

THE ORBIT OF THE SPECTROSCOPIC BINARY H.D. 1826

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THE star H.D. 1826, $\alpha(1900) 00^h 17^m.6$, $\delta(1900) +28^\circ 56'$, vis. mag. 6.89, type A5, was announced as a binary in D.D.O. Publications, Vol. I, No. 3. Forty-four plates given in Table I have been made the basis of a least-squares solution for the orbital elements. The spectrum is characterized by many fine well-defined metallic lines ; 39 lines were used in all. The wave-lengths based on the system given in the reference above were corrected to give a zero residual for each line.

TABLE I

J.D. 242	V_0 Km./sec.	Phase from final T	V_c Km./sec.	$V_0 - V_c$ Km./sec.
8036.806	+28.1	1.290	+27.8	+ 0.3
379.865	-07.4	2.892	- 7.7	+ 0.3
412.768	-28.6	2.963	-18.0	-10.6
776.806	+38.0	2.560	+25.4	+12.6
9188.654	-26.6	0.719	-26.6	0.0
89.696	+51.4	1.761	+55.4	- 4.0
91.644	-49.2	0.426	-47.0	- 2.2
97.630	-34.8	3.129	-33.7	- 1.1
99.626	+53.9	1.841	+57.0	- 3.1
9200.614	-04.0	2.830	- 3.3	- 0.7
02.619	+49.1	1.551	+46.6	+ 2.5
03.615	+20.2	2.547	+27.0	- 6.8
06.619	+48.2	2.268	+47.7	+ 0.5
07.582	-46.3	3.231	-41.5	- 4.8
09.603	+53.7	1.969	+57.6	- 3.9
12.584	+52.8	1.667	+52.2	+ 0.6
13.585	+14.7	2.668	+14.3	+ 0.4
14.555	-48.4	0.354	-48.4	0.0
17.576	-48.8	0.092	-48.9	+ 0.1
18.563	+05.9	1.079	+08.3	- 2.4
23.595	+01.8	2.828	- 2.8	+ 4.6

TABLE I—continued

J.D. 242	V ₀ Km./sec.	Phase from final T	V _c Km./sec.	V ₀ -V _c Km./sec.
26.557	+30.3	2.507	+30.5	- 0.2
28.547	+17.5	1.213	+21.0	- 3.5
30.533	-40.5	3.200	-39.5	- 1.0
34.527	-37.3	0.627	-34.4	- 2.9
47.571	-41.4	0.538	-40.7	- 0.7
52.524	+50.9	2.208	+51.0	- 0.1
9496.818	-46.8	0.258	-50.8	+ 4.0
500.751	+07.3	0.908	-08.6	+15.9
02.804	-13.4	2.958	-17.2	+ 3.8
03.848	-37.3	0.721	-26.4	-10.9
09.781	-42.0	0.088	-48.8	+ 6.8
10.769	+07.4	1.076	+ 7.9	- 0.5
12.803	-31.9	3.110	-39.5	+ 7.6
24.752	+61.6	1.926	+57.7	+ 3.9
30.785	+24.0	1.393	+36.0	-12.0
38.694	-05.4	2.735	+07.0	-12.4
40.700	+37.8	1.458	+40.8	- 3.0
56.628	+01.6	0.970	- 2.8	+ 4.4
68.624	-30.0	3.116	-32.8	+ 2.8
87.639	+45.4	2.431	+36.9	+ 8.5
92.568	-31.7	0.794	-19.7	-12.0
96.461	+51.1	1.403	+36.8	+14.3
9602.473	-04.5	0.849	-13.5	+ 9.0

The observations given in Table I were first plotted on a single cycle and reduced to 29 normal places. A preliminary orbit was then obtained by a graphical method and the residuals left treated by the method of least squares to give the final elements given below. All six elements are included in the solution.

FINAL ELEMENTS

Period	$P = 3.28325$ days	$\pm .000029$
Eccentricity	$e = .056$	$\pm .016$
Angle of periastron	$\omega = 151^\circ .63$	± 21.5
Date of periastron	$T = \text{J.D. } 2429191.218$	$\pm .194$
Velocity of system	$\gamma = +5.90$ km.	± 0.66
Semi-amplitude	$K = 54.49$ km.	± 0.96
$a \sin i$	$= 2,460,000$ km.	
$\frac{m_1^3 \sin^3 i}{(m_1 + m)^2}$	$= .055 \odot$	

Figure 1 shows a plot of the individual observations. The residuals in Table I yield a probable error of a single plate 3.9 km.

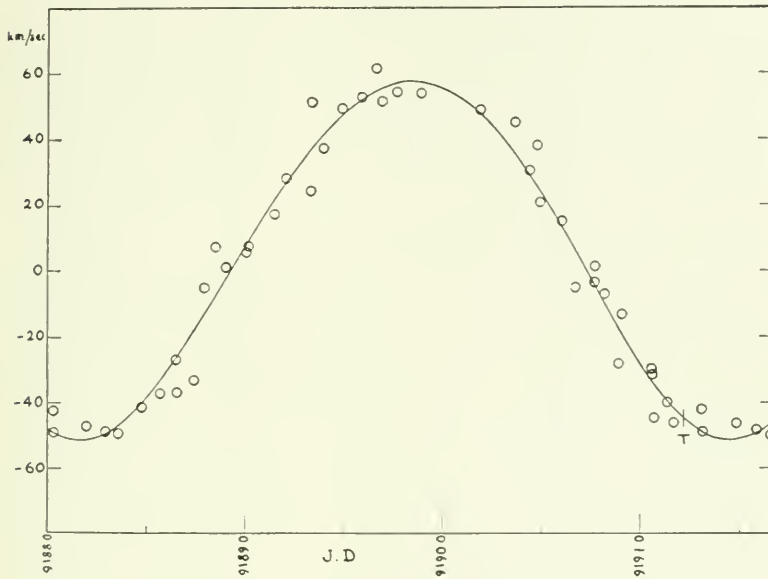


FIG. 1. Radial Velocity Curve of H.D. 1826