|---|---|---|---|---|
| | | o ′ ″ | o ′ ″ | | m s |
| Oct. | 2 | 134 17 44·0 | +14 55 0·9 | 0·38720 | 20 14·1 |
| | 3 | 134 44 26·3 | 14 45 23·2 | | |
| | 4 | 135 10 56·9 | 14 35 43·7 | 0·38456 | 20 6·7 |
| | 5 | 135 37 16·0 | 14 26 2·6 | | |
| | 6 | 136 3 23·2 | 14 16 20·1 | 0·38187 | 19 59·7 |
| | 7 | 136 29 18·8 | 14 6 36·1 | | |
| | 8 | 136 55 2·6 | 13 56 50·9 | 0·37910 | 19 51·7 |
| | 9 | 137 20 34·5 | 13 47 4·5 | | |
| | 10 | 137 45 54·4 | 13 37 17·0 | 0·37628 | 19 43·9 |
| | 11 | 138 11 2·4 | 13 27 28·5 | | |
| | 12 | 138 35 58·3 | 13 17 39·2 | 0·37339 | 19 36·1 |
| | 13 | 139 0 42·1 | 13 7 49·2 | | |
| | 14 | 139 25 13·6 | 12 57 58·6 | 0·37044 | 19 28·1 |
| | 15 | 139 49 32·8 | 12 48 7·5 | | |
| | 16 | 140 13 39·5 | 12 38 16·1 | 0·36741 | 19 20·0 |
| | 17 | 141 37 33·6 | 12 28 24·4 | | |
| | 18 | 141 1 15·0 | 12 18 32·5 | 0·36432 | 19 11·8 |
| | 19 | 141 24 43·6 | 12 8 40·5 | | |
| | 20 | 141 47 59·4 | 11 58 48·6 | 0·36117 | 19 3·5 |
| | 21 | 142 11 2·0 | 11 48 56·9 | | |
| | 22 | 142 33 51·4 | 11 39 5·5 | 0·35795 | 18 55·0 |
| | 23 | 142 56 27·4 | 11 29 14·7 | | |
| | 24 | 143 18 50·0 | 11 19 24·3 | 0·35465 | 18 46·4 |
| | 25 | 143 40 58·9 | 11 9 34·9 | | |
| | 26 | 144 2 54·0 | 10 59 46·1 | 0·35129 | 18 37·7 |
| | 27 | 144 24 35·1 | 10 49 58·4 | | |
| | 28 | 144 46 2·0 | 10 40 11·8 | 0·34785 | 18 28·9 |
| | 29 | 145 7 14·6 | 10 30 26·5 | | |
| | 30 | 145 28 12·7 | 10 20 42·5 | 0·34436 | 18 20·0 |
| | 31 | 145 48 56·3 | 10 11 0·0 | | |
| Nov. | 1 | 146 9 25·1 | 10 1 19·2 | 0·34079 | 18 11·0 |
| | 2 | 146 29 39·1 | 9 51 40·1 | | |
| | 3 | 146 49 38·1 | 9 42 2·8 | 0·33716 | 18 2·0 |
| | 4 | 147 9 22·0 | 9 32 27·5 | | |
| | 5 | 147 28 50·5 | 9 22 54·2 | 0·33346 | 18 52·8 |
| | 6 | 147 48 3·7 | 9 13 23·2 | | |
| | 7 | 148 7 1·3 | 9 3 54·5 | 0·32970 | 17 43·6 |
| | 8 | 148 25 43·2 | 8 54 28·4 | | |
| | 9 | 148 44 9·2 | 8 45 4·9 | 0·32587 | 17 34·2 |
| | 10 | 149 2 19·2 | 8 35 44·3 | | |
| | 11 | 149 20 13·1 | +8 26 26·4 | 0·32197 | 17 24·8 |

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