RADIAL VELOCITIES OF CEPHEID VARIABLE STARS*

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ABSTRACT

Uniform radial-velocity determinations have been made for 128 variable stars of the δ Cephei type with periods from 1.5 to 45 days. With low-dispersion spectrographs the observations have been extended to the fourteenth photographic magnitude. Tests for systematic errors were made by comparing results for stars having similar spectra with Lick determinations.

Velocity-curves were drawn for 106 stars. From these curves the normal velocity, range, and certain characteristic features were deduced. Incomplete data were also obtained for 22 additional stars. Diagrams were plotted showing the relationship between period and certain properties of the stars such as light- and velocity-range, shape of the curves, and lag of the velocity-curve at maximum and minimum of light.

Radial-velocity determinations for variable stars of the δ Cephei type are of especial value for extending our knowledge of the activities taking place in the atmospheres of unstable stars as well as for obtaining data concerning the motions of distant stars and the movement of the galaxy as a whole. In general, Cepheids are situated close to the galactic plane and are well distributed in longitude.

The characteristics of individual velocity-curves of several of the brighter Cepheid variables have been known for a number of years through the results obtained, mostly at the Lick Observatory, from three-prism spectrograms. Previous to 1920 about a dozen stars had been observed in detail and the relationship of the light- and velocity-changes carefully studied.

In planning a comprehensive program of spectroscopic observation of stars of this type, it seemed advisable to survey the whole group down to the faintest limit of magnitude possible with the instruments available rather than to continue the practice of intensive observation of certain selected stars. It was hoped that ten, or even fewer, spectrograms of each star, if properly distributed in phase, would be sufficient to determine a reliable normal velocity for the star and give a first approximation to the form of its velocity-curve.

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Up to the present time spectrographic velocity-observations for 29 variable stars of the δ Cephei type have been published, exclusive of Polaris, which is peculiar in its behavior. They are as follows:

η Aql	DT Cyg	W Sgr
U Aql	β Dor	X Sgr
FF Aql	ζ Gem	Y Sgr
RT Aur	W Gem	RV Sco
l Car	T Mon	SZ Tau
SU Cas	S Mus	R TrA
TU Cas	S Nor	S TrA
δ Cep	Y Oph	T Vul
X Cyg	κ Pav	U Vul
SU Cyg	S Sge	

Twenty stars were observed at the Lick Observatory by 14 different observers, 12 at Mount Wilson, mostly by Sanford, 2 at Michigan, and 1 each at the Pulkowa and the Cape observatories. In a few cases observations were made at more than one observatory. The present investigation adds to this number 126 stars and leaves only 35 stars, mostly fainter than fourteenth magnitude, north of declination $-40°$ for which no observations are now available.

The observations and reductions have been kept as uniform as possible during the period of time involved. One-prism spectrographs were used, and the camera employed depended on the brightness of the star so that the exposure-times could be limited to three hours or less.

The spectra of Cepheids are known for their wide deep lines and for the presence of numerous strong lines of ionized atoms. These characteristics are especially favorable to the use of low dispersion. It was found that most of the lines used could be seen and readily measured on small-scale spectrograms, if attention was given to the proper exposure of the photographic plate. Although the observations of each star usually extended over several years, the resulting velocities, when sufficient in number, may be used to plot a mean velocity-curve, if the period is reasonably constant. It is necessary to depend upon the period of variation given by photometric observers. The photographic results, especially those of Robinson of the Harvard Observatory, have been used if available. In most cases preference has been given to elements based on data covering as long a

period of time as possible. A number of the elements are apparently in need of further observations for confirmation or revision.

In Table 1, data are listed concerning 106 stars for which the observations indicate the course of the velocity-curve. Table 2 contains similar data for 22 stars for which curves could not be drawn, either because of insufficient observations or because the agreement among the velocities was too poor to determine the curve. The phases are expressed as fractions of the period. The symbols "a," "b," and "c" in the sixth column indicate dispersions of approximately 35, 75, and 120 A per millimeter, respectively, at $H\gamma$. The estimated weight, given in the last column, is based on the dispersion and the quality of the plate. The radial velocities for each of the 106 stars are plotted against phase in Figures 1–18, and rough velocity-curves are drawn through the points with due consideration of the weight of the observations as given in the table.

The normal velocity for each curve was determined to the nearest half-kilometer per second by the method of equal areas and is indicated on the diagram by a dashed line. Light-curves from various sources, to which reference is made in Table 1, have been placed alongside for convenience in comparing certain features of the light- and velocity-variations.

On the assumption that the curves, as drawn, represent the true course of the velocity variations, the average unweighted residual is about 3 km/sec, and the probable error of the normal velocity for a star is of the order of 1.0 km/sec. Tests for systematic error were made by comparing with Lick Observatory results the velocities of 8 stars having constant velocity and Cepheid-like spectra. Fifty-five spectrograms were obtained with the shorter cameras at both the 60- and 100-inch telescopes and measured in the customary way. The results are shown in Table 3. The mean of the differences is ± 2.4 km/sec, and the systematic deviation -0.14 km/sec. Thirteen plates of δ Cephei may also be used for comparison with Jacobsen's curve, which is shown in Figure 6. The mean of the residuals is ± 3.4 km/sec, and the systematic difference (Mt. Wilson *minus* Lick) -0.3 km/sec. Similarly, 11 plates of T Vulpeculae give a mean residual of ± 3.3 km/sec and a systematic difference of -0.1 km/sec relative to Albrecht's curve.[1]

[1] *Lick Obs. Bull.*, **4**, 137, 1907.

TABLE 1

OBSERVATIONS OF CEPHEID VARIABLES FOR WHICH VELOCITY-CURVES ARE ILLUSTRATED

Plate	Date	JD*	Phase	Vel. Km/Sec	Disp.	Wt.
SZ Aquilae $18^h59^m35^s$, $+1°9'$†; 9.4–11.4 pg.						
Max. = JD 2420258.765 + $17^d.137939E$						
Elements and photographic light-curve by Robinson, *Harvard Bull.*, No. 872, 16, 1930.						
C 1241.....	1921 Aug. 20	2422922.701	0.441	+ 4.3	b	1.0
1361.....	Oct. 6	2969.641	.180	−20.8	a	1.5
3764.....	1926 Apr. 24	4630.993	.120	−22.7	b	1.0
4979.....	1928 Sept. 24	5514.706	.684	+34.7	b	0.3
γ 16703.....	1929 July 14	5807.844	.789	+36.8	b	0.7
C 5274.....	Aug. 18	5842.765	.827	+45.4	b	0.7
5284.....	Aug. 21	5845.802	.004	+ 9.4	b	1.0
γ 17575.....	1930 July 11	6169.868	0.913	+17.8	b	0.7
TT Aquilae $19^h3^m9^s$, $+1°8'$; 7.4–9.1 pg.						
Max. = JD 2420097.705 + $13^d.754980E$						
Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 49, 58, 1933.						
γ 7221.....	1918 Aug. 19	2421825.795	0.634	+18.4	b	1.0
8131.....	1919 May 7	2086.948	.620	+13.3	b	0.7
8164.....	May 12	2091.908	.980	−12.4	b	1.0
16036.....	1928 July 31	5459.788	.828	+26.0	a	0.5
16255.....	Oct. 28	5548.639	.288	− 9.3	b	1.0
16589.....	1929 May 20	5752.977	.144	−26.5	a	0.5
16754.....	July 23	5816.790	.783	+27.4	a	1.0
16759.....	July 24	5817.831	.858	+ 4.5	a	0.5
17488.....	1930 June 4	6132.985	.770	+26.1	b	1.0
17511.....	June 8	6136.976	0.061	−20.5	a	1.5
FM Aquilae $19^h4^m32^s$, $+10°24'$; 8.3–8.9 vis.						
Max. = JD 2425882.80 + $6^d.107E$						
Elements and visual light-curve by Lause, *Acta Astronomica*, Ser. c, **1**, 145, 1930. The period is doubtful.						
γ 18900.....	1932 June 19	2426878.977	0.120	−19.1	b	1.0
19028.....	Aug. 20	6940.809	.245	−29.2	b	1.0
C 6148.....	Oct. 10	6991.735	0.584	−18.3	c	0.6

* All Julian days refer to G.M.T.

† The epoch is 1900 in all cases.

TABLE 1—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
FM Aquilae—*Continued*						
γ 19564.....	1933 Apr. 2	2427165.004	0.956	+14.4	b	0.7
C 6275.....	July 14	7268.668	.931	− 1.9	b	0.7
6289.....	Aug. 29	7314.644	.459	−17.7	b	1.0
γ 20398.....	1934 May 21	7579.891	.893	+ 5.9	b	1.0
C 6437.....	June 19	7608.983	0.656	− 2.5	b	1.0
FN Aquilae $19^h7^m48^s$, $+3°23'$; 9.9–10.9 pg.						
Max. = JD 2425853.36 + $9^d.480E$						
Elements and photographic light-curve by Prager, *A.N.*, **243**, 360, 1931.						
γ 18914.....	1932 June 23	2426882.882	0.599	+30.0	b	1.0
C 6109.....	Aug. 23	6943.634	.008	+ 0.2	b	1.0
6114.....	Aug. 24	6944.632	.113	−14.1	b	1.0
γ 19116.....	Sept. 13	6964.659	.226	+ 4.6	b	1.0
19563.....	1933 Apr. 1	7164.962	.356	− 3.3	c	0.6
C 6244.....	May 14	7207.981	.893	+ 1.8	b	1.0
γ 20015.....	Nov. 2	7379.649	.002	+ 7.2	b	1.0
20774.....	1935 June 13	7967.910	.055	− 1.0	b	1.0
20777.....	June 14	7968.969	.166	− 7.9	b	1.0
20796.....	July 12	7996.924	.115	−21.8	c	0.4
20841.....	Oct. 20	8096.678	0.638	+18.2	c	0.6
PZ Aquilae $18^h50^m42^s$, $-3°1'$; 12.4–13.5 pg.						
Max. = JD 2426174.853 + $8^d.75546E$						
Elements by Harwood, *Harvard Bull.*, No. 893, 24, 1933. No light-curve available.						
C 6444.....	1934 June 22	2427611.858	0.127	−38.6	c	0.4
6513.....	Aug. 23	7673.719	.192	44.6	c	.4
6694.....	1935 June 10	7964.892	.448	21.3	c	.4
6750.....	July 8	7992.816	.638	17.0	c	.6
6754.....	July 9	7993.769	.746	26.0	c	.6
6943.....	1936 July 30	8380.726	0.942	−49.5	c	0.6
V 336 Aquilae $18^h56^m11^s$, $-0°1'$; 9.4–10.4 vis.						
Max. = JD 2427600.31 + $7^d.30765E$						
Elements from *A.N.*, **258**, 199, 1936. Visual light-curve by Beyer, *ibid.*, **258**, 276, 1936.						
γ 21004.....	1936 May 1	2428290.943	0.508	+27.7	c	0.6
C 6913.....	May 2	8291.950	.646	+28.8	c	.6
6920.....	May 27	8316.970	0.070	− 8.5	c	0.6

TABLE 1—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
V 336 Aquilae—*Continued*						
γ 21012	1936 May 31	248320.985	0.619	+45.8	c	0.4
21031	July 1	8351.757	.830	+ 1.3	c	.6
21034	July 7	8357.771	.653	+41.6	c	.6
C 6930	July 11	8361.691	.190	− 3.2	c	.6
6945	July 30	8380.905	0.819	+16.2	c	0.6

Y Aurigae $5^h21^m32^s$, $+42°21'$; 9.2–10.2 pg.

Max. = JD 2419866.903 + 3^d.859435 E

Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 46, 56, 1933.

C 4131	1926 Dec. 14	2424864.929	0.013	− 6.5	b	1.0
4135	Dec. 15	4865.882	.260	+ 6.8	b	1.0
4554	1927 Nov. 30	5215.874	.944	−12.7	b	0.3
4642	1928 Jan. 10	5256.829	.556	+14.2	b	1.0
4977	Sept. 23	5513.997	.189	− 0.8	b	1.0
5336	1929 Oct. 12	5897.000	.427	+22.4	b	1.0
5697	1931 Mar. 29	6430.667	.702	+21.8	b	1.0
6146	1932 Oct. 9	6990.006	0.629	+32.5	b	0.7

RX Aurigae $4^h54^m28^s$, $+39°49'$; 7.8–8.8 pg.

Max. = JD 2419698.357 + 11^d.623331 E

Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 46, 58, 1933.

γ 6451	1917 Dec. 5	2421568.795	0.921	−27.4	a	1.5
6514	Dec. 30	1593.938	.084	−29.5	a	1.0
6689	1918 Feb. 1	1626.689	.902	−28.0	a	1.5
6752	Mar. 21	1674.691	.032	−30.4	a	1.0
7622	Dec. 12	1940.946	.939	−25.6	a	1.5
7675	Dec. 19	1947.863	.534	−18.0	a	0.5
7767	1919 Jan. 14	1973.736	.760	−19.5	a	1.0
7796	Jan. 18	1977.757	.106	−27.4	a	1.5
14790	1927 Jan. 18	4899.679	.490	−19.1	b	1.0
C 4976	1928 Sept. 23	5513.940	.337	−23.4	b	1.0
γ 16259	Oct. 28	5548.951	.349	−24.9	b	1.0
17135	1929 Dec. 14	5960.853	.787	−15.1	b	1.0
C 5381	1930 Jan. 8	5985.816	.934	−32.1	b	1.0
5396	Feb. 11	6019.676	.847	−18.7	b	1.0
γ 17369	Apr. 8	6075.642	.662	−5.6	b	0.7
17374	Apr. 9	6076.633	.748	−9.7	b	1.0
C 5433	Apr. 11	6078.633	0.920	−27.6	b	1.0

TABLE 1—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
SY Aurigae $5^h5^m31^s$, $+42°42'$; 9.0–10.1 pg.						
Max. = JD 2419172.082 + $10^d.144890E$						
Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 46, 58, 1933.						
4130.....	1926 Dec. 14	2424864.859	0.147	− 3.5	b	1.0
4150.....	Dec. 19	4869.918	.646	+12.6	b	1.0
4184.....	1927 Feb. 8	4920.785	.660	+ 5.7	b	0.3
4443.....	Oct. 5	5159.938	.234	− 1.8	b	0.3
4641.....	1928 Jan. 10	5256.738	.775	− 9.1	b	1.0
4687.....	Feb. 27	5304.633	.496	+ 8.0	b	1.0
5071.....	Nov. 21	5572.847	.935	−13.6	b	1.0
5076.....	Nov. 22	5573.972	0.046	−10.4	b	1.0
YZ Aurigae $5^h8^m27^s$, $+39°58'$; 10.2–11.4 pg.						
Max. = JD 2420420.436 + $18^d.193225E$						
Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 46, 59, 1933.						
C 5081.....	1928 Nov. 25	2425576.979	0.432	−14.6	b	0.3
6136.....	1932 Sept. 13	6964.035	.672	+ 4.2	c	0.6
γ 19270.....	Nov. 10	7022.901	.908	−13.1	b	1.0
C 6602.....	1934 Dec. 15	7787.715	.946	−12.9	c	0.6
6625.....	1935 Feb. 11	7845.644	.130	−49.1	c	0.2
γ 20823.....	Oct. 9	8085.031	.288	−43.1	c	0.6
20859.....	Nov. 6	8113.953	0.878	−18.0	c	0.6
AN Aurigae $4^h52^m43^s$, $+40°41'$; 11.3–12.3 pg.						
Max. = JD 2421633.59 + $10^d.2908E$						
Elements by Oosterhoff, *Harvard Bull.*, No. 900, 10, 1935. Photographic light-curve by Parenago, *N.N.V.S.*, **4**, 151, 1933.						
C 6165.....	1932 Nov. 7	2427019.910	0.411	+19.9	c	0.6
6199.....	1933 Jan. 5	7078.667	.121	− 8.7	c	.6
6326.....	Oct. 27	7373.962	.816	−34.4	c	.6
6562.....	1934 Oct. 19	7730.894	.500	+ 0.1	c	.6
6591.....	Dec. 14	7786.796	.933	−24.1	c	.6
6969.....	1936 Sept. 25	8437.955	0.212	− 4.4	c	0.6

TABLE 1—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
AO Aurigae $5^h41^m14^s$, $+31°59'$; 10.9–12.6 pg.						
Max. = JD 2427193.08 + $6^d.76300E$						
Elements and photographic light-curve by Parenago, *N.N.V.S.*, **4**, 351, 1934.						
C 6604	1934 Dec. 15	2427787.868	0.947	− 7.9	c	0.4
6615	Dec. 17	7789.804	.234	−23.6	c	.4
6635	1935 Mar. 17	7879.799	.540	−15.1	c	.2
γ 20847	Oct. 21	8097.035	.662	− 2.1	c	.4
C 6835	1936 Feb. 2	8201.754	.146	−34.4	c	.4
γ 20971	Mar. 28	8256.741	.276	−25.8	c	.2
21078	Oct. 8	8450.007	.853	+ 9.4	c	.6
21080	Oct. 9	8451.017	0.003	−35.0	c	0.6
RW Camelopardalis $3^h46^m11^s$, $+58°21'$; 9.0–9.9 pg.						
Max. = JD 2420876.579 + $16^d.411760E$						
Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 46, 58, 1933.						
C 881	1921 Feb. 18	2422739.674	0.522	−19.5	b	0.7
4037	1926 Sept. 21	4780.956	.901	−25.4	b	0.7
4053	Oct. 19	4808.915	.605	+10.6	b	1.0
4149	Dec. 19	4869.828	.316	−52.1	b	1.0
4558	1927 Dec. 2	5217.759	.516	−20.2	b	1.0
5067	1928 Nov. 20	5571.917	.096	−49.0	b	1.0
γ 17102	1929 Nov. 20	5936.878	.334	−42.5	b	1.0
17730	1930 Sept. 3	6223.008	.768	− 5.6	b	0.7
C 5625	Dec. 1	6312.007	.191	−49.7	b	1.0
5651	Dec. 27	6338.847	.826	− 4.2	b	1.0
5905	1931 Nov. 2	6648.924	.720	+ 8.0	b	0.7
5941	1932 Jan. 16	6723.698	0.276	−34.4	b	0.7
RX Camelopardalis $3^h56^m42^s$, $+58°23'$; 8.2–9.3 pg.						
Max. = JD 2420359.763 + $7^d.911978E$						
Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 46, 58, 1933. Plate C4556, although of good quality, has not been used in drawing the velocity-curve.						
C 3963	1926 Aug. 19	2424747.994	0.631	−10.6	b	1.0
3985	Aug. 23	4751.008	.012	44.2	b	1.0
4048	Oct. 18	4807.992	.214	47.1	b	1.0
4054	Oct. 19	4808.966	.336	49.5	b	1.0
4556	1927 Dec. 1	5216.870	.893	57.5	b	1.0
4627	1928 Jan. 8	5254.739	.679	22.1	b	0.7
4972	Sept. 4	5494.016	.922	30.2	b	1.0
γ 16258	Oct. 28	5548.906	0.859	−20.3	b	1.0

TABLE 1—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
RX Camelopardalis—*Continued*						
C 5068.....	1928 Nov. 20	2425571.979	0.775	− 9.0	b	1.0
5131.....	1929 Feb. 26	5669.663	.122	42.9	b	1.0
5360.....	Dec. 9	5955.858	.294	56.5	b	1.0
5363.....	Dec. 10	5956.854	.420	50.9	b	1.0
5365.....	Dec. 11	5957.908	0.553	−31.2	b	1.0
RW Canis Majoris $7^h8^m47^s$, $-18°34'$; 10.6–11.4 vis.						
Max. = JD 2425234.31 + $5^d.7292E$						
Elements by Oosterhoff, *Harvard Bull.*, No. 900, 10, 1935. Visual light-curve by Florja, *N.N.V.S.*, **4**, No. 2, Tafel I, 1932.						
C 6221.....	1933 Mar. 3	2427135.706	0.878	+77.6	c	0.2
6345.....	Nov. 25	7402.978	.529	54.2	c	.4
6581.....	1934 Nov. 14	7756.941	.311	36.0	c	.2
6593.....	Dec. 14	7786.936	.547	57.5	c	.2
γ 20838.....	1935 Oct. 20	8096.026	.497	48.5	c	.2
C 6828.....	Dec. 7	8144.934	.033	37.9	b	.7
γ 20939.....	1936 Mar. 3	8231.705	0.179	+25.4	c	0.6
RY Canis Majoris $7^h11^m56^s$, $-11°18'$; 7.6–8.6 vis.						
Max. = JD 2426718.86 + $4^d.659E$						
Elements and visual light-curve by Lause, *A. N.*, **246**, 297, 1932. 1.4 days have been added to the epoch given to reduce it to maximum.						
γ 19400.....	1933 Jan. 3	2427076.826	0.823	+67.4	b	1.0
19565.....	Apr. 2	7165.637	.895	47.2	b	1.0
19998.....	Oct. 29	7375.984	.044	48.5	b	1.0
C 6381.....	1934 Mar. 20	7517.774	.478	34.5	c	0.6
γ 20677.....	Dec. 18	7790.906	.102	12.9	c	0.6
20685.....	1935 Jan. 15	7818.786	.086	22.4	b	1.0
20890.....	Dec. 8	8145.951	0.308	+20.4	c	0.6
SS Canis Majoris $7^h21^m58^s$, $-25°4'$; 9.9–10.7 vis.						
Max. = JD 2424916.21 + $12^d.3661E$						
Elements by Oosterhoff, *Harvard Bull.*, No. 900, 10, 1935. Visual light-curve by Florja, *N.N.V.S.*, **4**, No. 2, Tafel I, 1932.						
γ 19425.....	1933 Jan. 7	2427080.852	0.046	+57.4	c	0.6
19560.....	Apr. 1	7164.684	.826	68.1	c	.2
20269.....	1934 Mar. 22	7519.663	.531	60.6	c	.2
C 6592.....	Dec. 14	7786.858	.138	44.0	c	.6
γ 20946.....	1936 Mar. 4	8232.684	0.191	+53.2	c	0.4

TABLE 1—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
TV Canis Majoris $7^h4^m40^s$, $-13°37'$; 10.8–11.3 vis.						
Max. = JD 2426974.51 + $4^d.6693E$						
Elements by Florja, *Tashkent Circ.*, No. 15, 1933. No light-curve available. The period is uncertain.						
C 6205	1933 Feb. 4	2427108.705	0.740	+47.6	c	0.2
γ 20106	Dec. 27	7434.833	.585	51.0	b	.3
C 6396	1934 Apr. 20	7548.642	.959	13.3	c	.6
6611	Dec. 17	7789.009	.437	50.4	c	.2
γ 20863	1935 Nov. 8	8115.021	.257	46.8	c	.6
20896	1936 Jan. 6	8174.837	.068	33.5	c	.4
20947	Mar. 4	8232.726	0.466	+37.7	c	0.4
TW Canis Majoris $7^h17^m27^s$, $-14°7'$; 9.4–9.9 vis.						
Max. = JD 2426985.08 + $6^d.994E$						
Elements by Florja, *Tashkent Circ.*, No. 15, 1933. No light-curve available.						
γ 19424	1933 Jan. 7	2427080.781	0.683	+83.7	b	0.7
C 6404	1934 Apr. 22	7550.654	.866	61.7	c	.6
γ 20678	Dec. 18	7790.955	.224	64.5	c	.6
20686	1935 Jan. 15	7818.882	.217	60.4	c	.6
20745	Apr. 21	7914.646	.909	53.5	c	.6
20864	Nov. 8	8115.052	.563	83.5	c	.6
20935	1936 Mar. 2	8230.717	0.101	+45.8	c	0.6
RS Cassiopeiae $23^h32^m36^s$, $+61°52'$; 11.0–12.2 pg.						
Max. = JD 2419617.580 + $6^d.2955890E$						
Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 50, 57, 1933.						
C 4446	1927 Oct. 7	2425161.818	0.654	−15.4	b	0.3
4640	1928 Jan. 10	5256.646	.717	18.9	b	0.3
4969	Sept. 3	5493.830	.392	13.9	b	0.3
5338	1929 Oct. 14	5899.802	.877	13.1	b	1.0
5842	1931 Sept. 21	6606.882	.190	32.4	b	1.0
5849	Sept. 23	6608.738	.485	22.8	b	0.7
6084	1932 July 24	6913.914	.960	42.1	c	0.4
6111	Aug. 23	6943.880	.720	9.4	b	1.0
γ 19118	Sept. 13	6964.788	0.040	−47.6	b	1.0

TABLE 1—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
RW Cassiopeiae $1^h30^m43^s$, $+57°15'$; 9.5–10.7 pg.						
Max. = JD 2419651.941 + $14^d800676E$						
Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 46, 58, 1933.						
C 4166.....	1927 Jan. 13	2424894.752	0.228	−83.3	b	1.0
4392.....	Sept. 4	5128.001	.987	66.7	b	1.0
4993.....	1928 Sept. 27	5517.917	.332	59.7	b	1.0
5359.....	1929 Dec. 9	5955.712	.911	68.4	b	0.7
5923.....	1931 Dec. 17	6693.833	.782	42.6	c	0.3
γ 19121.....	1932 Sept. 14	6965.008	.104	97.1	b	1.0
C 6183.....	1933 Jan. 3	7076.684	0.649	−50.2	b	1.0
RY Cassiopeiae $23^h47^m10^s$, $+58°11'$; 9.3–10.5 vis.						
Max. = JD 2424502.724 + $12^d13819E$						
Elements and visual light-curve by Brun, *Bull. de l'association française d'obs. d'étoiles var.*, **1**, 121, 1932.						
C 4458.....	1927 Oct. 9	2425163.882	0.469	−56.4	b	0.3
4468.....	Oct. 11	5165.792	.627	49.8	b	1.0
4626.....	1928 Jan. 8	5254.659	.948	88.0	b	1.0
4998.....	Sept. 28	5518.869	.715	54.7	b	0.7
5529.....	1930 Sept. 3	6223.927	.801	73.3	b	0.7
5531.....	Sept. 5	6225.988	.970	82.2	b	0.3
5555.....	Sept. 19	6239.933	.119	90.5	b	0.7
5567.....	Oct. 6	6256.792	.508	47.3	c	0.6
5588.....	Oct. 30	6280.861	0.491	−62.2	b	0.3
SW Cassiopeiae $23^h2^m54^s$, $+58°1'$; 9.6–10.3 pg.						
Max. = JD 2419403.033 + $5^d441022E$						
Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 50, 57, 1933.						
C 4523.....	1927 Nov. 4	2425189.742	0.533	−33.7	b	1.0
4964.....	1928 Sept. 2	5492.928	.256	36.1	b	1.0
4975.....	Sept. 23	5513.861	.101	47.2	b	0.3
5599.....	1930 Nov. 2	6283.642	.580	24.9	b	1.0
5898.....	1931 Oct. 31	6646.767	.318	27.2	b	1.0
V 92.....	Nov. 1	6647.694	.489	36.5	a	0.5
γ 18916.....	1932 June 23	6882.990	.734	26.8	b	1.0
19030.....	Aug. 20	6940.942	.384	49.5	b	1.0
C 6108.....	Aug. 23	6943.000	.763	26.0	b	1.0
γ 19187.....	Oct. 11	6992.740	.904	48.6	b	1.0
C 6169.....	Nov. 8	7020.674	0.038	−54.0	b	1.0

TABLE 1—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
SY Cassiopeiae $0^h9^m51^s$, $+57°52'$; 9.3–10.1 pg.						
Max. = JD 2419336.475 + $4^d.070978E$						
Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 46, 56, 1933.						
C 4447	1927 Oct. 7	2425161.947	0.976	−57.6	b	1.0
4514	Nov. 2	5187.828	.333	47.6	b	1.0
4633	1928 Jan. 9	5255.673	.999	60.0	b	1.0
5282	1929 Aug. 20	5844.957	.751	27.0	b	0.3
5821	1931 Aug. 26	6580.955	.543	11.2	c	0.6
6091	1932 July 25	6914.983	.594	23.7	b	0.7
6314	1933 Sept. 30	7346.706	.643	21.1	c	0.6
6938	1936 July 28	8378.993	0.215	−59.8	c	0.4
SZ Cassiopeiae $2^h19^m55^s$, $+59°1'$; 10.6–11.0 pg.						
Max. = JD 2420718.724 + $13^d.601666E$						
Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 46, 58, 1933.						
C 4134	1926 Dec. 15	2424865.785	0.894	−49.9	b	1.0
4403	1927 Sept. 5	5129.999	.319	40.3	b	0.3
4462	Oct. 10	5164.830	.880	49.6	b	0.7
4971	1928 Sept. 3	5493.972	.078	41.7	b	1.0
5080	Nov. 25	5576.833	.160	43.6	b	1.0
5326	1929 Sept. 18	5873.992	.017	35.6	b	0.3
5530	1930 Sept. 4	6224.010	.751	39.8	b	0.7
γ 17939	Dec. 4	6315.662	.489	37.8	b	0.3
V 132	1932 Jan. 17	6724.677	.550	24.3	c	0.2
C 6107	Aug. 22	6942.934	.606	32.8	b	1.0
6304	1933 Sept. 1	7317.000	.108	46.0	c	0.6
6312	Sept. 29	7345.915	.234	56.0	c	0.6
6325	Oct. 27	7373.889	0.290	−59.3	b	1.0
UZ Cassiopeiae $1^h6^m18^s$, $+60°41'$; 11.4–12.1 pg.						
Max. = JD 2422687.42 + $4^d.25968E$						
Elements by Oosterhoff, *Harvard Bull.*, No. 900, 10, 1935. Photographic light-curve by Lehmann-Balanowsky, *Pulkowa Obs. Circ.*, No. 2, 21, 1932.						
C 6149	1932 Oct. 10	2426991.795	0.495	−45.2	c	0.6
γ 19268	Nov. 10	7022.727	.754	35.3	b	.7
C 6296	1933 Aug. 31	7316.000	.603	20.1	c	.4
6316	Sept. 30	7346.812	.836	44.3	c	.4
6331	Oct. 28	7374.764	.398	46.2	c	.6
6357	Dec. 26	7433.722	.239	61.6	c	.6
6508	1934 Aug. 22	7672.000	.177	59.5	c	.6
γ 20858	1935 Nov. 6	8113.899	0.917	−72.9	c	0.6

TABLE 1—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
VV Cassiopeiae $1^h44^m17^s$, $+59°23'$; 10.5–11.5 pg.						
Max. = JD 2422514.159 + $6^d.207747E$						
Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 46, 57, 1933.						
C 5669.....	1930 Dec. 30	2426341.740	0.581	−51.0	c	0.4
5817.....	1931 Aug. 25	6579.929	.951	41.1	c	.6
5822.....	Aug. 27	6581.006	.124	62.3	c	.4
γ 19189.....	1932 Oct. 11	6992.859	.469	48.9	b	.7
19905.....	1933 Oct. 1	7347.941	.669	47.4	c	.6
20845.....	1935 Oct. 20	8096.894	.317	62.1	c	.6
20888.....	Dec. 8	8145.733	.185	61.3	c	.4
C 6831.....	1936 Jan. 3	8171.625	0.356	−64.1	c	0.6
VW Cassiopeiae $0^h59^m35^s$, $+61°14'$; 10.5–11.7 pg.						
Max. = JD 2420751.32 + $5^d.99386E$						
Elements by Oosterhoff, *Harvard Bull.*, No. 900, 10, 1935. Photographic light-curve by Lehmann-Balanowsky, *Pulkowa Obs. Circ.*, No. 2, 20, 1932.						
C 6100.....	1932 Aug. 21	2426941.985	0.834	−42.0	b	1.0
6125.....	Sept. 9	6960.969	.002	60.6	c	0.6
γ 19119.....	Sept. 13	6964.889	.656	40.7	b	0.7
C 6317.....	1933 Sept. 30	7346.892	.388	62.5	c	0.6
6332.....	Oct. 28	7374.867	.055	70.9	b	0.6
6790.....	1935 Aug. 9	8024.002	.355	74.7	c	0.6
γ 20822.....	Oct. 8	8084.970	.527	41.3	c	0.4
20945.....	1936 Mar. 4	8232.642	0.164	−86.0	c	0.4
XY Cassiopeiae $0^h44^m7^s$, $+59°34'$; 10.2–10.8 pg.						
Max. = JD 2419403.784 + $4^d.501880E$						
Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 46, 57, 1933.						
C 4938.....	1928 Aug. 23	2425482.868	0.343	−26.8	b	0.7
5812.....	1931 Aug. 24	6578.938	.813	42.3	c	0.6
6130.....	1932 Sept. 11	6962.963	.116	52.6	b	1.0
γ 19196.....	Oct. 12	6993.819	.970	55.6	b	1.0
C 6157.....	Nov. 6	7018.748	.508	32.9	c	0.6
6315.....	1933 Sept. 30	7346.743	.365	42.3	c	0.6
6832.....	1936 Jan. 3	8171.743	0.622	−31.9	c	0.4

TABLE 1—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
AP Cassiopeiae $0^h27^m36^s$, $+62°21'$; 12.0–13.1 pg.						
Max. = JD 2426289.53 + $6^d.8465E$						
Elements by Oosterhoff, *Harvard Bull.*, No. 900, 10, 1935. No light-curve available.						
C 6079	1932 July 23	2426912.954	0.057	−51.1	c	0.6
6106	Aug. 22	6942.855	.425	42.4	c	.6
6133	Sept. 12	6963.875	.495	42.2	c	.6
6310	1933 Sept. 28	7344.834	.138	52.7	c	.6
6535	1934 Sept. 17	7698.965	.862	45.3	c	.6
6620	1935 Jan. 12	7815.663	.907	43.9	c	.6
6786	Aug. 7	8022.976	.187	51.0	c	.6
6965	1936 Sept. 10	8422.986	0.613	−36.7	c	0.6
BY Cassiopeiae $1^h40^m15^s$, $+60°55'$; 11.1–11.5 pg.						
Max. = JD 2426933.30 + $3^d.241E$						
Elements by Lange, *Leningrad Univ. Astr. Obs. Bull.*, No. 2, 10, 1933. Lange's visual curve seems uncertain and has been omitted.						
C 6507	1934 Aug. 21	2427671.943	0.906	−67.3	c	0.6
6534	Sept. 17	7698.861	.211	49.2	c	.4
6544	Sept. 20	7701.783	.113	53.4	c	.4
γ 20824	1935 Oct. 9	8085.910	.634	33.5	c	.6
20919	1936 Feb. 4	8203.615	.952	62.4	c	.4
C 6845	Feb. 28	8227.646	0.366	−30.0	c	0.2
CG Cassiopeiae $23^h55^m54^s$, $+60°25'$; 12.2–13.3 pg.						
Max. = JD 2426945.11 + $4^d.363E$						
Elements and visual light-curve by Lange, *Leningrad Univ. Astr. Obs. Bull.*, No. 2, 9, 1933.						
C 6503	1934 Aug. 20	2427670.979	0.369	−88.1	c	0.6
6510	Aug. 22	7672.892	.808	67.6	c	.4
6561	Oct. 19	7730.819	.084	105.7	c	.6
6789	1935 Aug. 8	8023.951	.270	96.6	c	.6
γ 20820	Oct. 8	8084.844	.227	111.2	c	.6
20857	Nov. 6	8113.826	0.870	−67.3	c	0.4
46.1932 Cassiopeiae $23^h52^m13^s$, $+62°9'$; 10.5–11.5 pg.						
Max. = JD 2427346.96 + $9^d.79E$						
Period by Stuker, *A.N.*, **246**, 407, 1932. The epoch is arbitrarily chosen so as to make the phase of plate C 6318 zero. No light-curve is available.						
C 6139	1932 Sept. 21	2426972.751	0.776	−64.1	c	0.4
γ 19194	Oct. 12	6993.707	.917	71.0	b	1.0
C 6318	1933 Sept. 30	7346.963	0.000	−91.1	b	1.0

TABLE 1—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
46.1932 Cassiopeiae—*Continued*						
C 6343.....	1933 Nov. 25	2427402.757	0.700	−65.0	b	1.0
6471.....	1934 July 23	7642.989	.238	72.2	c	0.6
6541.....	Sept. 19	7700.933	.156	82.2	b	1.0
γ 20605.....	Oct. 20	7731.740	.303	69.2	c	0.6
20843.....	1935 Oct. 20	8096.783	0.590	−57.1	c	0.6

δ Cephei $22^h25^m27^s$, $+57°54'$; 3.9–4.6 pg.

Max. = JD $2393659.873 + 5^d.366396E - 0^d.84 \times 10^{-8}E^2$

Elements by Prager, *Kleinere Veröff. Berlin-Babelsberg*, No. 15, 138, 1936. The velocity-curve is plotted according to Prager's elements from Jacobsen's observations made with the three-prism spectrograph of the Lick Observatory, *Lick Obs. Bull.*, No. 12, 145, 1926. Photographic light-curve by Robinson, *Harvard Ann.*, **90**, 57, 1933. Observations of this well-known star were carried out as a test of the usefulness of low dispersion in determining radial velocity-curves of Cepheid variables.

γ 17100.....	1929 Nov. 20	2425936.681	0.672	− 5.1	b	1.0
C 5558.....	1930 Sept. 22	6242.754	.708	− 2.5	b	1.0
γ 17790.....	Oct. 5	6255.799	.139	−37.5	b	1.0
C 5566.....	Oct. 6	6256.729	.312	−16.1	b	1.0
5571.....	Oct. 7	6257.808	.513	−14.5	b	1.0
5586.....	Oct. 30	6280.700	.779	+ 5.3	b	0.7
5593.....	Nov. 1	6282.621	.137	−28.6	b	1.0
5616.....	Nov. 29	6310.708	.371	−15.6	b	1.0
5622.....	Nov. 30	6311.740	.564	−13.8	b	1.0
5627.....	Dec. 1	6312.607	.725	+ 0.4	b	1.0
5655.....	Dec. 28	6339.614	.758	+ 7.9	b	1.0
5663.....	Dec. 29	6340.610	.943	−22.7	b	1.0
5667.....	Dec. 30	6341.607	0.129	−27.9	b	1.0

SZ Cygni $20^h29^m38^s$, $+46°16'$; 9.7–11.0 pg.

Max. = JD $2426399.219 + 15^d.111056E$

Elements by Florja and Parenago, *N.N.V.S.*, **4**, 320, 1934. Photographic light-curve by Henroteau, *Dom. Obs. Pub.*, **9**, 69, 1925.

C 2797.....	1924 May 20	2423926.971	0.395	− 8.6	b	0.4
3863.....	1926 June 25	4692.981	.087	34.6	b	0.4
γ 16782.....	1929 Aug. 13	5837.910	.854	1.3	b	0.4
17573.....	1930 July 10	6168.915	.759	3.8	b	0.4
17631.....	Aug. 8	6197.887	.676	15.2	b	0.7
C 5815.....	1931 Aug. 25	6579.747	.947	3.9	b	1.0
5820.....	Aug. 26	6580.888	.022	33.8	b	1.0
5897.....	Oct. 31	6646.667	0.375	−21.4	b	1.0

TABLE 1—*Continued*

	Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
	TX Cygni $20^h56^m26^s$, $+42°12'$; 10.5–12.4 pg.						
	Max. = JD 2422290.941 + $14^d.70791E + 0^d.000000138E^2$						
	Elements by Florja and Parenago, *N.N.V.S.*, **4**, 323, 1934. Photographic light-curve by Koolikovsky, *ibid.*, **4**, 86, 1932.						
C	4396	1927 Sept. 4	2425128.882	0.950	−30.3	b	1.0
	4444	Oct. 7	5161.649	.178	35.2	b	0.7
	4517	Nov. 3	5188.647	.013	36.4	b	1.0
	5328	1929 Sept. 20	5875.833	.734	8.7	b	0.3
	5513	1930 Aug. 11	6200.844	.830	6.0	b	0.7
	6341	1933 Nov. 25	7402.646	.537	5.5	b	0.7
	6929	1936 July 10	8360.934	0.676	− 1.4	c	0.2
	VX Cygni $20^h53^m34^s$, $+39°48'$; 10.1–10.8 pg.						
	Max. = JD 2420369.820 + $20^d.132467E$						
	Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 50, 59, 1933.						
C	4368	1927 July 16	2425078.949	0.907	− 8.7	b	0.3
	4936	1928 Aug. 5	5464.935	.080	−45.1	b	1.0
	6160	1932 Nov. 7	7019.632	.303	−42.2	c	0.6
	6266	1933 July 1	7255.972	.042	−40.1	c	0.6
γ	19718	July 4	7258.977	.191	−50.9	c	0.6
	19913	Oct. 3	7349.635	.694	+14.0	c	0.4
	20604	1934 Oct. 20	7731.653	.670	+ 7.8	c	0.6
	20636	Nov. 14	7756.670	.912	−14.8	b	1.0
	20793	1935 July 11	7995.917	.796	+ 4.1	c	0.6
	21005	1936 May 1	8290.993	0.453	−10.6	c	0.4
	VY Cygni $21^h0^m27^s$, $+39°34'$; 10.1–11.3 pg.						
	Max. = JD 2423497.144 + $7^d.856956E$						
	Elements and photographic light-curve by Parenago, *N.N.V.S.*, **4**, 407, 1935.						
C	4445	1927 Oct. 7	2425161.721	0.860	+ 4.1	b	1.0
	4513	Nov. 2	5187.698	.166	−20.8	b	1.0
	4990	1928 Sept. 27	5517.723	.171	−18.9	b	1.0
γ	17570	1930 July 9	6167.978	.932	−15.4	b	0.7
	17637	Aug. 9	6198.922	.871	− 2.0	b	0.7
C	5511	Aug. 10	6199.922	.998	−26.2	b	1.0
	5816	1931 Aug. 25	6579.840	.352	−14.3	b	1.0
	6051	1932 June 21	6880.962	.678	− 5.5	b	1.0
	6957	1936 Sept. 8	8420.644	.613	+ 9.5	c	0.6
	6961	Sept. 9	8421.826	0.764	+ 3.3	c	0.6

TABLE 1—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
VZ Cygni $21^h47^m41^s$, $+42°40'$; 9.0–9.9 pg.						
Max. = JD 2420642.129 + $4^d.864691\,E$						
Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 50, 57, 1933.						
C 1760	1922 July 2	2423238.890	0.798	− 6.1	a	0.5
3372	1925 July 4	4336.934	.515	−10.9	b	1.0
4388	1927 Sept. 3	5127.744	.076	−32.8	b	1.0
5233	1929 June 24	5787.971	.794	+ 1.4	b	1.0
γ 16699	July 13	5806.938	.693	− 2.1	b	1.0
16704	July 14	5807.946	.900	−23.8	b	1.0
C 5321	Sept. 16	5871.796	0.026	−26.5	b	1.0
BZ Cygni $20^h42^m34^s$, $+44°56'$; 11.2–12.0 pg.						
Max. = JD 2426674.10 + $10^d.1416\,E$						
Elements by Beyer and photographic light-curve by Plaut, *A.N.*, **252**, 99, 1934.						
C 6506	1934 Aug. 21	2427671.821	0.379	−17.3	c	0.6
6537	Sept. 18	7699.819	.140	−32.7	c	.6
6601	Dec. 15	7787.663	.802	−10.9	c	.4
6762	1935 July 10	7994.990	.245	−31.8	c	.4
6785	Aug. 7	8022.899	.997	−48.1	c	.6
γ 21052	1936 Aug. 2	8383.875	.590	+ 3.6	c	.6
C 6968	Sept. 25	8437.833	0.911	−19.5	c	0.6
CD Cygni $20^h0^m37^s$, $+33°50'$; 9.0–10.5 pg.						
Max. = JD 2421501.035 + $17^d.071343\,E$						
Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 49, 58, 1933.						
C 3951	1926 Aug. 16	2424744.874	0.017	−22.7	b	1.0
4039	Sept. 25	4784.727	.351	−24.4	b	0.3
4401	1927 Sept. 5	5129.844	.567	− 6.7	b	0.7
4857	1928 June 25	5423.941	.795	+22.4	b	0.3
4989	Sept. 27	5517.649	.284	−23.8	b	1.0
5258	1929 July 24	5817.849	.869	+ 4.0	b	1.0
5492	1930 July 7	6165.974	.261	−25.6	b	1.0
γ 17728	Sept. 2	6222.826	.592	+ 3.7	b	0.7
C 5528	Sept. 3	6223.819	.650	+ 8.1	b	0.7
5590	Oct. 31	6281.651	.037	−31.6	b	1.0
5790	1931 July 8	6531.969	.700	+24.2	b	1.0
V 67	Oct. 25	6640.700	0.070	−47.0	b	0.7

TABLE 1—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
MW Cygni $20^h8^m27^s$, $+32°35'$; 10–11 pg.						
Max. = JD 2425173.40 + $5^d.9550E$						
Elements by Oosterhoff, *Harvard Bull.*, No. 900, 10, 1935. No light-curve in magnitudes available.						
C 6265	1933 July 1	2427255.903	0.707	− 5.1	c	0.4
γ 19713	July 3	7257.920	.045	−16.9	b	1.0
C 6282	July 31	7285.938	.750	− 0.4	b	0.3
6293	Aug. 30	7315.635	.737	+ 2.7	c	0.6
γ 19914	Oct. 3	7349.735	.463	− 6.1	b	0.7
C 6466	1934 July 21	7640.870	.353	−23.9	c	0.4
6475	July 24	7643.910	.863	−12.7	b	1.0
γ 20887	1935 Dec. 8	8145.630	0.115	−25.8	c	0.2
MZ Cygni $21^h17^m53^s$, $+37°2'$; 10.8–12.2 vis.						
Max. = JD 2427642.12 + $21^d.1655E$						
Elements and visual light-curve by Beyer, *A.N.*, **258**, 285, 1936.						
C 6252	1933 May 31	2427224.979	0.291	−70.1	c	0.4
6301	Aug. 31	7316.861	.632	43.4	c	.2
γ 19908	Oct. 2	7348.765	.140	66.5	c	.6
C 6323	Oct. 27	7373.754	.320	82.3	c	.6
γ 20834	1935 Oct. 19	8095.738	.432	64.0	c	.6
20856	Nov. 6	8113.739	.282	83.8	c	.4
C 6825	Dec. 7	8144.691	.745	24.3	c	.2
γ 21033	1936 July 1	8351.847	.532	47.8	c	.2
C 6937	July 28	8378.887	.810	24.3	c	.2
6978	Oct. 24	8466.772	0.962	−44.3	c	0.6
RZ Geminorum $5^h56^m35^s$, $+22°14'$; 10.0–11.1 pg.						
Max. = JD 2420409.203 + $5^d.530209E$						
Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 46, 57, 1933.						
C 4448	1927 Oct. 8	2425162.017	0.428	+13.3	b	0.7
4515	Nov. 2	5187.948	.116	−11.7	b	0.7
5620	1930 Nov. 30	6311.029	.198	+ 4.3	b	1.0
5942	1932 Jan. 16	6723.819	.840	+11.0	b	0.7
6621	1935 Feb. 10	7844.701	.524	+ 7.8	c	0.4
γ 20837	Oct. 19	8095.977	.961	− 6.4	c	0.6
20851	Nov. 5	8112.892	.020	+ 0.2	c	0.6
20905	1936 Jan. 9	8177.737	0.745	+ 9.8	c	0.4

TABLE 1—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
AA Geminorum $6^h0^m21^s$, $+26°20'$; 10.2–11.0 pg.						
Max. = JD 2420726.34 + $11^d.30111E$						
Elements and photographic light-curve by Kukarkin, *N.N.V.S.*, **3**, 29, 1930.						
C 6174.....	1932 Nov. 8	2427020.988	0.994	+ 8.4	c	0.6
γ 19276.....	Nov. 11	7023.860	.248	+ 6.5	b	1.0
C 6363.....	1934 Jan. 23	7461.632	.985	− 0.7	c	0.4
6628.....	1935 Mar. 16	7878.765	.896	− 1.7	c	0.6
γ 20852.....	Nov. 5	8112.934	.617	+20.2	c	0.6
20926.....	1936 Feb. 5	8204.752	.741	+22.0	c	0.6
20940.....	Mar. 3	8231.774	0.132	− 7.4	c	0.6
AD Geminorum $6^h37^m9^s$, $+21°3'$; 9.5–10.3 pg.						
Max. = JD 2420410.450 + $3^d.787928E$						
Elements and photographic light-curve by Kukarkin, *N.N.V.S.*, **3**, 29, 1930.						
γ 19200.....	1932 Oct. 13	2426994.029	0.042	− 1.2	b	1.0
C 6200.....	1933 Jan. 5	7078.712	.398	+35.5	c	0.4
γ 19572.....	Apr. 3	7166.712	.630	+68.8	b	0.3
C 6361.....	1934 Jan. 22	7460.920	.300	+38.0	b	1.0
6364.....	Jan. 23	7461.674	.499	+46.2	c	0.6
γ 20607.....	Oct. 20	7731.913	.841	+50.8	c	0.6
C 6614.....	Dec. 17	7789.740	.107	+ 3.5	c	0.6
γ 20684.....	1935 Jan. 15	7818.688	0.749	+51.2	c	0.6
AP Herculis $18^h45^m57^s$, $+15°49'$; 10.5–11.2 vis.						
Max. = JD 2425394.94 + $10^d.422E$						
Elements and visual light-curve by Beyer, *A.N.*, **252**, 176, 1934; **226**, 324, 1926.						
C 5811.....	1931 Aug. 24	2426578.736	0.586	−29.8	c	0.4
6116.....	1932 Aug. 24	6944.792	.710	19.0	c	.4
6145.....	Oct. 8	6989.649	.014	19.1	c	.6
6239.....	1933 Apr. 5	7168.955	.218	41.7	c	.6
6246.....	May 15	7208.844	.046	24.8	c	.6
6383.....	1934 Mar. 21	7518.000	.709	32.9	c	.6
6440.....	June 21	7610.708	.605	24.9	c	.4
6952.....	1936 Aug. 28	8409.781	.277	54.5	c	.6
γ 21073.....	Oct. 7	8449.635	.101	22.9	c	.4
21082.....	Nov. 5	8478.642	0.884	−11.9	c	0.6

TABLE 1—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
BB Herculis $18^h41^m16^s$, $+12°14'$; 9.6–10.6 pg.						
Max. = JD 2426244.300 + $7^d.507122E$						
Elements and photographic light-curve by Parenago, *N.N.V.S.*, **4**, 307, 1934.						
γ 19117	1932 Sept. 13	2426964.726	0.966	+ 82.4	b	1.0
19186	Oct. 11	6992.684	.690	99.8	b	0.3
19193	Oct. 12	6993.660	.820	99.2	b	0.3
C 6248	1933 May 15	7208.979	.502	92.5	b	1.0
6263	July 1	7255.670	.721	104.7	c	0.6
γ 19716	July 4	7258.759	.133	83.8	b	1.0
19838	Sept. 2	7318.781	.128	81.3	b	1.0
19903	Oct. 1	7347.727	0.984	+81.9	b	1.0
BL Herculis $17^h56^m38^s$, $+19°16'$; 10.1–11.1 pg.						
Max. = JD 2426503.16 + $4^d.20345E$						
Elements and photographic light-curve by Parenago, *N.N.V.S.*, **4**, 309, 1934. Both light- and velocity-curves are peculiar.						
C 6049	1932 June 21	2426880.830	0.848	+21.5	c	0.4
6127	Sept. 11	6962.674	.318	5.6	b	1.0
γ 19185	Oct. 11	6992.627	.444	5.5	b	0.7
19192	Oct. 12	6993.617	.680	25.5	b	1.0
19526	1933 Mar. 6	7138.010	.031	14.3	b	1.0
19570	Apr. 2	7165.993	.688	35.6	b	0.7
C 6260	June 30	7254.706	.793	16.9	b	1.0
6267	July 2	7256.663	.258	11.5	c	0.2
6433	1934 May 24	7582.812	.849	19.1	b	0.3
6438	June 20	7609.694	.244	8.7	b	0.7
6463	July 21	7640.684	.617	26.6	c	0.4
γ 20744	1935 Apr. 21	7914.001	.639	28.5	c	0.4
C 6697	June 11	7965.708	.964	14.3	b	1.0
6844	1936 Feb. 28	8227.031	.109	8.6	b	1.0
γ 20951	Mar. 4	8232.972	.522	19.1	c	0.4
C 6914	May 2	8291.994	0.563	+14.6	b	0.7
V Lacertae $22^h44^m33^s$, $+55°48'$; 8.7–9.9 pg.						
Max. = JD 2418031.919 + $4^d.983443E$						
Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 50, 57, 1933.						
C 4128	1926 Dec. 14	2424864.672	0.091	−22.7	b	1.0
4499	1927 Oct. 28	5182.722	.912	+ 1.3	b	1.0
4980	1928 Sept. 24	5514.778	0.544	−22.8	b	1.0

TABLE 1—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
V Lacertae—*Continued*						
C 4997	1928 Sept. 28	2425518.798	0.351	−24.0	b	1.0
γ 16257	Oct. 28	5548.799	.371	−31.9	b	1.0
C 5255	1929 July 23	5816.931	.175	−45.6	b	1.0
5287	Aug. 21	5845.997	.008	−17.1	b	1.0
γ 17636	1930 Aug. 9	6198.817	.806	− 5.2	b	1.0
C 5514	Aug. 11	6200.972	0.240	−36.4	b	1.0

X Lacertae $22^h44^m58^s$, $+55°54'$; 8.8–9.4 pg.

Max. = JD 2418890.652 + $5^d.443996E$

Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 50, 57, 1933.

C 3946	1926 Aug. 15	2424743.954	0.185	−37.5	b	1.0
4036	Sept. 21	4780.872	.966	30.7	b	1.0
4040	Sept. 25	4784.813	.690	16.8	b	1.0
4051	Oct. 19	4808.767	.090	42.6	b	1.0
4133	Dec. 15	4865.699	.548	17.6	b	1.0
4147	Dec. 19	4869.660	.276	30.6	b	1.0
4372	1927 July 17	5079.977	.908	30.2	b	1.0
4553	Nov. 30	5215.778	.853	16.2	b	0.3
4555	Dec. 1	5216.750	.032	32.5	b	1.0
4562	Dec. 5	5220.654	0.749	−16.7	b	1.0

Y Lacertae $22^h5^m13^s$, $+50°33'$; 8.3–8.8 pg.

Max. = JD 2418424.295 + $4^d.323844E$

Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 50, 56, 1933.

C 4390	1927 Sept. 3	2425127.876	0.375	−22.3	b	1.0
4397	Sept. 4	5128.978	.630	−10.1	b	1.0
4925	1928 July 29	5457.882	.698	+ 5.3	b	1.0
5278	1929 Aug. 19	5843.840	.960	−20.8	b	1.0
5361	Dec. 10	5956.660	.053	−37.4	b	1.0
γ 17638	1930 Aug. 9	6198.994	.099	−29.1	b	1.0
C 5559	Sept. 22	6242.788	.227	−30.0	c	0.6
5587	Oct. 30	6280.750	.007	−50.0	b	1.0
γ 17935	Dec. 3	6314.690	.856	−11.8	b	1.0
C 6050	1932 June 21	6880.885	0.804	− 4.6	b	1.0

TABLE 1—*Continued*

	Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
	Z Lacertae $22^h36^m55^s$, $+56°18'$; 8.4–9.8 pg.						
	Max. = JD 2418475.781 + $10^d.885569E$						
	Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 50, 58, 1933.						
C	1220	1921 Aug. 16	2422918.874	0.163	−38.7	a	1.5
	1274	Sept. 8	2941.762	.266	−40.0	b	1.0
	1297	Sept. 12	2945.925	.649	− 2.8	a	1.0
	3513	1925 Sept. 23	4417.726	.855	−22.9	b	1.0
	4052	1926 Oct. 19	4808.835	.784	−13.2	b	1.0
	4508	1927 Oct. 29	5183.768	.228	−33.7	b	1.0
	4926	1928 July 29	5457.939	.414	−19.7	b	1.0
	5229	1929 June 23	5786.964	.640	− 9.9	b	1.0
γ	16828	Aug. 19	5843.988	.878	−35.0	b	1.0
C	5285	Aug. 21	5845.868	.051	−43.5	b	1.0
	5324	Sept. 18	5873.754	0.613	+ 4.8	b	1.0
	RR Lacertae $22^h37^m28^s$, $+55°55'$; 8.7–9.9 pg.						
	Max. = JD 2419434.331 + $6^d.416234E$						
	Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 50, 57, 1933.						
C	3952	1926 Aug. 16	2424744.956	0.686	−16.4	b	1.0
	4132	Dec. 15	4865.635	.494	32.6	b	0.7
	4992	1928 Sept. 27	5517.840	.143	41.3	b	1.0
	5286	1929 Aug. 21	5845.934	.278	38.6	b	1.0
γ	17723	1930 Sept. 1	6221.900	.874	33.6	b	1.0
C	5628	Dec. 1	6312.635	.016	51.1	b	1.0
γ	18025	Dec. 31	6342.673	.697	28.1	b	0.7
C	5807	1931 Aug. 2	6556.906	.086	47.6	b	1.0
	5924	Dec. 19	6695.667	.713	21.0	b	1.0
	6056	1932 June 22	6881.983	0.751	−22.3	b	1.0
	BG Lacertae $21^h56^m21^s$, $+42°58'$; 8.9–9.6 pg.						
	Max. = JD 2420455.051 + $5^d.331847E$						
	Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 50, 57, 1933.						
γ	18915	1932 June 23	2426882.944	0.566	−16.0	b	1.0
	19029	Aug. 20	6940.861	.428	17.6	b	1.0
C	6117	Aug. 24	6944.826	.172	18.2	b	1.0
	6129	Sept. 11	6962.861	.554	5.3	b	0.7
	6278	1933 July 14	7268.972	.966	32.3	b	1.0
	6287	Aug. 1	7286.941	.336	14.0	b	1.0
	6476	1934 July 24	7643.956	.295	34.4	b	1.0
γ	20775	1935 June 13	7967.962	.064	36.0	b	1.0
C	6756	July 9	7993.941	0.936	−25.4	b	1.0

TABLE 1—*Continued*

	Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
	RX Librae $15^h36^m12^s$, $-20°27'$; 11.6–13.5 pg.						
	Max. = JD 2425001.0 + $24^d.950E$						
	Elements and photographic light-curve by Parenago, *N.N.V.S.*, **3**, 106, 1931.						
C	6022	1932 May 15	2426843.833	0.861	−54.1	c	0.2
	6235	1933 Apr. 4	7167.955	.852	44.1	c	.4
	6254	June 1	7225.822	.171	53.3	c	.4
	6394	1934 Apr. 19	7547.823	.077	57.7	c	.4
	6418	May 20	7578.778	.318	73.8	c	.4
	6758	1935 July 10	7994.675	0.987	−44.7	c	0.6
	SV Monocerotis $6^h16^m4^s$, $+6°31'$; 8.6–10.2 pg.						
	Max. = JD 2419041.805 + $15^d.230721E$						
	Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 46, 58, 1933.						
C	4136	1926 Dec. 15	2424865.935	0.393	+15.3	b	1.0
	4163	1927 Jan. 12	4893.870	.228	+13.1	b	1.0
	4172	Jan. 16	4897.873	.490	+25.3	b	1.0
	4638	1928 Jan. 9	5255.910	.998	+15.7	b	1.0
	5069	Nov. 21	5572.042	.754	+53.7	b	0.7
	5073	Nov. 22	5573.026	.819	+60.0	b	1.0
γ	16492	1929 Mar. 27	5698.677	.069	− 2.1	b	1.0
C	5405	1930 Mar. 10	6046.681	.918	+28.5	b	0.7
γ	18060	1931 Feb. 25	6398.767	.034	+19.7	b	1.0
C	5852	Sept. 24	6609.010	0.838	+59.4	b	1.0
	TX Monocerotis $6^h45^m48^s$, $-1°19'$; 11.1–12.0 pg.						
	Max. = JD 2423542.51 + $8^d.7019E$						
	Elements by Oosterhoff, *Harvard Bull.*, No. 900, 11, 1935. Photographic light-curve from a letter by Miss H. H. Swope, of the Harvard College Observatory.						
C	6175	1932 Nov. 9	2427021.016	0.741	+47.2	c	0.6
	6194	1933 Jan. 4	7077.910	.279	55.0	c	.4
	6384	1934 Mar. 21	7518.664	.929	42.7	c	.4
γ	20608	Oct. 21	7732.004	.446	68.3	c	.6
C	6616	Dec. 17	7789.885	.097	36.0	c	.4
γ	20903	1936 Jan. 8	8176.817	.563	56.7	c	.2
	20921	Feb. 4	8203.754	0.658	+68.7	c	0.2

TABLE 1—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
WW Monocerotis $6^h28^m9^s$, $+9°17'$; 12.8–14.4 pg.						
Max. = JD 2425298.17 + $4^d.66231E$						
Elements and photographic light-curve by Parenago, *N.N.V.S.*, **4**, 152, 1933.						
C 6184	1933 Jan. 3	2427076.831	0.498	+64.5	c	0.4
6380	1934 Mar. 20	7517.688	.055	23.6	c	.2
6563	Oct. 19	7730.997	.807	80.2	c	.4
6824	1935 Dec. 5	8142.976	0.171	+38.1	c	0.4
AC Monocerotis $6^h56^m13^s$, $-8°34'$; 9.4–10.1 vis.						
Max. = JD 2426687.6 + $8^d.0167E$						
Elements and visual light-curve by Lause, *A.N.*, **251**, 43, 1934.						
γ 19271	1932 Nov. 10	2427022.969	0.834	+52.5	b	0.7
C 6191	1933 Jan. 4	7077.795	.673	58.8	c	.6
γ 20139	1934 Jan. 7	7445.833	.582	64.6	c	.6
C 6583	Nov. 15	7757.028	.400	47.1	c	.6
γ 20676	Dec. 18	7790.802	.613	72.5	c	.6
20711	1935 Mar. 19	7881.641	.944	22.7	c	.6
20746	Apr. 21	7914.684	0.066	+ 9.6	c	0.4
BF Ophiuchi $16^h59^m54^s$, $-26°27'$; 7.8–8.6 pg.						
Max. = JD 2420418.868 + $4^d.0680116E$						
Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 48, 56, 1933.						
C 4776	1928 Apr. 28	2425365.971	0.098	−42.2	b	1.0
4922	July 29	5457.681	.643	11.5	b	1.0
γ 16572	1929 May 16	5748.850	.218	44.6	b	0.7
C 5253	July 23	5816.674	.890	49.7	b	1.0
γ 17426	1930 May 7	6104.929	.750	23.4	b	1.0
17485	June 4	6132.842	.611	20.9	b	1.0
C 5473	June 10	6138.892	.098	47.7	b	1.0
5485	July 6	6164.688	.439	14.8	b	0.7
5525	Sept. 3	6223.646	0.932	−54.6	b	1.0
BH Ophiuchi $18^h11^m10^s$, $+12°4'$; 11.1–12.9 vis.						
Max. = JD 2424385.54 + $11^d.0509E$						
Elements by Oosterhoff, *Harvard Bull.*, No. 900, 11, 1935. No light-curve available.						
C 6055	1932 June 22	2426881.870	0.894	+53.0	c	0.4
6103	Aug. 22	6942.704	.399	28.8	c	.6
6147	Oct. 10	6991.670	.830	59.6	c	.2
6290	1933 Aug. 29	7314.720	0.063	+19.1	c	0.6

TABLE 1—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
BH Ophiuchi—*Continued*						
C 6685.....	1935 May 23	2427946.990	0.277	+ 4.3	c	0.2
6759.....	July 10	7994.750	.599	38.0	c	.6
6899.....	1936 Apr. 12	8271.990	.686	47.2	c	.6
6918.....	May 27	8316.828	.744	61.6	c	.2
6949.....	Aug. 27	8408.764	0.063	+21.1	c	0.4
RS Orionis $6^h16^m31^s$, $+14°44'$; 8.6–9.8 pg.						
Max. = JD 2419045.912 + $7^d.566646E$						
Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 46, 57, 1933.						
C 2531.....	1923 Nov. 18	2423742.031	0.634	+60.8	b	1.0
2559.....	Nov. 25	3749.981	.685	63.1	b	1.0
2664.....	1924 Feb. 11	3827.816	.971	19.8	b	0.7
2713.....	Mar. 13	3858.701	.053	31.8	b	0.7
2737.....	Apr. 12	3888.632	.009	23.7	b	1.0
4694.....	1928 Feb. 28	5305.694	.286	26.5	b	1.0
γ 16260.....	Oct. 29	5549.014	.443	44.6	b	1.0
C 5397.....	1930 Feb. 11	6019.715	.650	57.3	b	0.7
γ 17329.....	Mar. 12	6048.691	.480	48.3	b	1.0
17860.....	Nov. 4	6285.984	.840	43.3	b	1.0
C 5618.....	Nov. 29	6310.890	.132	25.0	b	1.0
γ 17942.....	Dec. 4	6315.925	.797	78.6	b	1.0
18058.....	1931 Feb. 25	6398.655	0.731	+57.7	b	1.0
CR Orionis $6^h0^m7^s$, $+13°14'$; 12.4–13.1 pg.						
Max. = JD 2425234.1 + $4^d.9143E$						
Elements and photographic light-curve by Hoffmeister, *A.N.*, **238**, 19, 1930.						
C 6166.....	1932 Nov. 7	2427019.972	0.403	+34.5	c	0.4
6359.....	1934 Jan. 22	7460.787	.104	28.8	c	.6
6609.....	Dec. 16	7788.854	.861	56.9	c	.4
6821.....	1935 Dec. 4	8141.962	.714	50.2	c	.4
6897.....	1936 Apr. 12	8271.669	0.108	+17.4	c	0.2
CS Orionis $6^h1^m51^s$, $+11°9'$; 11.1–12.0 pg.						
Max. = JD 2422715.94 + $3^d.88946E$						
Elements by Oosterhoff, *Harvard Bull.*, No. 900, 11, 1933. Photographic light-curve by Hoffmeister, *A.N.*, **238**, 20, 1930.						
C 6151.....	1932 Oct. 10	2426991.983	0.392	+ 2.0	c	0.4
6542.....	1934 Sept. 20	7701.007	.686	+34.6	c	.4
6546.....	Sept. 21	7702.000	0.941	+19.5	c	0.4

TABLE 1—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
CS Orionis—*Continued*						
γ 20854	1935 Nov. 6	2428113.033	0.620	+24.1	c	0.4
20866	Nov. 8	8115.915	.361	+ 6.2	c	.6
20902	1936 Jan. 8	8176.712	.992	+12.1	c	.6
20928	Feb. 5	8204.872	.232	+ 8.0	c	.4
C 6893	Apr. 11	8270.736	0.166	− 8.0	c	0.2
SV Persei $4^h42^m46^s$, +42°7′; 8.8–9.7 pg.						
Max. = JD 2419611.424 + $11^d.128428E$						
Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 46, 58, 1933.						
C 1914	1922 Oct. 1	2423329.959	0.147	−23.3	b	1.0
2580	1923 Dec. 17	3771.896	.860	− 1.2	b	1.0
2622	1924 Jan. 16	3801.792	.546	− 8.5	b	0.7
4055	1926 Oct. 20	4809.007	.054	−20.0	b	1.0
4097	Nov. 14	4834.840	.376	−15.8	b	0.7
4628	1928 Jan. 8	5254.794	.113	−27.2	b	1.0
4693	Feb. 28	5305.643	.682	+ 7.3	b	0.7
5000	Sept. 29	5519.012	.856	− 1.3	b	1.0
5075	Nov. 22	5573.911	.789	+ 8.6	b	1.0
5802	1931 July 31	6554.981	.948	+ 1.9	b	1.0
5805	Aug. 1	6555.979	.037	−12.8	b	1.0
5847	Sept. 22	6607.984	0.710	− 0.6	b	1.0
SX Persei $4^h10^m12^s$, +41°29′; 10.9–11.8 vis.						
Max. = JD 2421642.28 + $4^d.29007E$						
Elements by Oosterhoff, *Harvard Bull.*, No. 900, 11, 1935. Visual light-curve by Nijland, *Recherches astr. de l'Observatoire d'Utrecht*, **8**, 211, 1923.						
C 5632	1930 Dec. 1	2426312.953	0.717	+10.4	b	0.7
5635	Dec. 2	6313.872	.931	− 0.4	c	.6
6190	1933 Jan. 4	7077.713	.980	−25.1	c	.6
6558	1934 Oct. 18	7729.934	.010	−17.8	c	.4
γ 20920	1936 Feb. 4	8203.677	.438	+21.6	c	.6
21077	Oct. 7	8449.883	0.828	− 9.8	c	0.6
UX Persei $2^h6^m6^s$, +57°38′; 11.3–12.4 vis.						
Max. = JD 2425910.82 + $4^d.56590E$						
Elements by Oosterhoff, *Harvard Bull.*, No. 900, 11, 1935. Visual light-curve by Kukarkin, *N.N.V.S.*, **4**, 14, 1932.						
C 4662	1928 Jan. 31	2425277.694	0.336	−51.4	b	0.3
5851	1931 Sept. 23	6608.917	.894	30.4	c	.6
6126	1932 Sept. 10	6961.018	0.009	−32.7	c	0.6

TABLE 1—*Continued*

	Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
		UX Persei—*Continued*					
C	6143.....	1932 Sept. 21	2426972.991	0.631	−24.2	c	0.6
	6158.....	Nov. 6	7018.856	.676	42.4	c	.4
	6164.....	Nov. 7	7019.845	.893	21.1	c	.6
	6171.....	Nov. 8	7020.771	0.096	−64.1	c	0.6
		UY Persei $2^h27^m0^s$, +58°26′; 11.1–12.1 vis.					
		Max. = JD 2423523.073 + $5^d.365069E$					
		Elements and visual light-curve by Kukarkin, *N.N.V.S.*, **4**, 16, 1932.					
C	5339.....	1929 Oct. 14	2425899.976	0.033	−73.3	b	0.3
	5670.....	1930 Dec. 30	6341.852	.395	50.4	c	.4
	6119.....	1932 Aug. 24	6944.917	.800	57.5	c	.4
	6313.....	1933 Sept. 29	7345.974	.554	55.7	c	.2
	6608.....	1934 Dec. 16	7788.722	.078	68.7	c	.4
	6979.....	1936 Oct. 24	8466.878	0.480	−53.2	c	0.2
		VX Persei $2^h0^m50^s$, +57°58′; 9.5–10.4 pg.					
		Max. = JD 2420438.985 + $10^d.895287E$					
		Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 46, 58, 1933.					
C	4161.....	1927 Jan. 12	2424893.682	0.864	−44.7	b	1.0
	4520.....	Nov. 3	5188.885	.959	37.8	b	1.0
	4634.....	1928 Jan. 9	5255.731	.094	42.1	b	1.0
	5362.....	1929 Dec. 10	5956.774	.438	25.0	b	0.7
	5850.....	1931 Sept. 23	6608.812	.284	37.8	b	1.0
γ	19120.....	1932 Sept. 13	6964.979	.974	46.9	b	1.0
C	6142.....	Sept. 21	6972.912	0.702	−19.1	c	0.4
		VY Persei $2^h20^m18^s$, +58°28′; 11.2–11.7 vis.					
		Max. = JD 2420273.930 + $5^d.531943E$					
		Elements and visual light-curve by Kukarkin, *N.N.V.S.*, **4**, 48, 1932.					
C	5601.....	1930 Nov. 2	2426283.828	0.399	−46.0	c	0.4
	6112.....	1932 Aug. 23	6943.969	.732	20.5	c	.4
	6120.....	Aug. 24	6944.979	.914	36.1	c	.6
γ	19455.....	1933 Feb. 1	7105.693	.966	68.1	c	.4
	20825.....	1935 Oct. 9	8085.974	.170	48.1	c	.4
	20846.....	Oct. 20	8096.960	.156	43.5	c	.6
C	6819.....	Dec. 4	8141.812	.264	58.6	c	.2
	6834.....	1936 Feb. 2	8201.667	.084	61.2	c	.4
γ	20925.....	Feb. 5	8204.679	0.628	−23.9	c	0.2

TABLE 1—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
AS Persei $4^h12^m22^s$, $+48°44'$; 9.4–10.1 vis.						
Max. = JD 2423459.98 + $4^d.97244E$						
Elements by Oosterhoff, *Harvard Bull.*, No. 900, 11, 1935. Visual light-curve by Beyer, *A.N.*, **252**, 186, 1934.						
C 6121.....	1932 Aug. 25	2426945.023	0.871	−19.1	b	1.0
γ 19197.....	Oct. 12	6993.901	.700	15.4	b	0.7
19264.....	Nov. 9	7021.900	.332	25.5	b	1.0
19269.....	Nov. 10	7022.840	.521	20.2	b	1.0
20826.....	1935 Oct. 10	8086.019	.336	35.2	c	0.6
C 6826.....	Dec. 7	8144.780	0.153	−42.9	b	1.0
AW Persei $4^h41^m5^s$, $+36°33'$; 7.2–7.9 vis.						
Max. = JD 2416512.64 + $6^d.46338E$						
Elements by Kukarkin, *N.N.V.S.*, **2**, 49, 1930. Visual light-curve by Jacchia, *A.N.*, **240**, 316, 1930.						
γ 18652.....	1932 Jan. 18	2426725.771	0.153	+ 6.1	b	0.7
C 5946.....	Jan. 19	6726.767	.307	+ 8.6	b	1.0
γ 19032.....	Aug. 21	6941.026	.457	+23.2	b	1.0
C 6113.....	Aug. 24	6944.016	.920	+ 0.2	b	0.7
γ 19198.....	Oct. 12	6993.939	.644	+33.0	b	1.0
19265.....	Nov. 9	7021.936	.975	− 0.2	b	1.0
C 6181.....	Dec. 10	7052.909	.767	+24.1	b	0.7
6197.....	1933 Jan. 5	7078.615	.744	+21.5	b	1.0
6319.....	Oct. 1	7347.028	0.273	+ 8.0	b	1.0
X Puppis $7^h28^m26^s$, $-20°42'$; 8.5–10.3 pg.						
Max. = JD 2419040.869 + $25^d.957789E$						
Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 81, 59, 1933.						
C 768.....	1920 Nov. 21	2422650.994	0.077	+37.6	a	1.0
4534.....	1927 Nov. 7	5192.984	.004	80.3	b	1.0
4688.....	1928 Feb. 27	5304.689	.308	40.5	b	1.0
4734.....	Apr. 8	5345.656	.886	97.1	b	0.3
5125.....	1929 Jan. 21	5633.854	.989	91.1	b	0.7
5387.....	1930 Feb. 9	6017.792	.780	86.5	b	0.7
5411.....	Mar. 11	6047.761	.934	95.1	b	0.3
5416.....	Mar. 12	6048.681	.970	79.1	b	0.7
γ 17853.....	Nov. 3	6284.988	.073	25.2	b	1.0
C 5619.....	Nov. 29	6310.951	.073	36.0	b	1.0
5902.....	1931 Nov. 1	6647.057	0.021	+54.4	b	1.0

TABLE 1—*Continued*

	Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
	RS Puppis $8^h9^m14^s$, $-34°17'$; 7.4–9.5 pg.						
	Max. = JD 2419186.3 + $41^d.337E$						
	Elements and photographic light-curve by Gerasimovič, *Harvard Bull.*, No. 848, 16, 1927.						
C	3093	1924 Dec. 3	2424123.942	0.448	+15.1	b	0.7
	4137	1926 Dec. 15	4865.981	.399	+23.6	b	1.0
	4535	1927 Nov. 8	5193.035	.311	+ 7.6	b	1.0
	4596	Dec. 31	5246.896	.614	+38.4	b	0.3
	4630	1928 Jan. 8	5254.908	.808	+43.4	b	0.3
	4689	Feb. 27	5304.732	.013	− 7.7	b	1.0
	5132	1929 Feb. 26	5669.726	.843	+55.8	b	0.3
	5598	1930 Nov. 2	6283.026	.680	+31.7	b	1.0
	5659	Dec. 28	6339.901	.056	− 2.7	b	1.0
	5671	Dec. 30	6341.927	.105	− 8.7	b	1.0
	6206	1933 Feb. 4	7108.816	0.657	+33.7	b	0.7
	VZ Puppis $7^h34^m34^s$, $-28°16'$; 9.7–10.9 vis.						
	Max. = JD 2426781.2 + $23^d.17E$						
	Elements and visual light-curve by Florja, *N.N.V.S.*, **4**, 35, 1932.						
C	6214	1933 Mar. 2	2427134.710	0.257	+38.5	c	0.6
	6338	Nov. 4	7381.001	.887	63.9	c	.4
	6388	1934 Apr. 3	7531.649	.389	42.4	c	.4
	6829	1935 Dec. 8	8145.007	.861	69.5	c	.2
	6836	1936 Feb. 2	8201.819	.313	33.2	c	.2
	6841	Feb. 27	8226.767	.390	29.5	c	.2
	7002	1937 Mar. 18	8611.691	.003	45.7	c	.2
	7004	Mar. 19	8612.646	0.044	+52.3	c	0.6
	WW Puppis $7^h37^m35^s$, $-20°54'$; 9.6–10.5 vis.						
	Max. = JD 2424497.73 + $5^d.5159E$						
	Elements by Oosterhoff, *Harvard Bull.*, No. 900, 11, 1935. Visual light-curve by Florja, *N.N.V.S.*, **4**, No. 2, Tafel I, 1932.						
C	6195	1933 Jan. 4	2427077.965	0.781	+98.4	c	0.2
	6232	Apr. 4	7167.638	.038	69.3	c	.4
γ	20067	Dec. 1	7408.007	.616	99.6	c	.4
	20134	1934 Jan. 6	7444.865	0.298	+83.4	c	0.2

TABLE 1—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
WX Puppis $7^h37^m50^s$, $-25°38'$; 9.4–10.0 vis.						
Max. = JD 2426711.65 + $8^d.941E$						
Elements by Florja, *Tashkent Circ.*, No. 15, 1933. Visual light-curve by Florja, *N.N.V.S.*, **4**, No. 2, Tafel I, 1932.						
C 6215.....	1933 Mar. 2	2427134.740	0.320	+36.0	c	0.6
γ 20020.....	Nov. 3	7380.033	.755	74.1	b	1.0
20212.....	1934 Feb. 24	7493.766	.475	46.9	c	0.6
C 6617.....	Dec. 17	7789.958	.603	65.0	c	0.4
6622.....	1935 Feb. 10	7844.771	.733	74.6	c	0.6
γ 20715.....	Mar. 20	7882.631	.968	49.2	c	0.6
20868.....	Nov. 9	8116.001	.069	31.2	c	0.6
C 6842.....	1936 Feb. 27	8226.815	0.462	+41.5	c	0.4
WY Puppis $7^h53^m50^s$, $-23°46'$; 10.6–11.7 pg.						
Max. = JD 2424164.70 + $5^d.2509E$						
Elements by Oosterhoff, *Harvard Bull.*, No. 900, 11, 1935. Photographic light-curve by Kruytbosch, *B.A.N.*, **8**, 5, 1936.						
C 6185.....	1933 Jan. 3	2427076.962	0.622	+65.0	b	0.3
6346.....	Nov. 26	7403.042	.721	56.0	c	.4
6355.....	Dec. 25	7432.972	.421	50.1	c	.4
γ 20716.....	1935 Mar. 20	7882.660	.061	21.0	c	.4
20860.....	Nov. 7	8114.003	0.119	+28.8	c	0.6
WZ Puppis $7^h56^m13^s$, $-23°29'$; 10.9–11.7 vis.						
Max. = JD 2423538.46 + $5^d.0270E$						
Elements by Oosterhoff, *Harvard Bull.*, No. 900, 12, 1935. Visual light-curve by Florja, *N.N.V.S.*, **4**, No. 2, Tafel I, 1932.						
C 6360.....	1934 Jan. 22	2427460.868	0.268	+63.6	b	0.3
γ 20153.....	Jan. 26	7464.868	.064	58.5	c	.6
C 6385.....	Mar. 21	7518.740	.780	72.0	c	.6
6634.....	1935 Mar. 17	7879.740	.592	65.6	c	.6
γ 20712.....	Mar. 19	7881.715	.986	45.0	c	.6
20869.....	Nov. 9	8116.035	.598	82.0	c	.4
20900.....	1936 Jan. 7	8175.892	.505	78.1	c	.6
20922.....	Feb. 4	8203.812	0.059	+39.8	c	0.6

TABLE 1—*Continued*

	Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
	AD Puppis $7^h43^m52^s$, $-25°20'$; 9.5–11.5 pg.						
	Max. = JD 2425832.48 + $13^d.595E$						
	Elements and photographic light-curve by Wesselink, *B.A.N.*, **7**, 243, 1935.						
C	6225.....	1933 Mar. 4	2427136.792	0.940	+60.8	c	0.4
	6327.....	Oct. 28	7374.004	.389	67.7	c	.4
	6392.....	1934 Apr. 19	7547.649	.162	38.9	c	.4
	6559.....	Oct. 19	7730.014	.576	80.8	c	.4
	6605.....	Dec. 15	7787.922	.835	80.5	c	.4
	6830.....	1935 Dec. 8	8145.049	0.104	+44.6	c	0.2
	U Sagittarii $18^h26^m0^s$, $-19°12'$; 7.3–8.5 pg.						
	Max. = JD 2420600.325 + $6^d.744917E$						
	Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 49, 57, 1933.						
γ	7144.....	1918 July 19	2421794.731	0.082	−21.9	a	1.0
	8018.....	1919 Apr. 9	2058.021	.118	−20.9	a	0.5
	8697.....	Sept. 11	2213.676	.195	−13.4	a	1.0
C	3954.....	1926 Aug. 17	4745.747	.599	− 0.2	b	1.0
	5207.....	1929 June 14	5777.931	.631	+ 9.1	b	1.0
γ	17373.....	1930 Apr. 9	6076.028	.826	+16.2	b	0.3
	17476.....	June 2	6130.949	.969	+ 2.3	b	1.0
	17731.....	Sept. 4	6224.644	0.860	+16.3	b	1.0
	VY Sagittarii $18^h6^m7^s$, $-20°43'$; 11.9–14.0 pg.						
	Max. = JD 2424738.80 + $13^d.5583E$						
	Elements by Oosterhoff, *Harvard Bull.*, No. 900, 12, 1935. Photographic light-curve by Parenago, *N.N.V.S.*, **3**, 108, 1931.						
C	6115.....	1932 Aug. 24	2426944.709	0.698	+12.4	c	0.2
	6138.....	Sept. 21	6972.674	.760	+11.1	c	.2
	6294.....	1933 Aug. 30	7315.717	.062	−22.3	c	.4
	6464.....	1934 July 21	7640.743	.034	− 4.6	c	.2
	6688.....	1935 June 8	7962.920	.797	+23.1	c	.2
	6760.....	July 10	7994.853	.152	−38.6	c	.2
	6931.....	1936 July 11	8361.781	0.215	−30.5	c	0.2

TABLE 1—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
WZ Sagittarii $18^h11^m7^s$, $-19°7'$; 7.9–10.1 pg.						
Max. = JD 2420889.050 + $21^d847498E$						
Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 49, 59, 1933.						
C 945	1921 Mar. 18	2422767.635	0.959	− 7.9	b	0.3
3966	1926 Aug. 20	4748.748	.665	+14.1	b	0.3
5214	1929 June 17	5780.877	.908	+ 6.0	b	1.0
5228	June 23	5786.865	.182	−43.2	b	1.0
γ 16698	July 13	5806.853	.097	−39.8	b	1.0
C 5280	Aug. 20	5844.677	.828	+13.7	b	0.7
5323	Sept. 18	5873.662	.155	−33.8	b	1.0
5436	1930 Apr. 12	6079.000	.554	+ 0.5	b	0.3
5457	May 14	6111.925	.060	−41.2	b	1.0
5844	1931 Sept. 22	6607.657	0.751	+16.3	b	0.7
XX Sagittarii $18^h18^m57^s$, $-16°51'$; 8.9–10.0 pg.						
Max. = JD 2419189.730 + $6^d424264E$						
Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 49, 57, 1933.						
C 3949	1926 Aug. 16	2424744.745	0.693	+16.9	b	0.3
4895	1928 July 10	5438.868	.740	+19.1	b	0.3
5202	1929 June 13	5776.892	.357	− 6.3	b	0.3
5461	1930 June 5	6133.920	.932	+20.8	b	0.7
5721	1931 Apr. 29	6461.958	.994	−15.7	b	1.0
5848	Sept. 23	6608.653	.828	+32.3	b	1.0
6016	1932 May 13	6841.954	.144	−25.7	b	1.0
6259	1933 June 2	7226.931	.069	− 6.8	b	1.0
6299	Aug. 31	7316.675	0.039	−17.9	c	0.6
YZ Sagittarii $18^h43^m42^s$, $-16°50'$; 7.6–8.4 pg.						
Max. = JD 2419741.300 + $9^d553151E$						
Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 49, 58, 1933.						
γ 8173	1919 May 13	2422092.993	0.169	+ 5.0	b	1.0
8711	Sept. 13	2215.679	.012	11.5	a	1.5
13497	1925 July 1	4333.844	.736	15.8	a	1.5
15229	1927 Sept. 5	5129.703	.044	8.9	a	1.5
C 5432	1930 Apr. 11	6078.028	.313	26.8	b	1.0
5458	May 14	6111.988	0.868	+ 2.9	b	1.0

TABLE 1—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
YZ Sagittarii—*Continued*						
γ 17543.....	1930 June 26	2426154.853	0.355	+28.1	b	0.6
17568.....	July 9	6167.839	.714	28.6	b	1.0
C 6279.....	1933 July 31	7285.656	.724	31.6	b	1.0
6284.....	Aug. 1	7286.655	.829	7.3	b	1.0
6298.....	Aug. 31	7316.651	.969	2.8	c	0.4
6403.....	1934 Apr. 22	7550.014	.397	26.5	b	1.0
γ 20402.....	May 22	7580.844	.624	40.0	b	1.0
C 6469.....	July 23	7642.717	.100	9.8	b	1.0
6512.....	Aug. 23	7673.642	0.338	+10.5	b	1.0

AP Sagittarii $18^h6^m58^s$, $-23°8'$; 7.2–8.2 pg.

Max. = JD 2419491.158 + 5^d.058132 E

Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 49, 57, 1933.

γ 6905.....	1918 May 18	2421732.927	0.201	−17.5	b	0.7
C 2931.....	1924 Aug. 13	4011.648	.707	7.8	b	0.4
3799.....	1926 May 22	4658.897	.669	3.6	b	1.0
4843.....	1928 June 12	5410.867	.335	17.4	b	1.0
γ 17486.....	1930 June 4	6132.897	.081	20.8	b	1.0
17567.....	July 9	6167.792	.980	29.7	b	1.0
17721.....	Sept. 1	6221.665	.631	13.3	b	1.0
C 5701.....	1931 Mar. 30	6431.037	.024	34.9	b	1.0
5707.....	Mar. 31	6432.044	.223	28.4	b	1.0
5745.....	June 1	6494.844	0.639	− 7.4	b	1.0

AY Sagittarii $18^h17^m26^s$, $-18°37'$; 10.5–11.3 vis.

Max. = JD 2426860.67 + 6^d.56959 E

Elements by Florja, *Tashkent Circ.*, No. 34, 1934. Visual light-curve by Hoffmeister, *A.N.*, **218**, 326, 1923.

C 6044.....	1932 June 20	2426879.786	0.910	+ 5.8	c	0.2
6247.....	1933 May 15	7208.910	.008	−54.3	c	.2
6271.....	July 13	7267.707	.958	−25.4	c	.4
6285.....	Aug. 1	7286.710	.850	−26.7	c	.4
6439.....	1934 June 20	7609.854	.038	−51.7	c	.4
6465.....	July 21	7640.814	.751	+12.8	c	.2
6749.....	1935 July 8	7992.733	.319	−42.2	c	.4
γ 20818.....	Oct. 8	8084.625	.306	−31.9	c	.2
C 6896.....	1936 Apr. 12	8271.004	.676	+ 2.6	c	.2
6935.....	July 28	8378.705	0.070	−64.4	c	0.4

TABLE 1—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
BB Sagittarii $18^h45^m4^s$, $-20°25'$; 7.1–8.1 pg.						
Max. = JD 2419282.142 + 6^d.636794 E						
Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 49, 57, 1933.						
C 4375	1927 July 18	2425080.826	0.718	+31.3	b	1.0
4935	1928 Aug. 5	5464.833	.578	+26.4	b	1.0
5232	1929 June 24	5787.910	.258	− 7.3	b	1.0
5337	Oct. 13	5898.632	.941	− 1.2	b	1.0
γ 17481	1930 June 3	6131.941	.094	− 5.7	b	1.0
C 5527	Sept. 3	6223.735	.926	− 9.5	b	1.0
5569	Oct. 7	6257.642	.035	−18.9	b	1.0
5722	1931 Apr. 30	6462.007	.827	+ 6.4	b	1.0
5746	June 1	6494.906	0.784	+17.3	b	1.0
V 350 Sagittarii $18^h39^m20^s$, $-20°45'$; 7.5–8.4 pg.						
Max. = JD 2425885.014 + 5^d.15424 E						
Elements by Florja, *Tashkent Circ.*, No. 33, 1934. Photographic light-curve by Albitzky, *A.N.*, **238**, 12, 1930.						
γ 17487	1930 June 4	2426132.942	0.102	− 0.7	b	1.0
17725	Sept. 2	6222.645	.506	+16.0	b	1.0
C 5526	Sept. 3	6223.690	.708	+20.7	b	0.7
5553	Sept. 19	6239.674	.809	+25.5	b	1.0
γ 17788	Oct. 5	6255.660	.911	+ 5.4	b	0.3
C 5743	1931 May 31	6493.983	.149	− 8.1	b	0.7
γ 18366	July 30	6553.708	.737	+33.0	b	0.7
C 5840	Sept. 21	6606.638	.006	− 5.3	b	1.0
5845	Sept. 22	6607.720	0.216	− 6.6	b	1.0
RV Scorpii $16^h51^m47^s$, $-33°27'$; 7.0–8.1 pg.						
Max. = JD 2420499.353 + 6^d.061428 E						
Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 48, 57, 1933.						
C 3867	1926 June 27	2424694.769	0.150	−31.7	b	1.0
4263	1927 May 12	5013.858	.792	− 4.7	b	0.7
4365	July 16	5078.684	.487	− 9.6	b	1.0
4369	July 17	5079.672	.650	− 2.0	b	0.7
4373	July 18	5080.670	.815	+ 6.5	b	0.7
4782	1928 Apr. 29	5366.962	.046	−39.1	b	1.0
4842	June 12	5410.809	.280	−19.1	b	1.0
5162	1929 Apr. 20	5722.938	.774	+ 2.6	b	1.0
5185	May 21	5753.818	.869	−19.5	b	1.0
5209	June 16	5779.756	.148	−35.4	b	1.0
5489	1930 July 7	6165.729	.825	− 3.2	b	0.7
5741	1931 May 31	6493.828	0.954	−28.9	b	0.7

TABLE 1—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.

RY Scorpii $17^h44^m16^s$, $-33°40'$; 8.3–9.4 pg.

Max. = JD 2419664.594 + $20^d.314133E$

Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 48, 59, 1933.

C	1084	1921 June 26	2422867.839	0.685	− 3.4	b	0.3
	4366	1927 July 16	5078.744	.521	− 3.0	b	0.3
	4806	1928 May 13	5380.915	.396	−19.9	b	0.3
	4823	May 27	5394.897	.084	−40.5	b	1.0
	4875	July 4	5432.782	.950	−26.7	b	0.7
	5163	1929 Apr. 21	5723.009	.236	−25.9	b	0.3
	5186	May 21	5753.924	.758	− 5.0	b	0.3
	5272	Aug. 18	5842.666	.127	−25.5	b	0.3
	5994	1932 Apr. 13	6811.992	.844	−11.3	b	0.3
	6269	1933 July 2	7256.785	0.739	+ 2.2	c	0.2

X Scuti $18^h25^m42^s$, $-13°11'$; 9.8–11.0 pg.

Max. = JD 2420934.435 + $4^d.198026E$

Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 49, 56, 1933.

C	4367	1927 July 16	2425078.833	0.225	+ 6.4	b	0.7
	4942	1928 Aug. 24	5483.710	.670	+19.4	b	.3
	5326	1929 July 16	5809.809	.349	+ 7.9	b	.3
γ	19026	1932 Aug. 20	6940.694	.734	+25.0	b	.7
C	6401	1934 Apr. 21	7549.913	.854	+ 5.5	c	.4
	6699	1935 June 11	7965.965	.961	− 7.4	c	.6
γ	20839	Oct. 20	8096.616	0.083	−12.6	c	0.6

Y Scuti $18^h32^m36^s$, $-8°27'$; 9.9–10.9 pg.

Max. = JD 2420138.056 + $10^d.341392E$

Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 49, 58, 1933.

C	4328	1927 July 6	2425068.869	0.804	+12.2	b	0.3
	4335	July 8	5070.824	.993	+ 3.7	b	.7
	4930	1928 Aug. 4	5463.775	.990	− 0.1	b	.7
	5277	1929 Aug. 19	5843.744	.733	+20.8	b	.3
γ	19766	1933 Aug. 2	7287.705	.362	+12.9	c	.6
	20772	1935 June 13	7967.802	.127	−12.1	c	.4
	20840	Oct. 20	8096.648	.586	+19.3	c	.4
C	6932	1936 July 11	8361.854	.231	−18.8	c	.6
	6942	July 30	8380.667	.050	− 3.0	c	.6
γ	21045	Aug. 1	8382.819	0.258	− 8.5	c	0.6

TABLE 1—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
Z Scuti $18^h37^m36^s$, $-5°55'$; 9.6–11.2 pg.						
Max. = JD 2420133.222 + $12^d.901723E$						
Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 49, 58, 1933.						
C 4332	1927 July 7	2425069.894	0.637	+44.4	b	0.3
4336	July 8	5070.896	.714	50.5	b	0.3
5327	1929 Sept. 20	5875.681	.092	9.8	b	1.0
5565	1930 Oct. 6	6256.677	.623	42.5	c	0.4
γ 19767	1933 Aug. 2	7287.776	.542	34.4	c	0.6
C 6402	1934 Apr. 21	7549.971	.865	39.8	c	0.6
γ 20776	1935 June 14	7968.878	.334	22.8	b	0.7
C 6745	June 22	7976.955	0.960	+25.4	b	0.7
RU Scuti $18^h36^m40^s$, $-4°12'$; 9.5–11.7 pg.						
Max. = JD 2419198.251 + $19^d.696466E$						
Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 49, 59, 1933.						
C 1115	1921 July 11	2422882.894	0.071	−20.7	b	0.3
4831	1928 May 31	5398.916	.811	− 0.3	b	0.3
4876	July 4	5432.861	.534	+ 3.1	b	0.3
5283	1929 Aug. 21	5845.705	.495	+ 4.6	b	0.3
6255	1933 June 1	7225.965	.571	−11.4	c	0.4
γ 19768	Aug. 2	7287.847	.713	+15.1	c	0.4
C 6666	1935 May 10	7933.995	.518	− 6.6	c	0.2
6783	Aug. 7	8022.684	.021	−18.4	b	1.0
6791	Aug. 9	8024.767	.127	−39.3	c	0.6
6901	1936 Apr. 27	8286.922	.437	−23.1	c	0.6
6919	May 27	8316.912	.959	−30.8	c	0.4
6925	May 29	8318.936	.062	−30.2	c	0.4
γ 21010	May 31	8320.880	0.161	−29.2	c	0.6
SS Scuti $18^h38^m18^s$, $-7°50'$; 8.0–8.9 pg.						
Max. = JD 2419984.342 + $3^d.6711843E$						
Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 49, 56, 1933.						
C 3320	1925 June 6	2424308.964	0.991	− 6.4	b	1.0
γ 17542	1930 June 26	6154.787	.778	5.4	b	0.7
C 5532	Sept. 6	6226.670	.358	22.6	b	0.7
γ 18148	1931 Mar. 27	6428.009	.201	23.5	b	1.0
C 5700	Mar. 29	6430.997	.015	16.6	b	1.0
5753	June 22	6515.773	.107	19.0	b	0.3
6015	1932 May 13	6841.894	.940	5.0	b	1.0
γ 19027	Aug. 20	6940.771	0.873	− 2.4	b	1.0

TABLE 1—*Continued*

	Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
	TY Scuti $18^h36^m49^s$, $-4°24'$; 12.1–13.2 pg.						
	Max. = JD 2425903.518 + $11^d.0515E$						
	Elements by Harwood, *Harvard Bull.*, No. 893, 22, 1933. Photographic light-curve by Parenago, *N.N.V.S.*, **3**, 110, 1932.						
C	6045	1932 June 20	2426879.892	0.348	+24.2	c	0.2
	6104	Aug. 22	6942.773	.037	−29.5	c	.6
	6280	1933 July 31	7285.729	.070	−14.8	c	.2
	6691	1935 June 9	7963.934	.438	+15.5	c	.6
	6784	Aug. 7	8022.790	.763	+12.6	c	.6
	6891	1936 Apr. 11	8270.021	0.134	+ 1.1	c	0.4
	UZ Scuti $18^h25^m44^s$, $-13°0'$; 12.0–12.9 pg.						
	Max. = JD 2424790.95 + $14^d.749E$						
	Elements by Oosterhoff, *Harvard Bull.*, No. 900, 12, 1935. Unpublished photographic light-curve kindly supplied by Miss H. H. Swope, of the Harvard College Observatory.						
C	6088	1932 July 25	2426914.756	0.997	+11.7	c	0.4
	6277	1933 July 14	7268.891	.007	− 3.1	c	.4
	6281	July 31	7285.823	.155	− 5.7	c	.2
γ	20769	1935 June 12	7966.891	.333	+ 4.2	c	.4
C	6890	1936 Apr. 10	8269.970	0.882	+31.3	c	0.4
	BX Scuti $18^h44^m52^s$, $-4°29'$; 13.3–14.5 pg.						
	Max. = JD 2425388.43 + $6^d.4099E$						
	Elements by Oosterhoff, *Harvard Bull.*, No. 900, 12, 1935. Unpublished photographic light-curve kindly supplied by Miss Margaret Harwood, of the Maria Mitchell Observatory.						
C	6098	1932 Aug. 21	2426941.736	0.329	−13.5	c	0.4
	6430	1934 May 23	7581.896	.200	25.4	c	.2
	6509	Aug. 22	7672.767	.376	7.5	c	.4
	6741	1935 June 21	7975.875	.664	3.3	c	.2
	6788	Aug. 8	8023.833	0.146	−31.6	c	0.4
	ST Tauri $5^h39^m24^s$, $+13°32'$; 8.3–9.2 pg.						
	Max. = JD 2419718.565 + $4^d.034229E$						
	Elements and photographic light-curves by Robinson, *Harvard Ann.*, **90**, 46, 56, 1933.						
C	4183	1927 Feb. 8	2424920.698	0.499	+12.9	b	0.7
	4503	Oct. 28	5182.998	.517	14.0	b	1.0
	4512	Oct. 30	5184.045	0.777	+ 9.3	b	1.0

TABLE 1—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
ST Tauri—*Continued*						
C 4629.....	1928 Jan. 8	2425254.854	0.329	+ 3.1	b	1.0
4643.....	Jan. 11	5257.828	.066	−22.3	b	1.0
5064.....	Nov. 4	5555.951	.964	−11.6	b	1.0
γ 17852.....	1930 Nov. 3	6284.917	.660	+12.0	b	1.0
17859.....	Nov. 4	6285.937	.912	+ 3.6	b	1.0
C 5660.....	Dec. 28	6339.955	.302	− 1.6	b	1.0
γ 18028.....	Dec. 31	6342.903	.033	−20.9	b	1.0
C 5907.....	1931 Nov. 3	6649.022	.914	+ 0.3	b	1.0
5956.....	1932 Feb. 18	6756.793	0.628	+18.0	b	0.7

SW Tauri $4^h19^m17^s$, $+3°54'$; 9.0–10.0 pg.

Max. = JD 2419730.9036 + 1^d.5836468E

Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 46, 56, 1933. 0.55 day has been added to the epoch given to reduce it to maximum.

C 4162.....	1927 Jan. 12	2424893.783	0.121	+11.0	b	1.0
4170.....	Jan. 15	4896.807	.030	+ 8.9	b	0.3
4188.....	Feb. 11	4923.747	.041	+ 8.4	b	1.0
4635.....	1928 Jan. 9	5255.794	.714	+14.2	b	0.7
γ 19191.....	1932 Oct. 12	6993.031	.699	+35.8	b	0.7
20019.....	1933 Nov. 2	7379.980	.039	+ 3.1	b	0.7
C 6337.....	Nov. 3	7380.906	.624	+44.0	b	0.7
γ 20065.....	Nov. 30	7407.832	.626	+33.5	b	1.0
20105.....	Dec. 27	7434.750	.624	+34.9	b	0.7
20148.....	1934 Jan. 25	7463.642	.868	− 5.8	c	1.0
20836.....	1935 Oct. 19	8095.917	.120	+ 3.7	b	1.0
C 6820.....	Dec. 4	8141.874	.140	+16.7	b	0.7
γ 20895.....	1936 Jan. 6	8174.767	.911	+ 3.4	b	1.0
20938.....	Mar. 3	8231.628	.816	+ 3.1	b	1.0
20944.....	Mar. 4	8232.610	0.436	+25.4	c	1.0

W Virginis $13^h20^m52^s$, $-2°52'$; 9.8–11.1 pg.

Max. = JD 2414848.19 + 17^d.27169E

Elements by Güssow, *A.N.*, **244**, 301, 1932. 6.2 days have been added to the epoch to reduce it to maximum. Photographic light-curve by Chant, *Harvard Ann.*, **80**, 225, 1917.

Bright hydrogen lines are present on 11 plates taken during the increase in the star's light from phase 0.594 to maximum, but the emission shows no certain variation of velocity with phase. The mean velocity given by measures of $H\gamma$ and $H\delta$ is −108.8 km/sec. The large proper motion and high galactic latitude of this star are notable.

C 877.....	1921 Feb. 15	2422736.988	0.747	−34.9	b	0.7
981.....	Apr. 10	2790.800	.863	51.6	b	1.0
1041.....	June 9	2850.712	0.332	−78.1	b	1.0

TABLE 1—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
W Virginis—*Continued*						
C 1599.....	1922 Mar. 9	2423123.919	0.150	−94.0	b	0.7
2669.....	1924 Feb. 13	3829.015	.974	71.3	b	0.7
3285.....	1925 May 6	4277.705	.952	77.3	b	1.0
3290.....	May 7	4278.771	.014	88.2	b	1.0
3293.....	May 8	4279.807	.074	92.3	b	1.0
3733.....	1926 Mar. 24	4599.906	.607	43.4	b	0.3
3763.....	Apr. 24	4630.880	.400	70.5	b	0.7
4173.....	1927 Jan. 17	4898.000	.866	47.7	b	1.0
4223.....	Apr. 13	4984.816	.892	69.2	b	1.0
4250.....	May 9	5010.835	.399	61.8	b	0.3
4253.....	May 10	5011.729	.451	66.1	b	0.3
4307.....	June 16	5048.747	.594	47.7	b	0.7
4802.....	1928 May 12	5379.778	.760	43.7	b	0.7
4824.....	May 28	5395.724	0.683	−33.4	b	1.0

AL Virginis $14^h5^m45^s$, $-12°50'$; 9.3–10.4 pg.

Max. = JD 2425624.8 + $10^d.2974E$

Elements from Prager, *Kleinere Veröff. Berlin-Babelsberg*, No. 15, 150, 1936. No light-curve available.

C 5975.....	1932 Mar. 15	2426782.910	0.466	+29.2	b	0.7
5993.....	Apr. 13	6811.876	.279	11.5	b	0.7
6043.....	June 20	6879.679	.864	26.8	b	0.7
6077.....	July 23	6912.678	.068	22.6	b	1.0
γ 19525.....	1933 Mar. 5	7137.920	.942	21.7	b	0.7
19569.....	Apr. 2	7165.922	.661	42.5	b	0.3
C 6253.....	June 1	7225.681	.464	28.2	b	0.3
γ 19711.....	July 3	7257.712	.575	26.8	b	0.7
C 6400.....	1934 Apr. 21	7549.862	.946	17.3	b	1.0
γ 20377.....	May 2	7560.826	.011	12.1	b	1.0
20380.....	May 3	7561.802	.106	0.2	c	0.6
C 6417.....	May 20	7578.674	.744	30.0	b	1.0
6431.....	May 24	7582.665	.132	9.8	b	0.7
6434.....	June 19	7608.693	0.660	+48.9	b	0.7

X Vulpeculae $19^h53^m19^s$, $+26°17'$; 8.8–9.5 pg.

Max. = JD 2420636.248 + $6^d.319490E$

Elements and photographic light-curve by Robinson, *Harvard Ann.*, **90**, 49, 57, 1933.

C 3955.....	1926 Aug. 17	2424745.866	0.308	−18.0	b	0.3
3956.....	Aug. 18	4746.722	.444	5.8	b	1.0
3967.....	Aug. 20	4748.826	0.777	− 5.1	b	1.0

TABLE 1—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
X Vulpeculae—*Continued*						
C 3975.....	1926 Aug. 21	2424749.862	0.941	−25.0	b	1.0
4530.....	1927 Nov. 7	5192.693	.015	−30.5	b	1.0
4924.....	1928 July 29	5457.823	.969	−24.3	b	1.0
5062.....	Nov. 4	5555.660	.451	− 4.4	b	0.7
5183.....	1929 May 20	5752.976	0.674	+12.8	b	0.3
SV Vulpeculae $19^h47^m30^s$, $+27°12'$; 8.0–9.6 pg.						
Max. = JD 2423561.26 + $45^d.212E$						
Elements by Zacharov, *Tashkent Obs. Pub.*, **1**, 84, 1929. Photographic light-curve by Gerasimovič, *N.N.V.S.*, **3**, 80, 1931.						
γ 14457.....	1926 Aug. 23	2424751.859	0.334	− 5.6	a	1.0
14518.....	Sept. 19	4778.653	.926	+13.9	a	1.5
14587.....	Oct. 16	4805.646	.523	− 1.0	a	1.0
C 4283.....	1927 June 7	5039.984	.706	+ 9.4	b	1.0
γ 15144.....	Aug. 5	5098.906	.010	−23.1	a	1.5
C 4505.....	Oct. 29	5183.632	.884	+23.5	b	1.0
4529.....	Nov. 7	5192.642	.083	−27.6	a	1.5
γ 15714.....	1928 Apr. 28	5365.922	.916	+11.1	a	1.5
15722.....	Apr. 29	5366.951	.938	+ 4.6	a	1.5
15730.....	Apr. 30	5367.984	.961	− 7.9	a	1.5
C 4808.....	May 13	5380.994	0.249	−13.0	b	1.5

TABLE 2

OBSERVATIONS OF ADDITIONAL CEPHEIDS

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
KL Aquilae $19^h56^m35^s$, $+15°32'$; 8.5–9.5 vis.						
Max. = JD 2425857.84 + $6^d.0989E$						
Elements by Nabokov, *A.N.*, **241**, 192, 1931.						
C 6339	1933 Nov. 4	2427381.653	0.850	+ 3.1	c	0.6
γ 20061	Nov. 27	7404.646	.620	− 6.7	b	0.7
C 6420	1934 May 20	7578.984	.206	+17.8	b	1.0
γ 20399	May 21	7579.965	.366	−16.3	b	1.0
C 6442	June 21	7610.983	.452	−17.2	b	1.0
6536	Sept. 18	7699.760	.009	+ 7.8	b	1.0
γ 20842	1935 Oct. 20	8096.731	0.097	+ 3.7	c	0.6
AS Aurigae $5^h59^m4^s$, $+28°48'$; 11.5–12 pg.						
C 6333	1933 Oct. 29	2427375.006	.....	+26.9	c	0.6
C 6352	Dec. 25	7432.771	.....	+35.8	c	.6
γ 20949	1936 Mar. 4	8232.833	.....	−14.6	c	.2
21088	Nov. 6	8479.910	.....	+22.6	c	.6
21113	1937 Feb. 1	8566.885	.....	+ 1.9	c	0.4
176.1932 Canis Majoris $6^h15^m33^s$, $-21°37'$; 9–10 pg.						
C 6224	1933 Mar. 4	2427136.683	.....	+47.9	c	0.6
6632	1935 Mar. 17	7879.630	.....	72.4	c	.6
γ 20867	Nov. 8	8115.972	.....	66.7	c	.6
20889	Dec. 8	8145.869	.....	40.7	c	.6
C 6833	1936 Jan. 3	8171.840	.....	+57.1	c	0.6
BP Cassiopeiae $1^h8^m25^s$, $+65°5'$; 10.8–12.3 pg.						
Max. = JD 2426034.25 + $1^d.5064E$						
Elements by Beljawsky, *Pulkowa Obs. Circ.*, No. 6, 22, 1933.						
γ 20606	1934 Oct. 20	2427731.828	0.911	−48.5	c	0.2
20637	Nov. 14	7756.802	.489	11.6	c	.4
20821	1935 Oct. 8	8084.903	.294	65.1	c	.6
20835	Oct. 19	8095.837	.552	25.8	c	.4
20844	Oct. 20	8096.833	.214	35.0	c	.6
20904	1936 Jan. 9	8177.663	.871	43.8	c	.4
20934	Mar. 2	8230.637	.037	65.7	c	.2
21079	Oct. 8	8450.958	.294	40.7	c	.6
21087	Nov. 6	8479.796	.437	63.9	c	.6
21105	1937 Jan. 4	8538.769	0.586	−51.4	c	0.6

TABLE 2—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
AK Cephei $22^h25^m11^s$, $+57°42'$; 11.6–12.6 pg.						
Max. = JD 2427273.26 + $7^d.2399E$						
Elements by Zonn, *Beob. Zirk.*, No. 22, 1935.						
γ 20849	1935 Nov. 5	2428112.736	0.689	−71.0	c	0.6
20865	Nov. 8	8115.819	.377	53.0	c	.6
C 6934	1936 July 11	8361.974	.377	29.3	c	.4
6950	Aug. 27	8408.936	.864	58.5	c	.6
6959	Sept. 8	8420.873	.512	30.0	c	.4
6962	Sept. 9	8421.917	.656	33.6	c	.6
γ 21104	1937 Jan. 4	8538.667	0.782	−62.0	c	0.6
GH Cygni $19^h55^m6^s$, $+29°11'$; 10.1–11.5 pg.						
Max. = JD 2424738.76 + $7^d.8176E$						
Elements by Oosterhoff, *Harvard Bull.*, No. 900, 10, 1935.						
C 6083	1932 July 24	2426913.868	0.232	− 7.3	c	0.4
γ 19025	Aug. 19	6939.872	.558	−33.9	b	0.3
C 6128	Sept. 11	6962.785	.489	−34.0	b	0.3
γ 19260	Nov. 9	7021.626	.016	−11.2	b	1.0
19273	Nov. 11	7023.618	.271	−10.3	b	0.7
20855	1935 Nov. 6	8113.685	.708	−23.1	c	0.6
21011	1936 May 31	8320.939	.220	−28.3	c	0.6
21035	July 7	8357.819	.937	+ 3.4	c	0.6
C 6946	July 30	8380.958	.897	− 7.4	c	0.4
γ 21046	Aug. 1	8382.865	0.141	− 8.9	c	0.4
GL Cygni $20^h0^m1^s$, $+38°53'$; 14.0–15.2 pg.						
Max. = JD 2427312.0260 + $3^d.37040E$						
Unpublished elements by Baade.						
C 6295	1933 Aug. 30	2427315.861	0.138	−40.5	c	0.4
6560	1934 Oct. 19	7730.708	.223	93.3	c	.6
6747	1935 July 7	7991.901	.719	59.9	c	.6
6751	July 8	7992.943	0.028	−23.3	c	0.6
V 343 Cygni $20^h0^m30^s$, $+38°49'$; 14.1–15.4 pg.						
Max. = JD 2427313.1890 + $11^d.9290E$						
Unpublished elements by Baade.						
C 6291	1933 Aug. 29	2427314.875	0.141	−107.5	c	0.2
6502	1934 Aug. 20	7670.806	.979	117.5	c	.6
6964	1936 Sept. 10	8422.792	0.017	−105.2	c	0.4

TABLE 2—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
V 386 Cygni $21^h10^m52^s$, $+41°18'$; 10–11 pg.						
Max. = JD 2427977.09 + $5^d.238E$						
Elements by Seliwanow, *Beob. Zirk.*, No. 12, 1936.						
γ 21083.....	1936 Nov. 5	2428478.706	0.765	−14.7	c	0.6
21098.....	Dec. 5	8508.677	.487	−38.8	c	.6
21128.....	1937 Apr. 23	8647.988	.083	−14.2	c	.6
21134.....	Apr. 24	8648.988	0.274	+ 6.9	c	0.6
CN Lyrae $18^h37^m21^s$, $+28°38'$; 11.0–11.6 pg.						
Max. = JD 2427770.31 + $2^d.33596E$						
Elements by Florja, *N.N.V.S.*, **5**, 109, 1937.						
C 6665.....	1935 May 10	2427933.860	0.014	+36.3	c	0.6
6687.....	June 8	7962.319	.411	− 5.3	c	0.6
6753.....	July 9	7993.700	.631	+26.4	b	1.0
γ 20833.....	Oct. 19	8095.649	.274	− 9.1	c	0.6
20848.....	Nov. 5	8112.648	.551	+15.4	c	0.6
21032.....	1936 July 1	8351.793	.927	+26.9	c	0.6
C 6933.....	July 11	8361.899	.253	+29.3	c	0.4
6936.....	July 28	8378.774	.477	− 0.8	c	0.6
γ 21050.....	Aug. 2	8383.774	0.618	+41.9	c	0.6
SZ Monocerotis $6^h46^m25^s$, $-1°15'$; 10.4–11.4 vis.						
Max. = JD 2425232.4 + $16^d.382E$						
Elements by Dubiago, *A.N.*, **239**, 16, 1930.						
C 6152.....	1932 Oct. 11	2426992.034	0.413	+66.0	c	0.4
6176.....	Nov. 9	7021.045	.184	+37.4	c	0.6
6193.....	1933 Jan. 4	7077.860	.652	+70.3	c	0.4
6594.....	1934 Dec. 14	7786.983	.938	− 5.4	c	0.4
γ 20739.....	1935 Apr. 20	7913.665	.671	+29.5	c	0.6
20861.....	Nov. 7	8114.040	.903	+ 2.1	c	0.6
20906.....	1936 Jan. 9	8177.768	.793	+ 6.4	c	0.6
20927.....	Feb. 5	8204.806	.443	+20.1	c	0.4
20970.....	Mar. 28	8256.674	.610	+28.6	c	0.4
21085.....	Nov. 5	8478.913	.176	+16.9	c	0.6
21096.....	Dec. 4	8507.870	.943	+27.7	c	0.6
21101.....	Dec. 5	8508.889	.005	+34.3	b	1.0
21106.....	1937 Jan. 4	8538.894	.837	+31.7	b	0.7
21107.....	Jan. 31	8565.702	.473	+56.0	c	0.6
21112.....	Feb. 1	8566.783	0.539	+66.6	c	0.6

TABLE 2—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
TZ Monocerotis $6^h52^m54^s$, $-0°15'$; 11.0–12.2 pg.						
Max. = JD 2425615.36 + $7^d.4284E$						
Elements by Oosterhoff, *Harvard Bull.*, No. 900, 11, 1935.						
γ 19266.....	1932 Nov. 10	2427022.002	0.360	+37.4	b	0.7
19278.....	Nov. 12	7024.006	.630	52.8	b	.3
C 6192.....	1933 Jan. 4	7077.828	.875	50.6	c	.6
6606.....	1934 Dec. 16	7788.000	.478	23.5	c	.4
γ 20702.....	1935 Feb. 14	7848.774	.659	40.7	c	.2
20907.....	1936 Jan. 9	8177.801	.952	27.3	c	.6
20923.....	Feb. 4	8203.860	.460	36.1	c	.4
21108.....	1937 Jan. 31	8565.781	0.189	+47.7	c	0.6
XX Monocerotis $6^h47^m11^s$, $-2°41'$; 11–12 pg.						
C 6202.....	1933 Jan. 5	2427078.885	.....	+85.0	c	0.2
6652.....	1935 Apr. 12	7905.684	.....	44.9	c	.2
γ 20908.....	1936 Jan. 9	8177.832	.....	43.9	c	.6
C 6980.....	Oct. 24	8466.974	.....	67.2	c	.2
γ 21086.....	Nov. 6	8479.008	.....	+63.3	c	0.4
VW Puppis $7^h27^m25^s$, $-19°56'$; 11.2–12.1 vis.						
Max. = JD 2425184.67 + $4^d.28405E$						
Elements by Oosterhoff, *Harvard Bull.*, No. 900, 11, 1935.						
C 6237.....	1933 Apr. 5	2427168.694	0.119	− 3.0	c	0.2
6353.....	Dec. 25	7432.875	.785	+43.9	c	.4
6367.....	1934 Feb. 20	7489.740	.058	+16.0	c	.2
6626.....	1935 Mar. 16	7878.667	.843	+29.5	c	.4
γ 20909.....	1936 Jan. 9	8177.890	.689	+34.0	c	.4
C 6892.....	Apr. 11	8270.663	0.345	+29.5	c	0.4
VX Puppis $7^h28^m19^s$, $-21°43'$; 7.8–9.4 pg.						
Max. = JD 2426961.2 + $3^d.012E$						
Elements by O'Connell, *Riverview Pub.*, **1**, 15, 1935.						
γ 19401.....	1933 Jan. 3	2427076.875	0.405	+32.1	b	1.0
C 6236.....	Apr. 5	7168.628	.867	− 1.5	c	0.6
γ 20066.....	Nov. 30	7407.927	.316	+ 7.7	b	1.0
20107.....	Dec. 27	7434.936	.283	− 4.0	b	1.0
20152.....	1934 Jan. 26	7464.795	0.196	− 4.3	c	0.6

TABLE 2—*Continued*

Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
VX Puppis—*Continued*						
C 6633.....	1935 Mar. 17	7879.689	0.943	+12.6	b	1.0
γ 20897.....	1936 Jan. 6	8174.896	.954	− 5.3	b	1.0
C 6837.....	Feb. 2	8201.862	.906	− 5.3	c	0.6
γ 20948.....	Mar. 4	8232.766	.167	+ 8.5	b	1.0
20969.....	Mar. 28	8256.626	.088	+ 2.0	b	1.0
21097.....	Dec. 4	8507.955	.531	+25.1	c	0.6
21102.....	Dec. 5	8508.956	0.863	+ 2.4	b	1.0
AP Puppis $7^h54^m18^s$, $-39°51'$; 7.6–8.7 pg.						
Max. = JD 2427341.25 + $5^d.084E$						
Elements by O'Leary, *A.N.*, **257**, 391, 1935.						
C 6985.....	1937 Feb. 17	2428582.773	0.196	+41.2	c	0.2
7005.....	Mar. 19	8612.684	.079	37.4	c	.2
7010.....	Mar. 20	8613.661	.272	25.1	c	.4
7023.....	Apr. 21	8645.656	.565	49.4	c	.2
7027.....	Apr. 22	8646.653	0.761	+52.4	c	0.2
AQ Puppis $7^h54^m20^s$, $-28°52'$; 9.0–10.9 pg.						
Max. = JD 2427519.14 + $22^d.92E$						
Elements by O'Leary and O'Connell, *A.N.*, **259**, 399, 1936.						
C 6216.....	1933 Mar. 2	2427134.772	0.153	+15.5	c	0.4
6623.....	1935 Feb. 10	7844.847	.886	56.5	c	.4
6627.....	Mar. 16	7878.729	.018	35.5	c	.6
6981.....	1936 Oct. 25	8467.024	.681	63.6	c	.6
6984.....	1937 Feb. 17	8582.729	0.548	+37.0	c	0.2
AT Puppis $8^h8^m40^s$, $-36°39'$; 8.0–9.4 pg.						
Max. = JD 2426758.205 + $6^d.66481E$						
Elements by O'Connell, *A.N.*, **257**, 391, 1935.						
C 6986.....	1937 Feb. 17	2428582.830	0.770	+33.7	c	0.4
7006.....	Mar. 19	8612.719	.254	12.3	c	.6
7011.....	Mar. 20	8613.701	.402	33.8	c	.6
7020.....	Apr. 20	8644.685	0.051	+ 9.7	c	0.4

TABLE 2—*Continued*

	Plate	Date	JD	Phase	Vel. Km/Sec	Disp.	Wt.
	V 377 Sagittarii $18^h42^m14^s$, $-20°14'$; 13.6–15.0 pg.						
	Max. = JD 2426077.535 + $16^d.17076E$						
	Elements by Martin, *B.A.N.*, **6**, 232, 1932.						
C	6270.....	1933 July 2	2427256.903	0.932	+29.4	c	0.2
	6539.....	1934 Sept. 19	7700.685	.376	−22.4	c	.2
	6543.....	Sept. 20	7701.688	0.438	−29.1	c	0.2
	V 410 Sagittarii $19^h0^m13^s$, $-18°33'$; 12.6–14.1 pg.						
	Max. = JD 2426082.83 + $13^d.7835E$						
	Elements by Martin, *B.A.N.*, **6**, 232, 1932.						
C	6078.....	1932 July 23	2426912.809	0.216	−29.4	c	0.2
	6110.....	Aug. 23	6943.740	.460	0.0	c	.2
	6272.....	1933 July 13	7267.835	.973	+19.5	c	.6
	6447.....	1934 June 23	7612.885	0.006	+15.7	c	0.4
	BW Scuti $18^h42^m3^s$, $-4°52'$; 11.8–13.6 pg.						
	Max. = JD 2413752.67 + $3^d.823E$						
	Elements by Harwood, *Harvard Bull.*, No. 880, 12, 1930.						
C	6262.....	1933 June 30	2427254.924	0.848	+20.6	c	0.4
	6286.....	Aug. 1	7286.823	.192	− 1.3	c	.2
	6300.....	Aug. 31	7316.750	.020	+ 4.5	c	.2
	6761.....	1935 July 10	7994.927	.414	− 8.8	c	.2
	6944.....	July 30	8380.823	.354	−19.7	c	.4
	6958.....	Sept. 8	8420.760	0.801	+14.5	c	0.4
	AA Serpentis $18^h36^m11^s$, $-1°12'$; 13.8–15.4 pg.						
	Max. = JD 2425475.68 + $17^d.155E$						
	Elements by Oosterhoff, *Harvard Bull.*, No. 900, 12, 1935.						
C	6132.....	1932 Sept. 12	2426963.722	0.741	−56.7	c	0.4
	6470.....	1934 July 23	7642.844	.328	+25.0	c	.2
	6698.....	1935 June 11	7965.844	.157	+24.9	c	.2
	6755.....	July 9	7993.872	.790	−46.7	c	.4
	6960.....	1936 Sept. 9	8421.712	0.720	−28.8	c	0.4

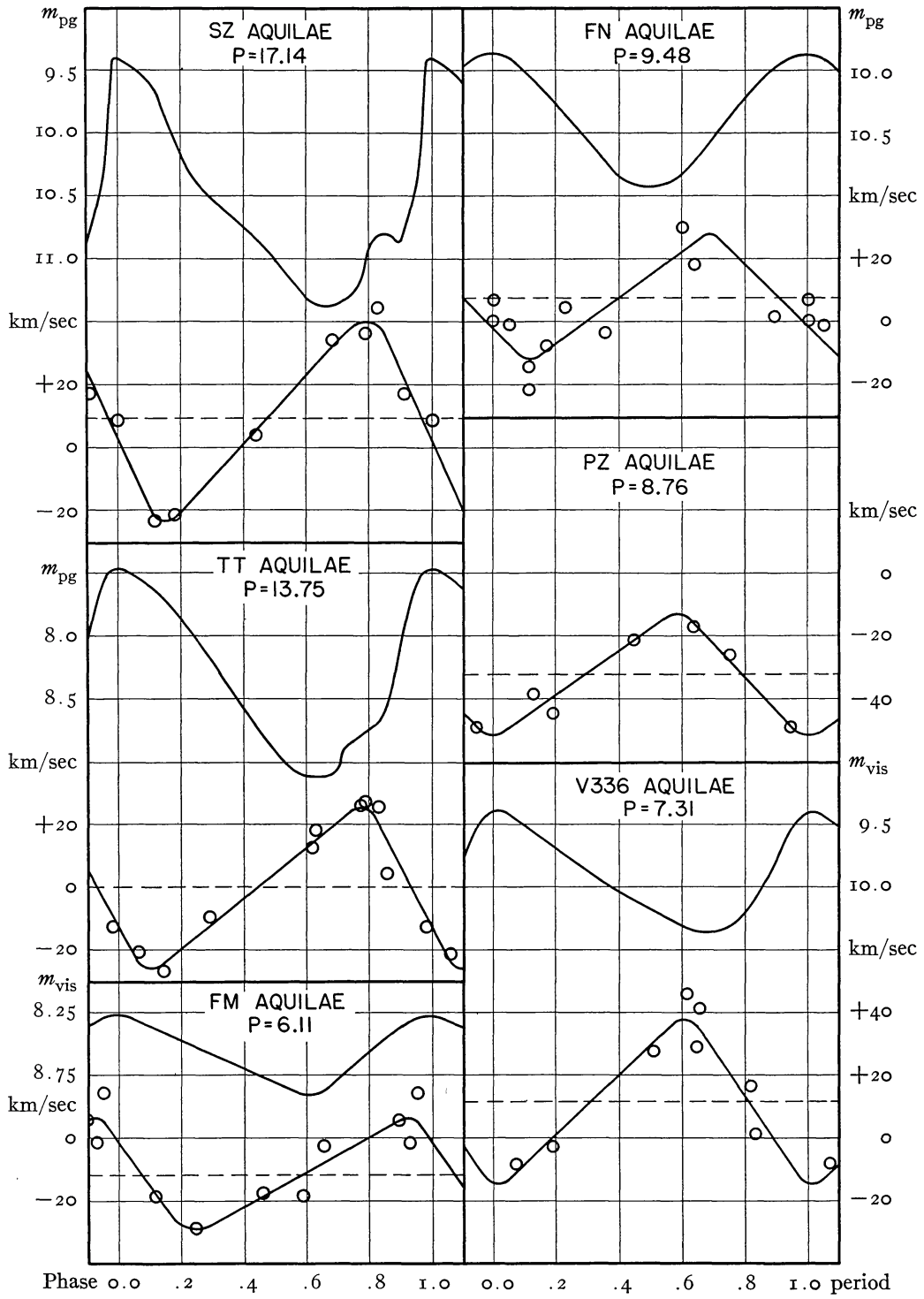

FIG. 1.—Light- and velocity-curves

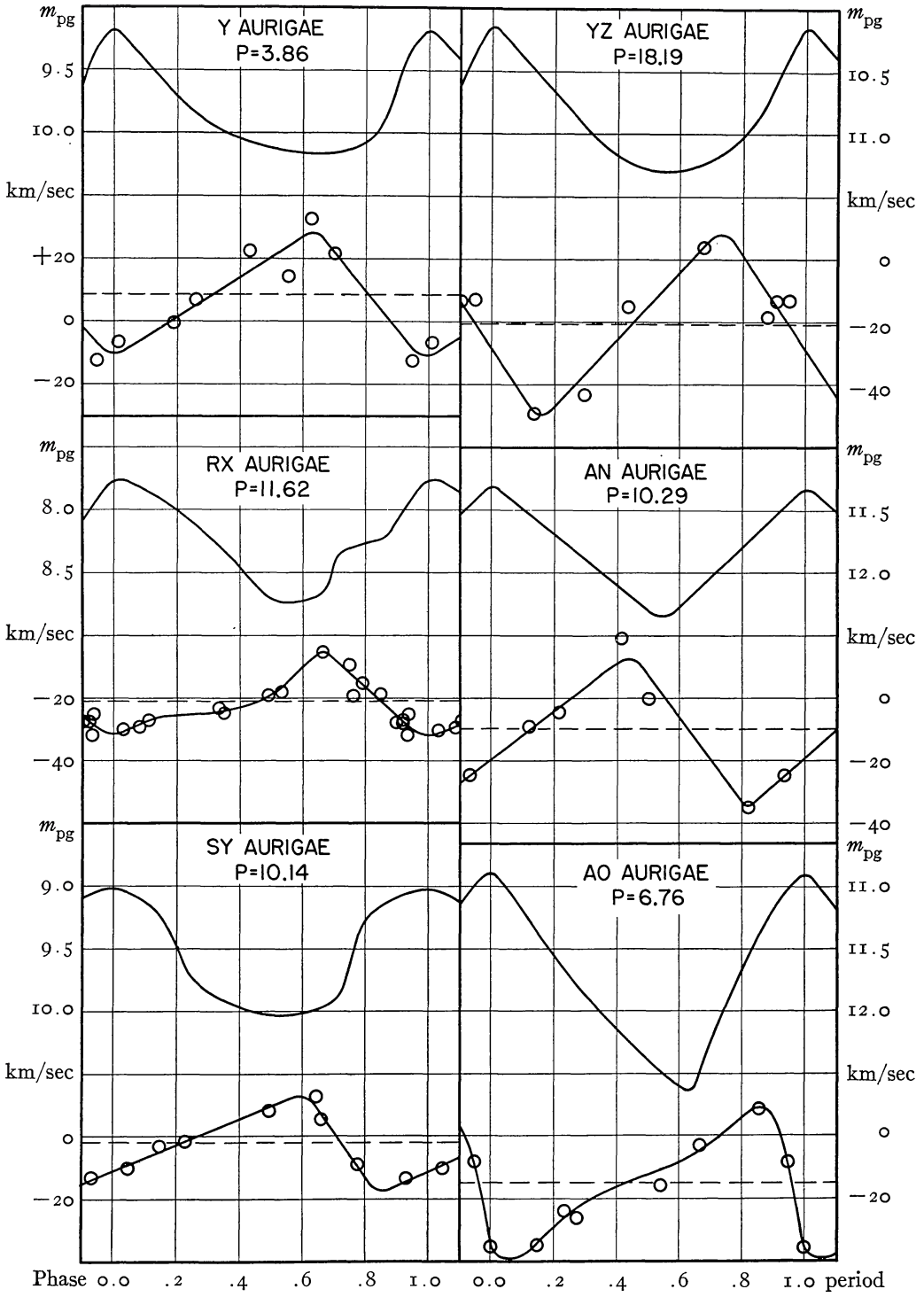

FIG. 2.—Light- and velocity-curves

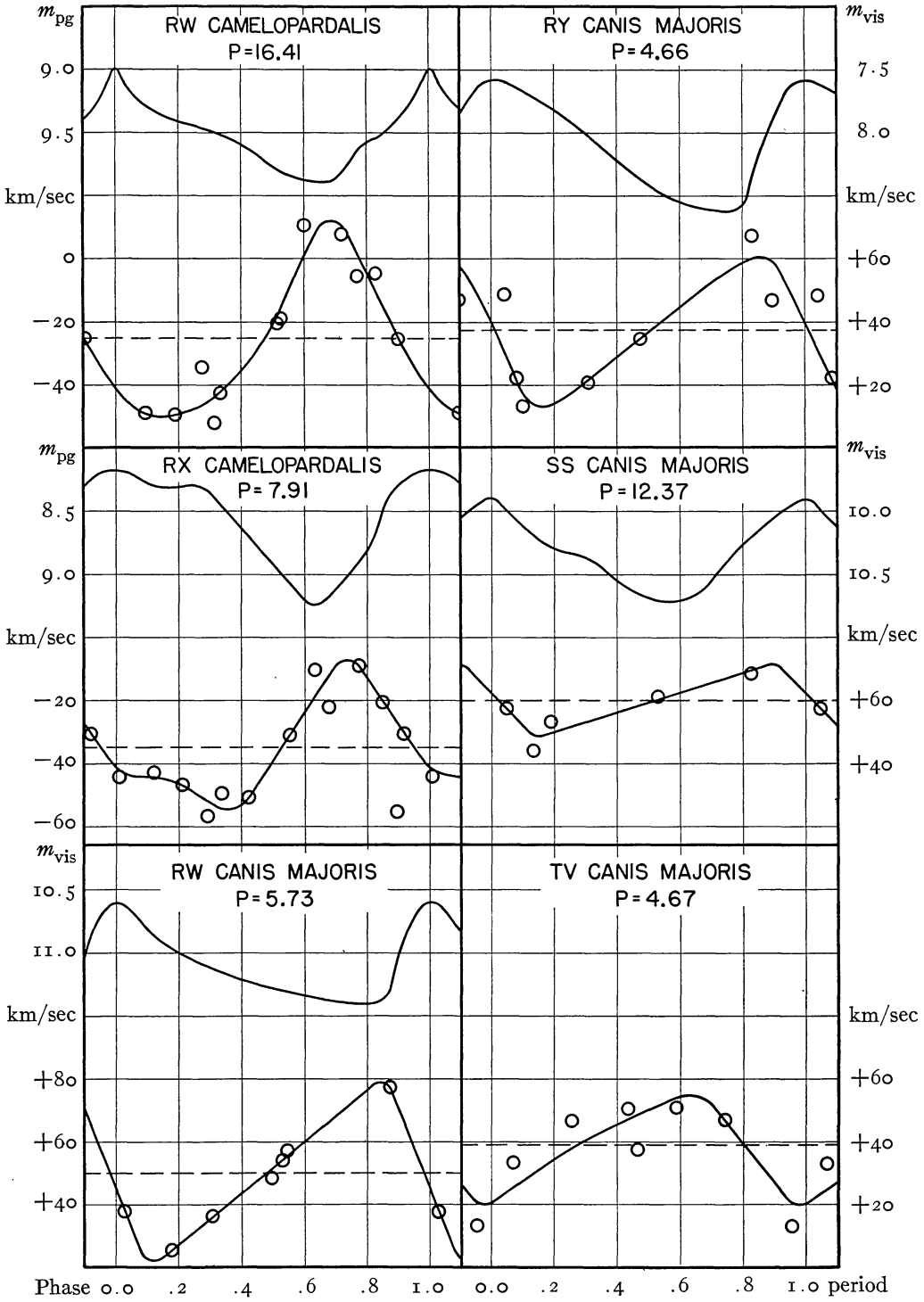

FIG. 3.—Light- and velocity-curves

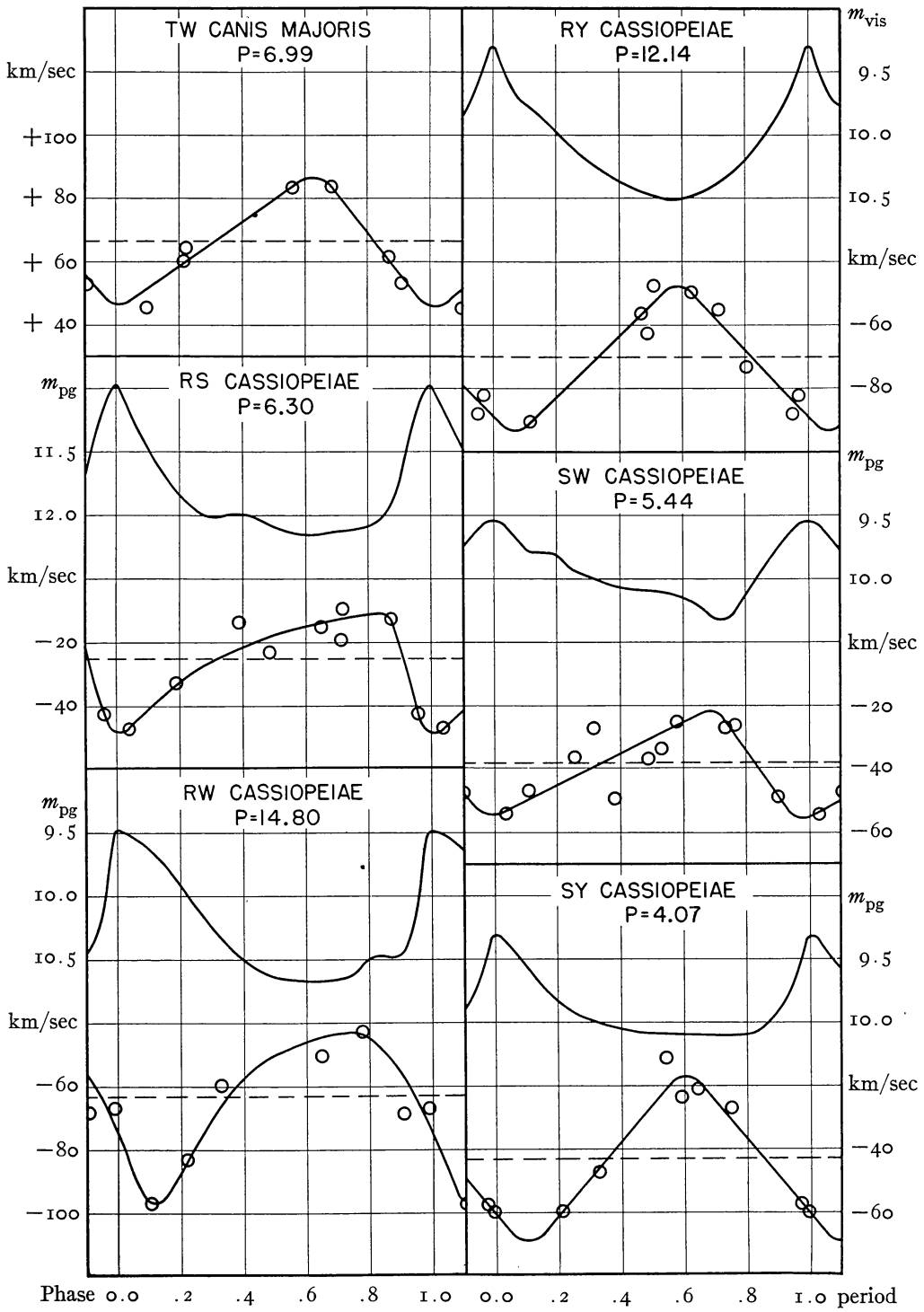

FIG. 4.—Light- and velocity-curves

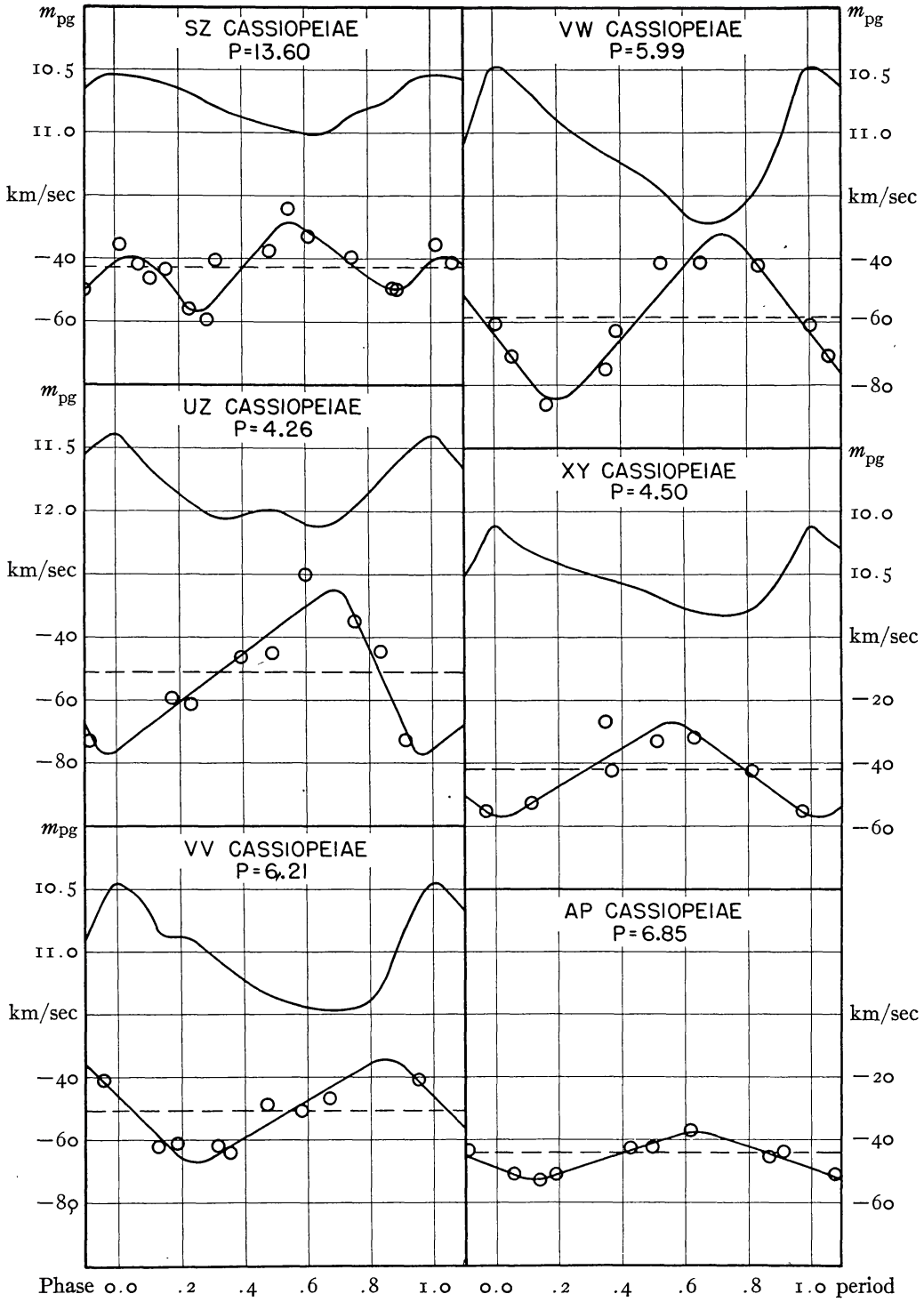

FIG. 5.—Light- and velocity-curves

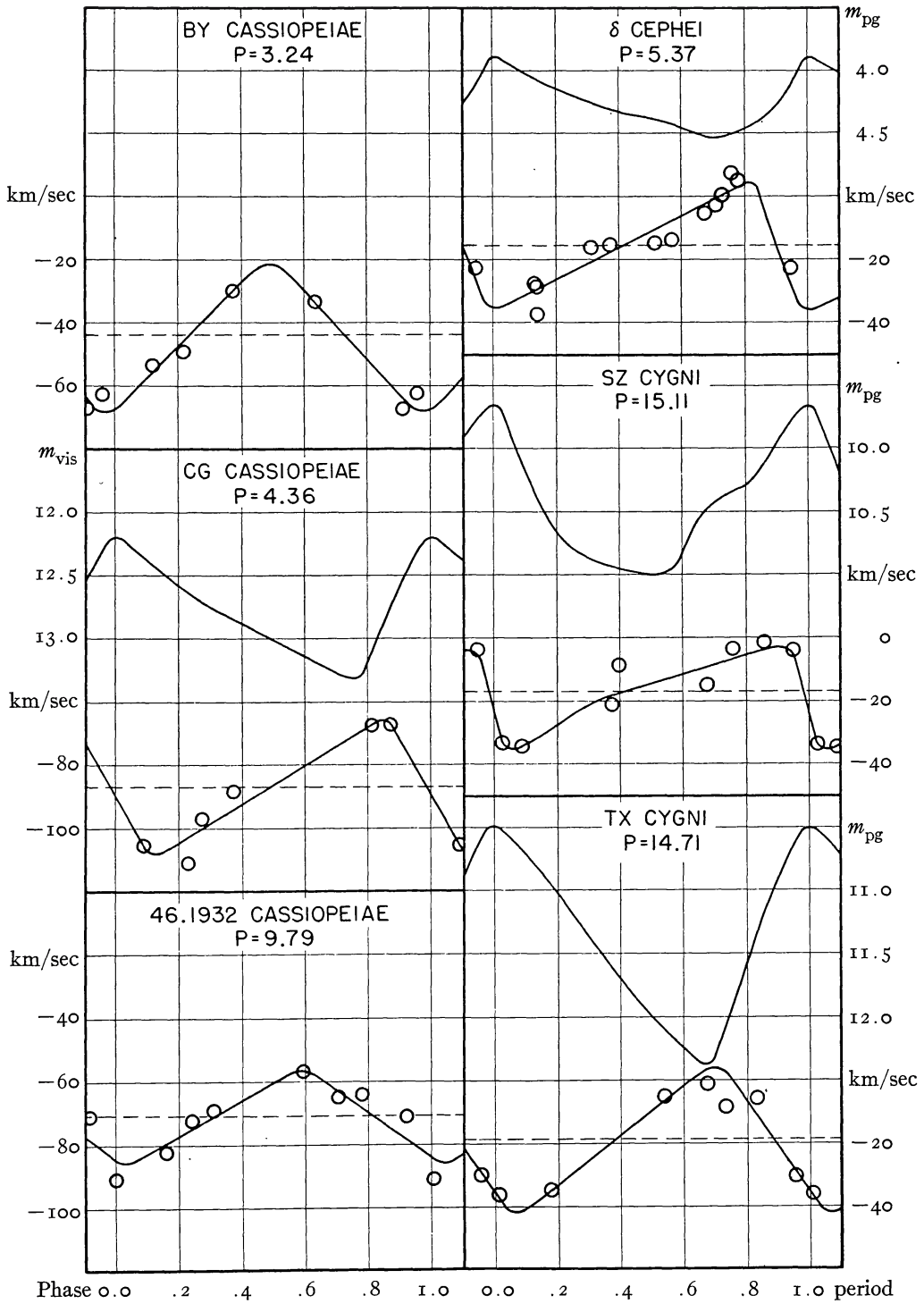

FIG. 6.—Light- and velocity-curves

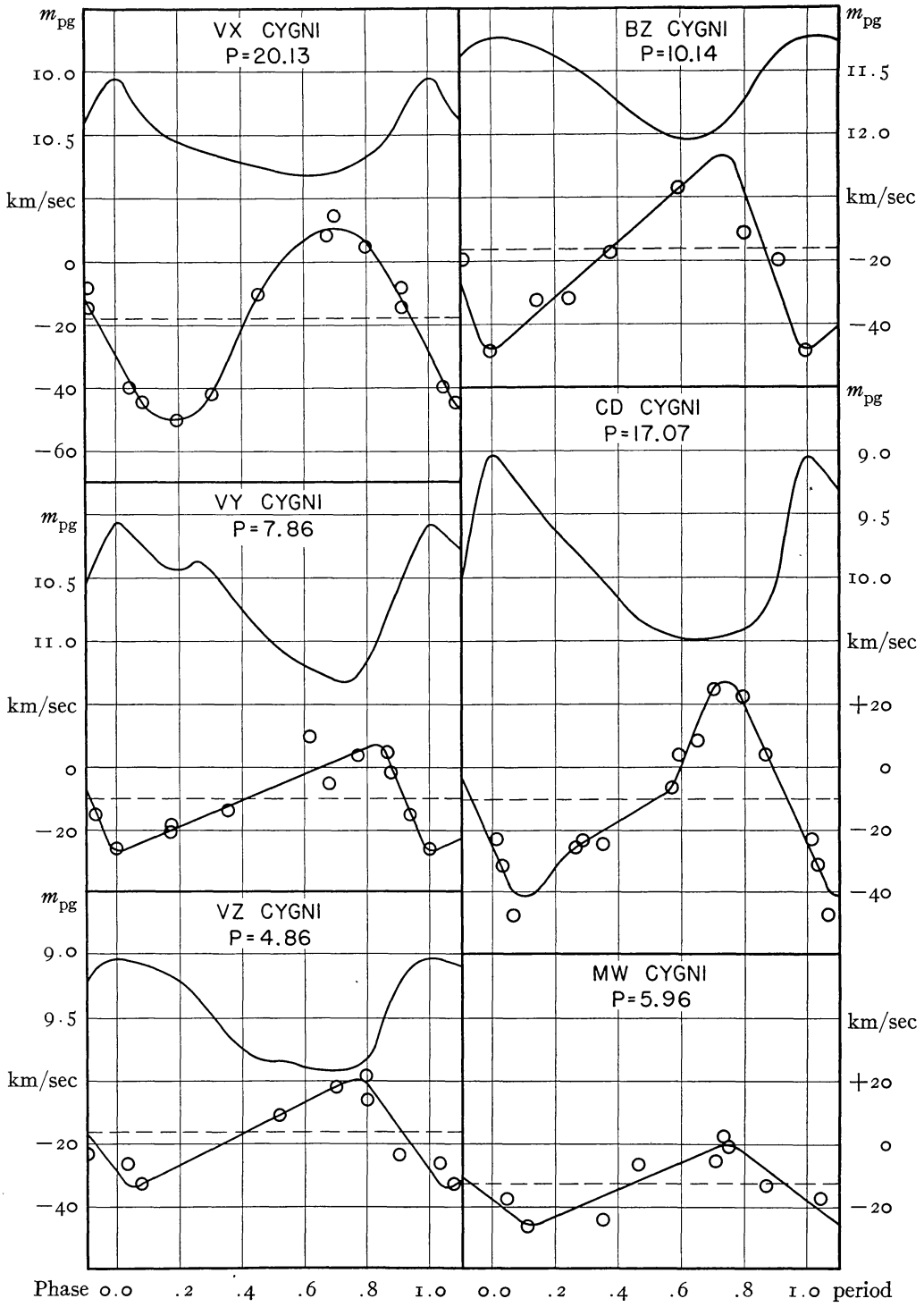

FIG. 7.—Light- and velocity-curves

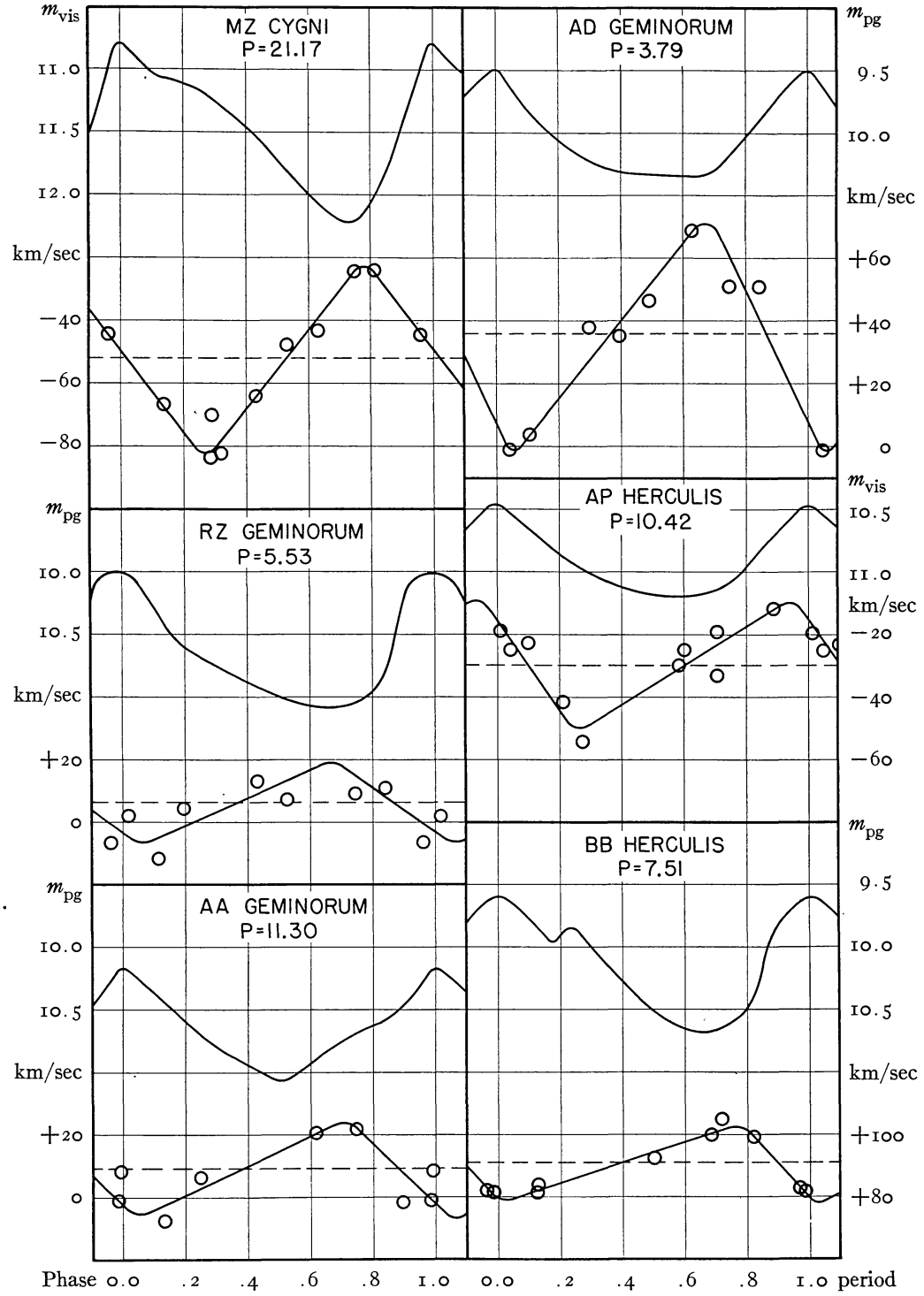

FIG. 8.—Light- and velocity-curves

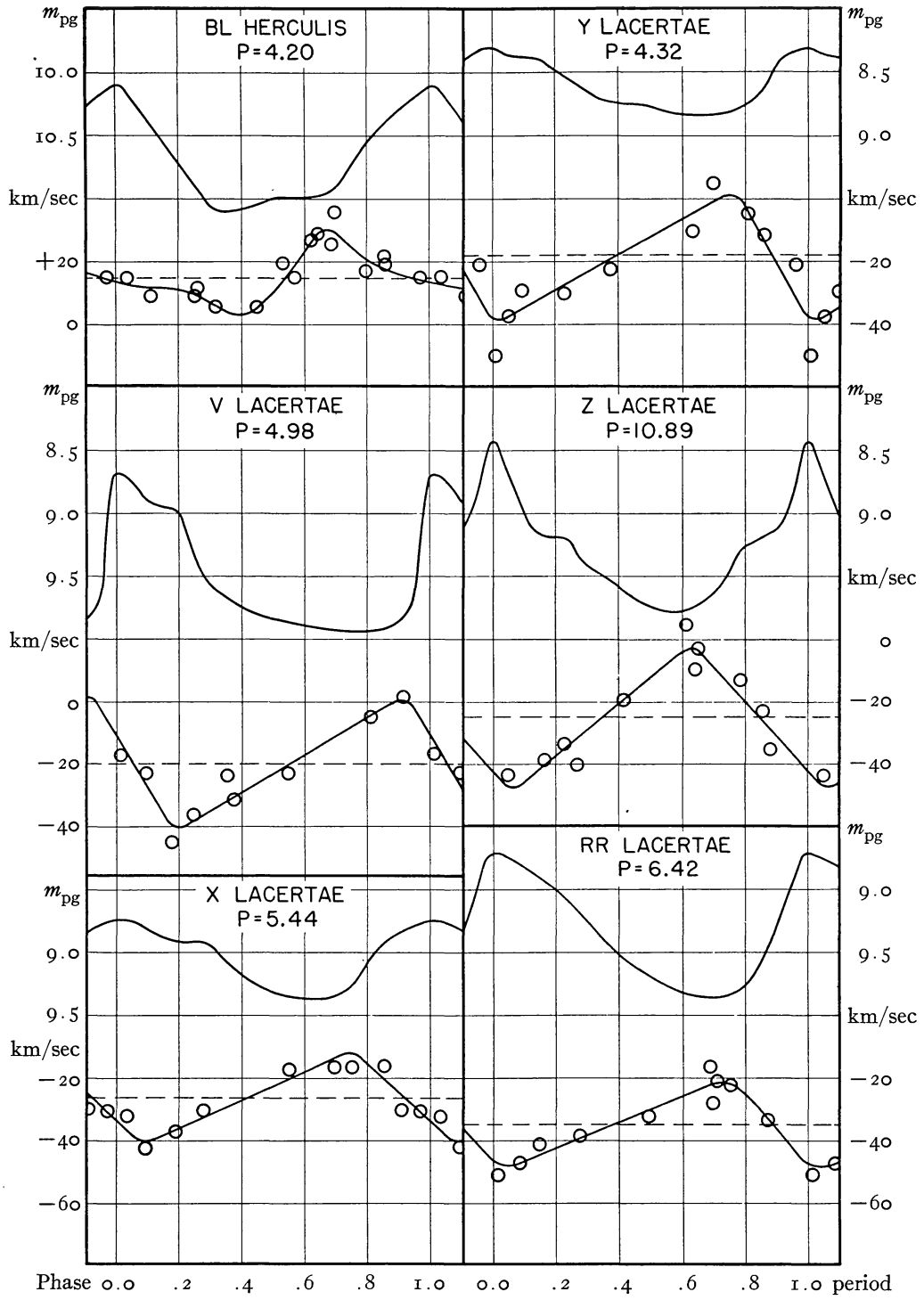

FIG. 9.—Light- and velocity-curves

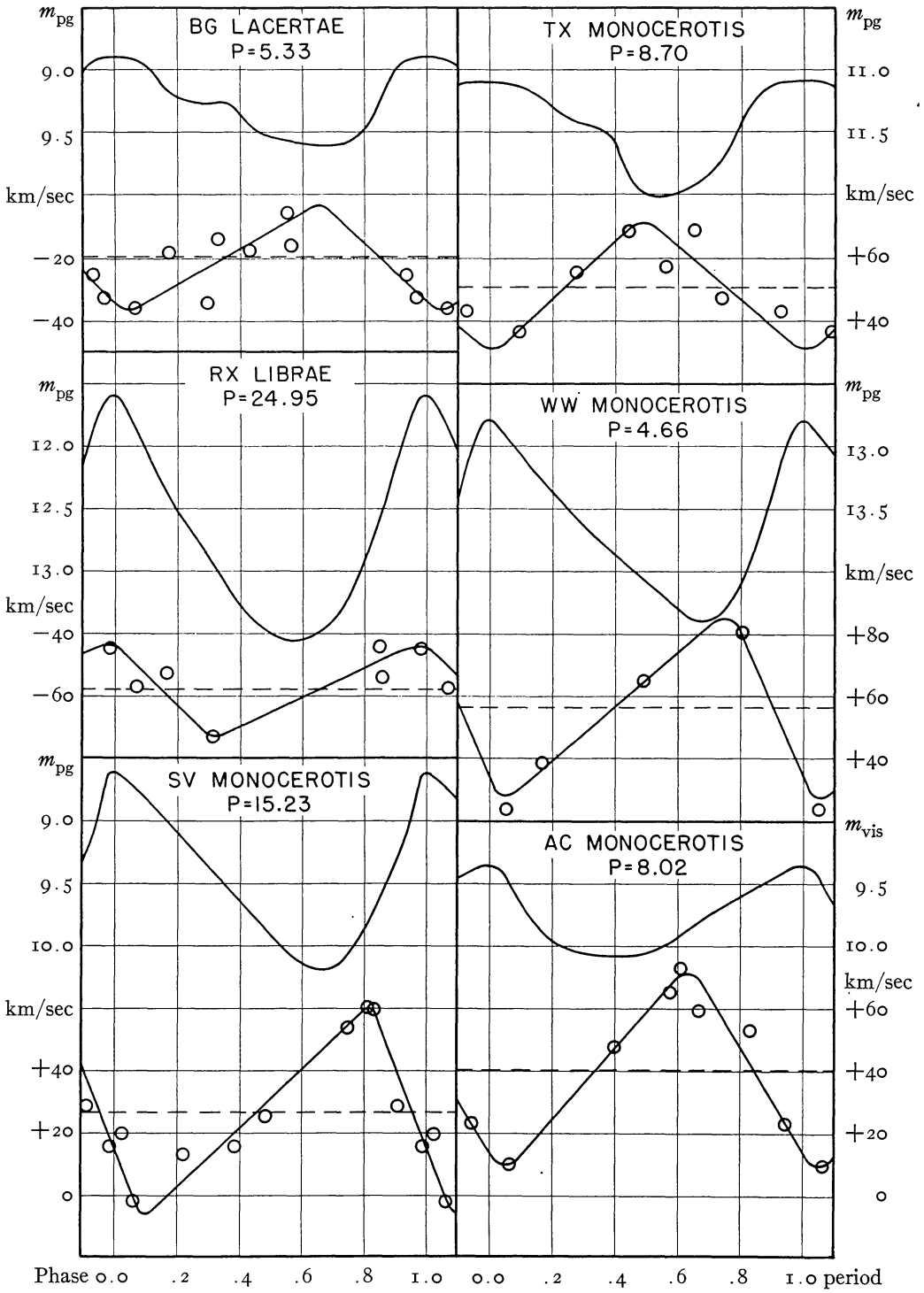

FIG. 10.—Light- and velocity-curves

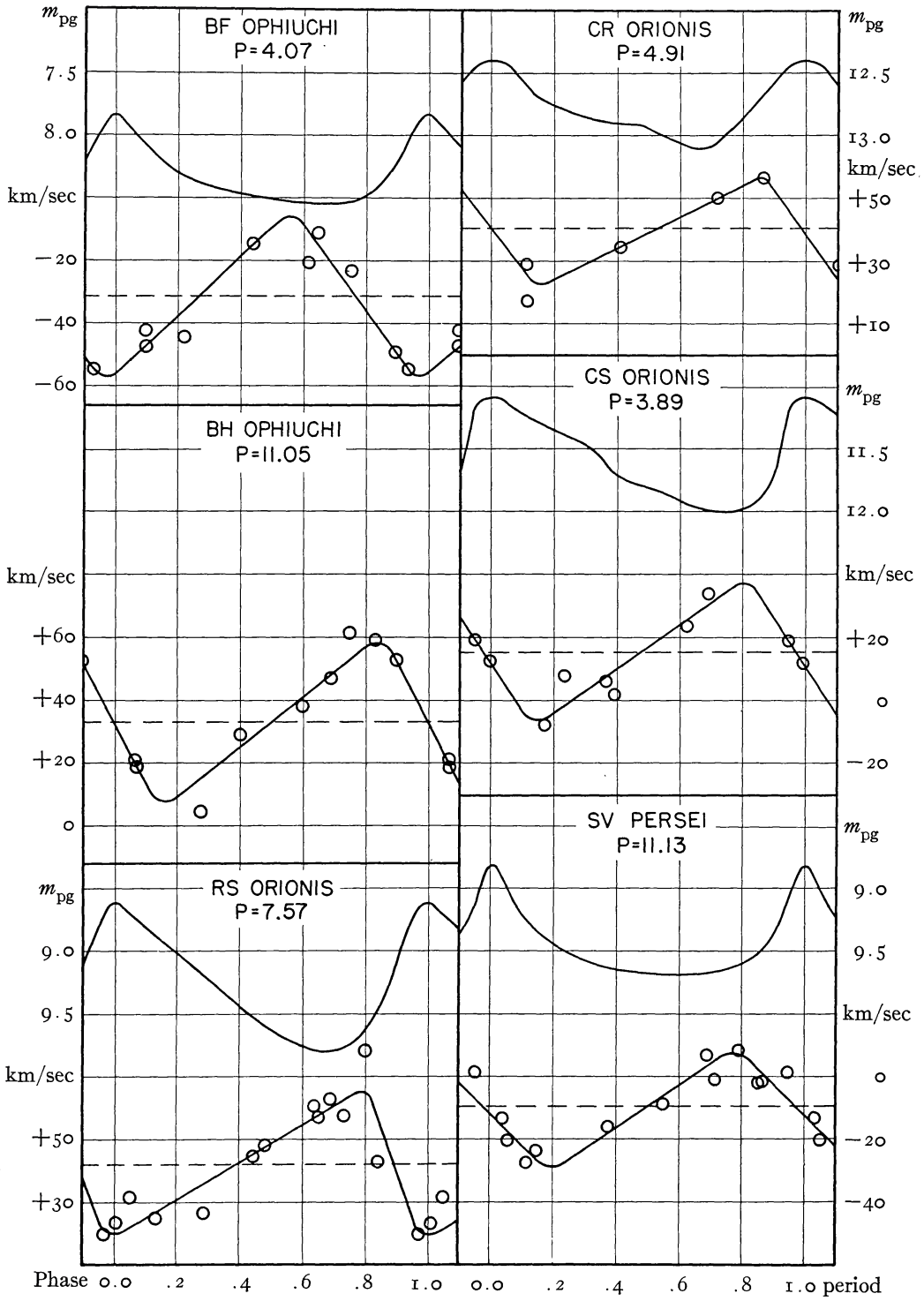

FIG. 11.—Light- and velocity-curves

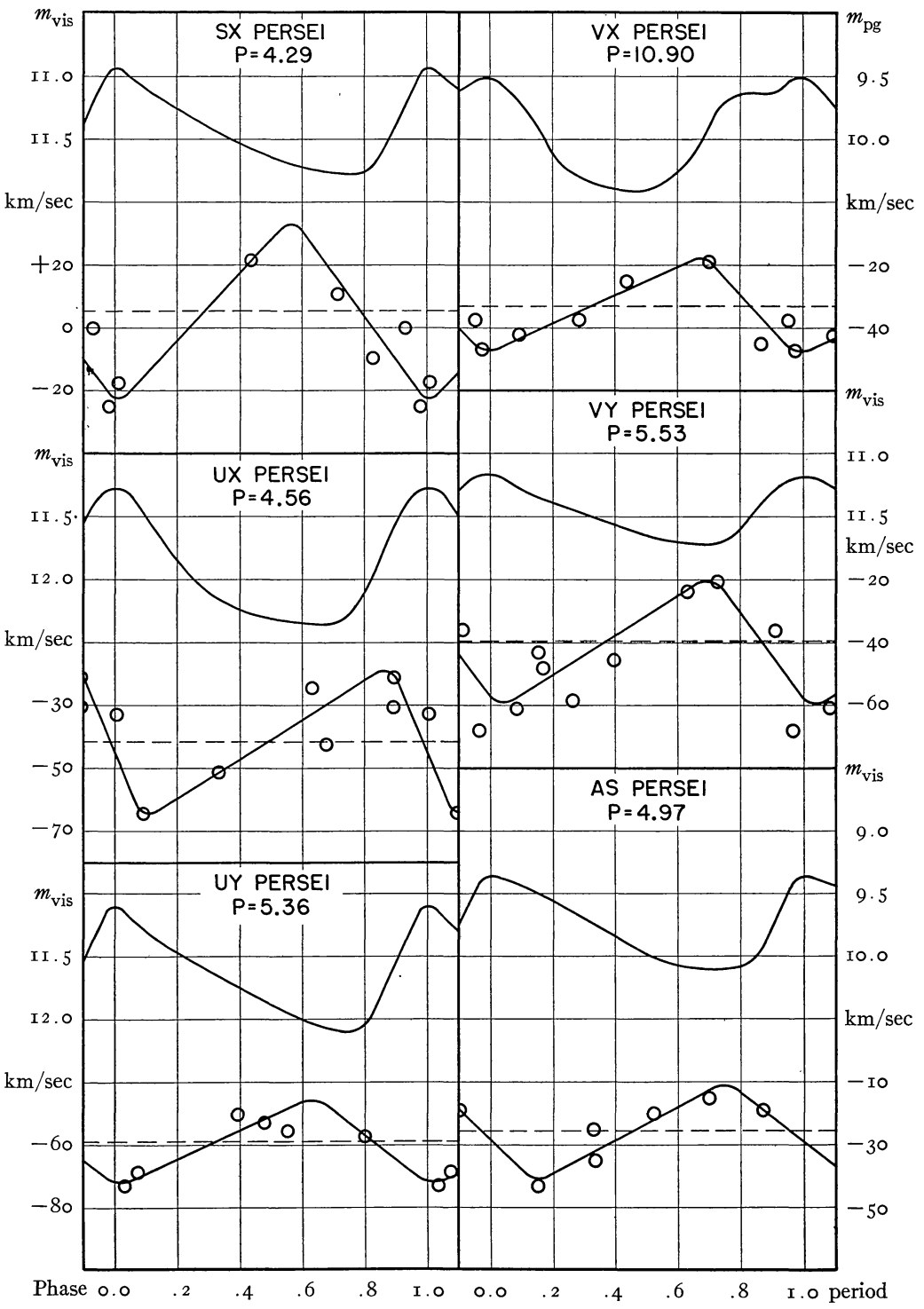

FIG. 12.—Light- and velocity-curves

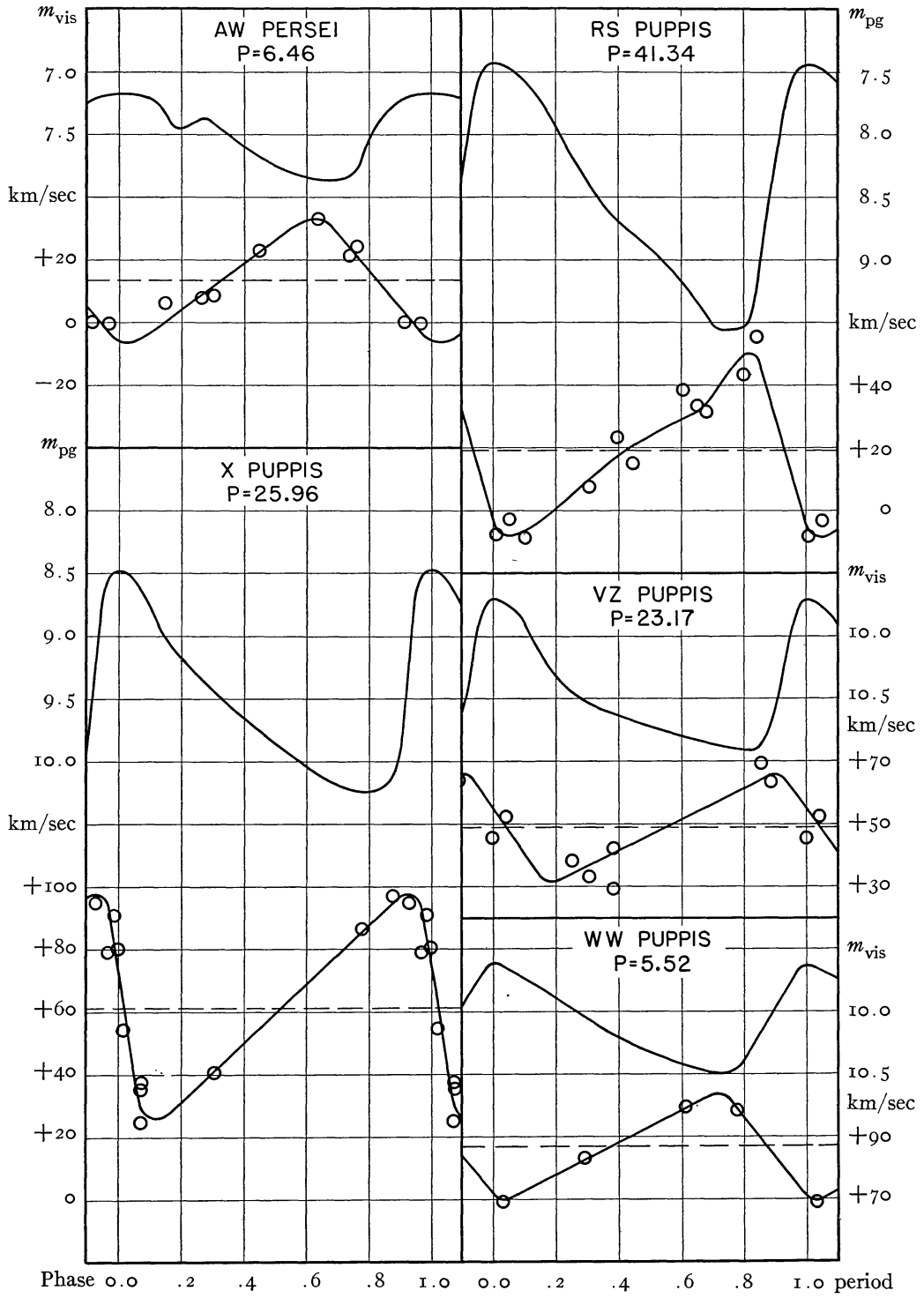

FIG. 13.—Light- and velocity-curves

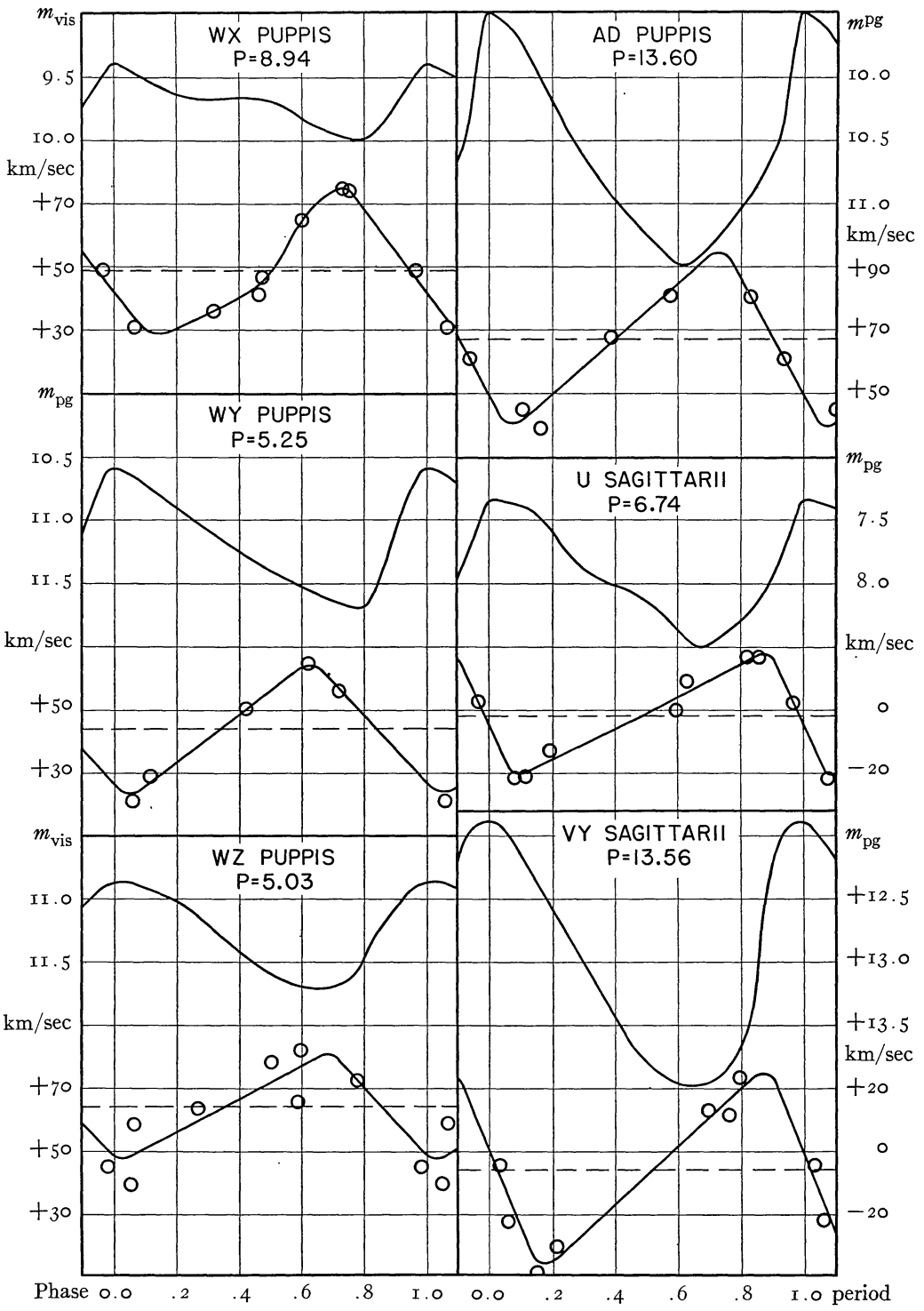

FIG. 14.—Light- and velocity-curves

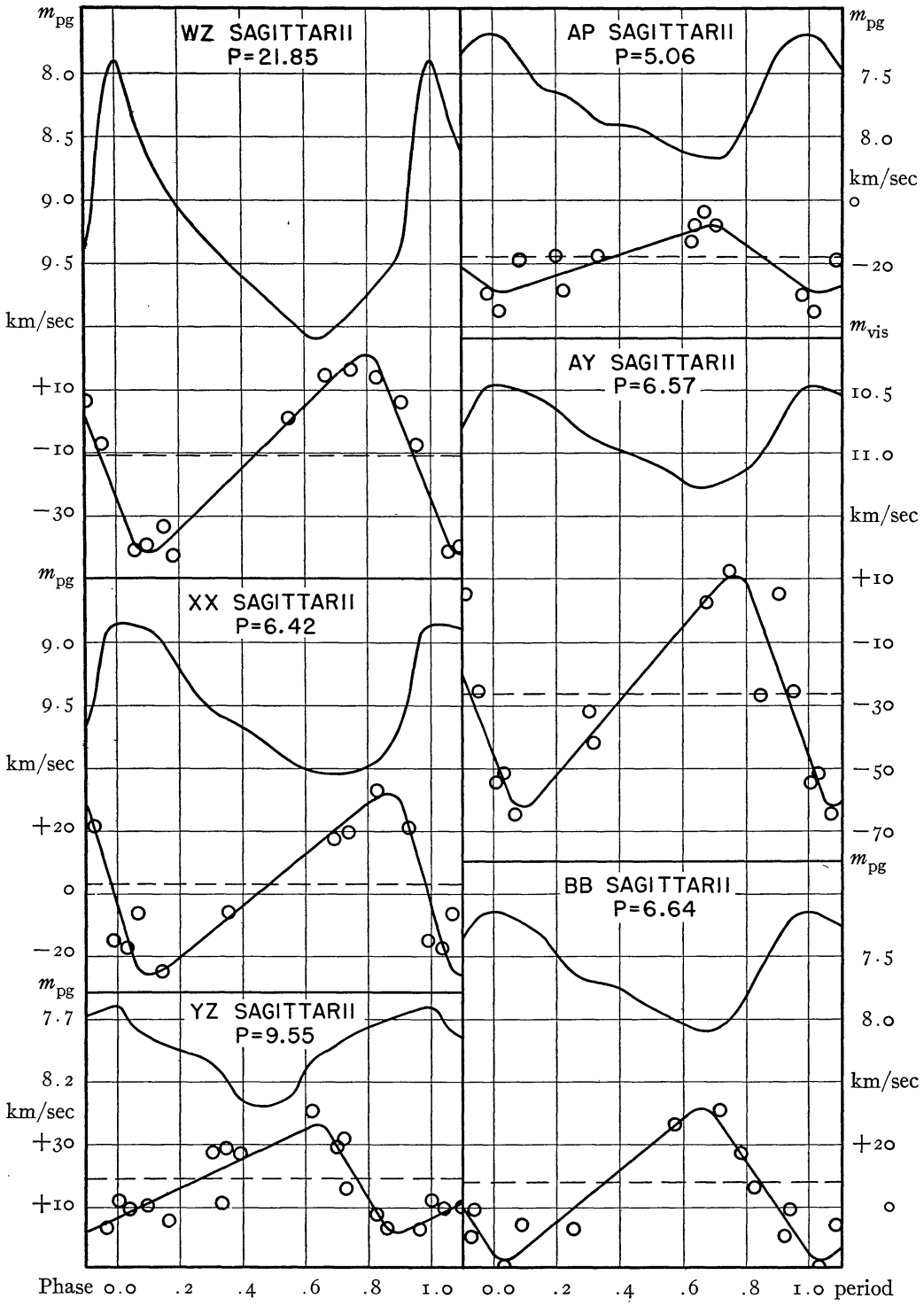

FIG. 15.—Light- and velocity-curves

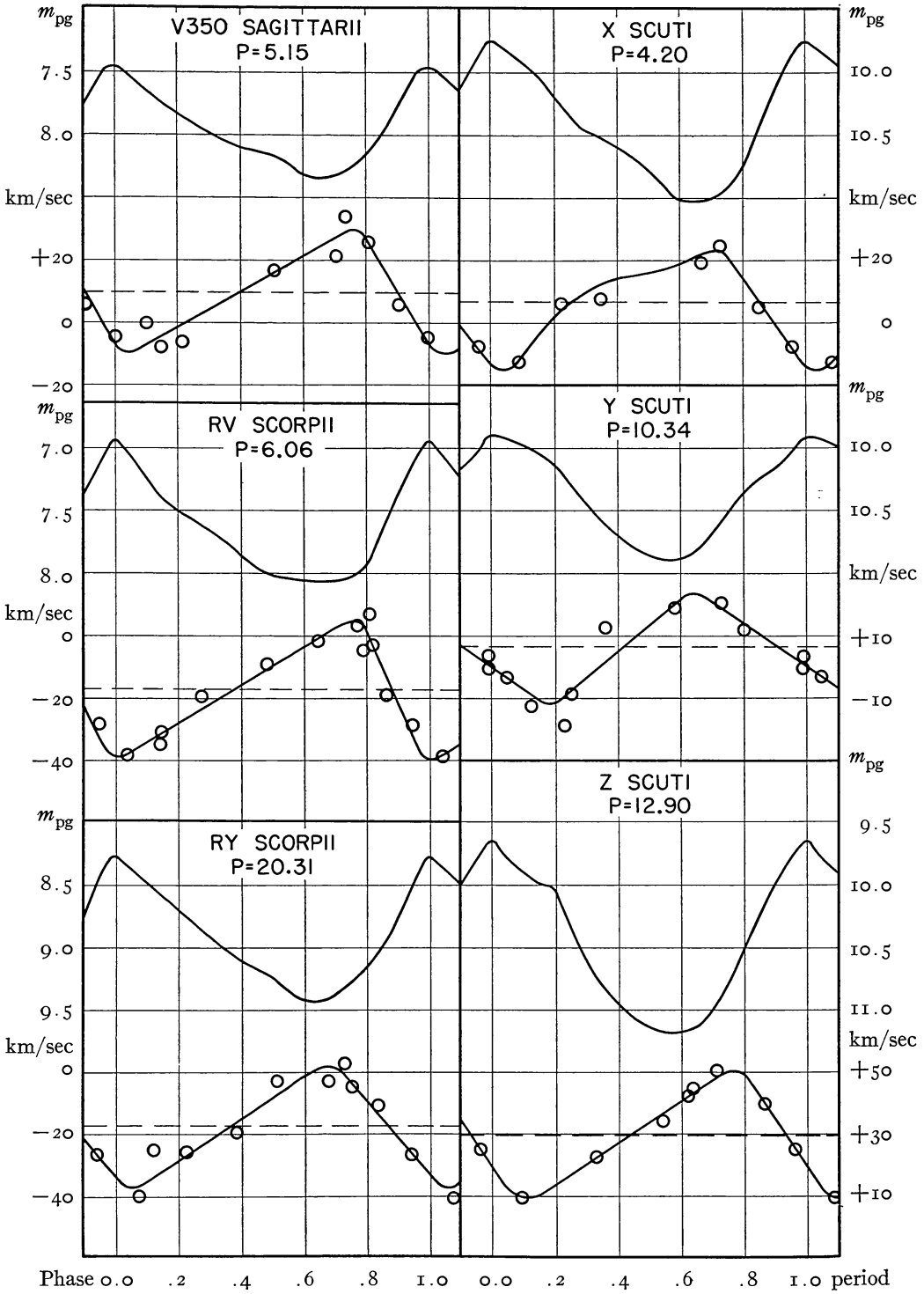

FIG. 16.—Light- and velocity-curves

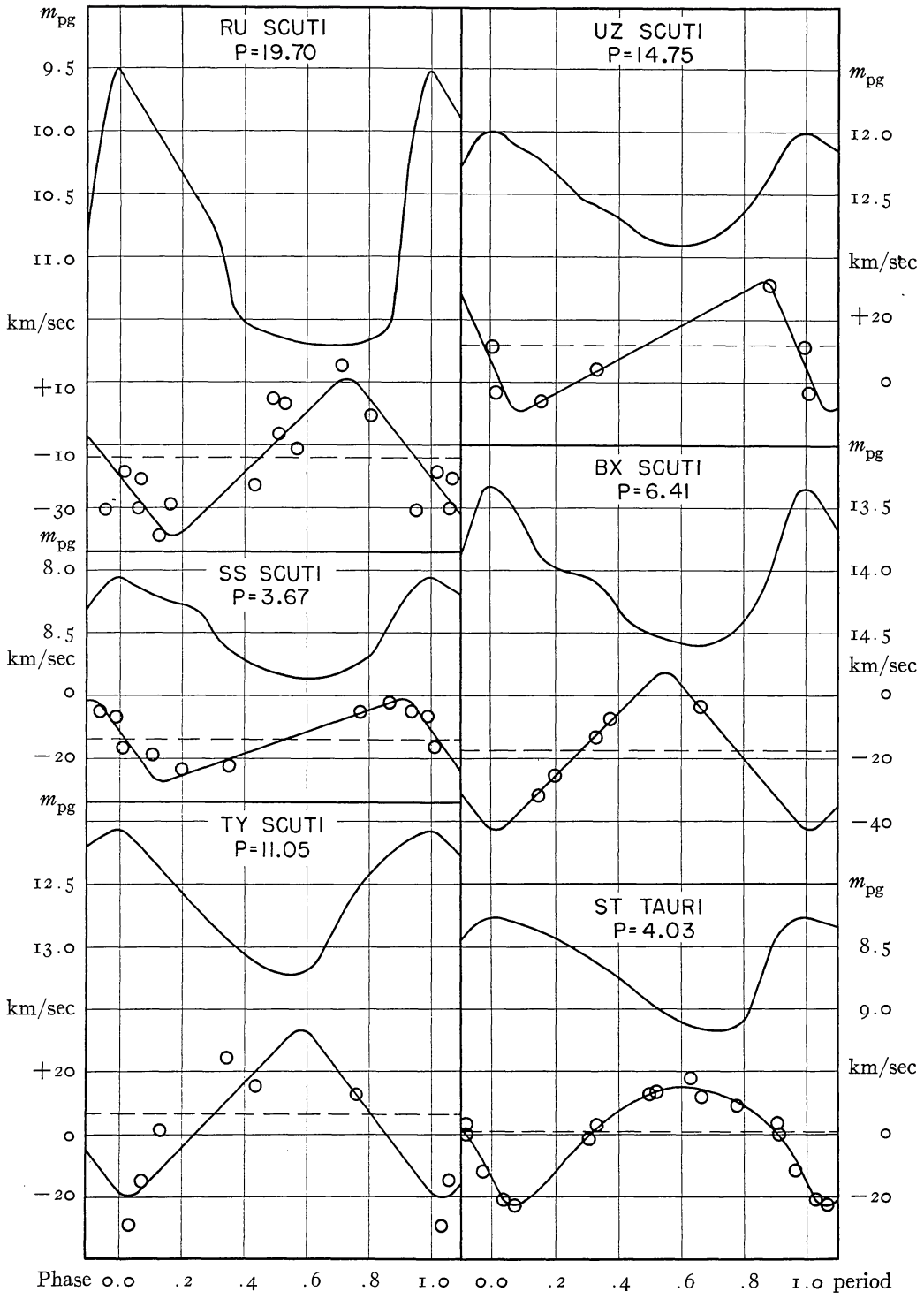

FIG. 17.—Light- and velocity-curves

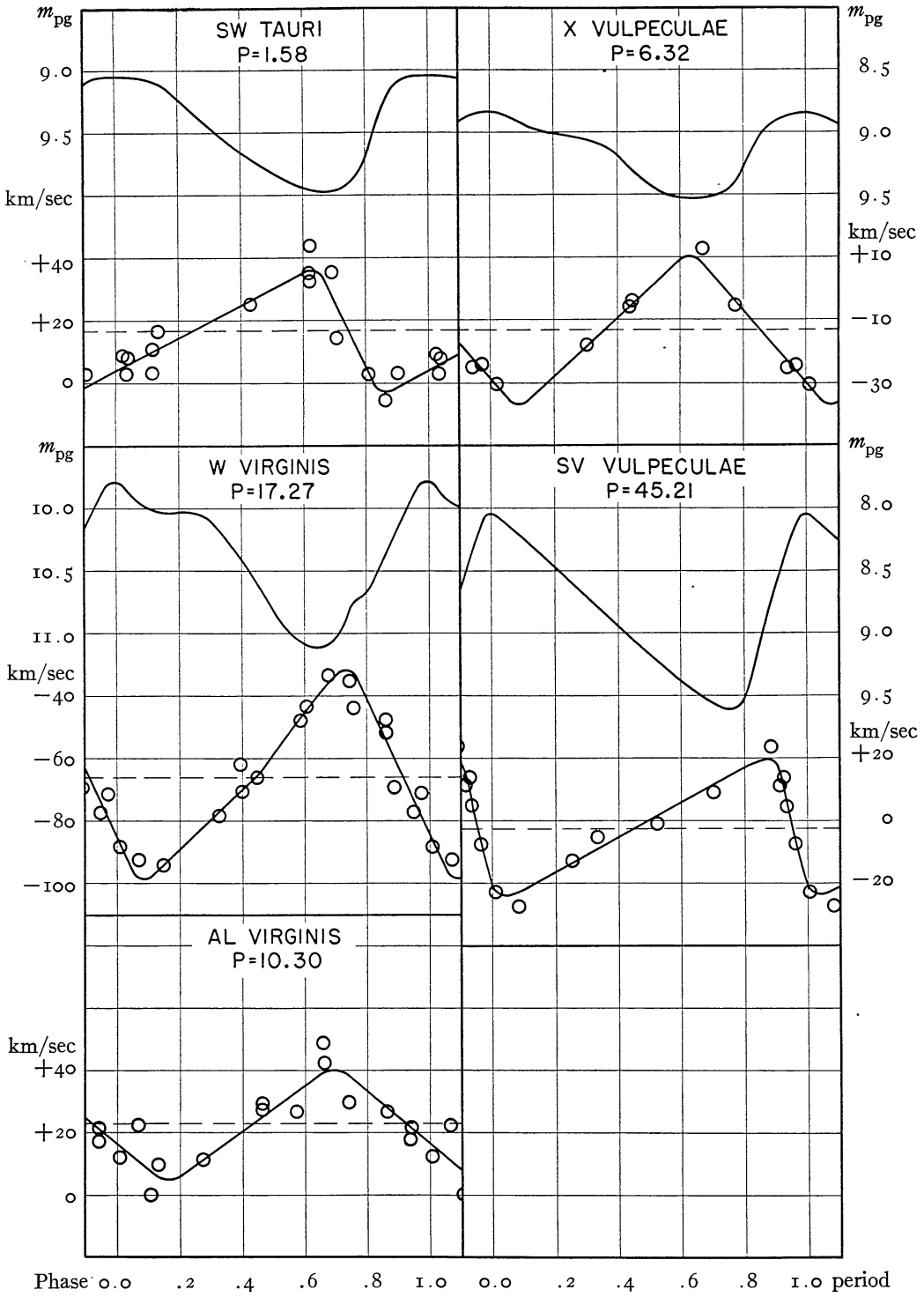

FIG. 18.—Light- and velocity-curves

In Table 4 the various data available for 155 Cepheids observed here and elsewhere are collected. Most of the columns need no explanation. The fifth and tenth give, in percentage of the period, the time from minimum to maximum light and from greatest velocity of recession to greatest velocity of approach, respectively. The eighth

TABLE 3

COMPARISON OF LICK AND MOUNT WILSON VELOCITIES

Star	Mag.	Spec.	Lick Vel.	Mt. W. Vel.	Diff.	No. of Plates
			km/sec	km/sec		
Boss 772	1.9	cF4	− 2.1	− 1.4	+0.7	4
1806	5.2	cG2	− 8.1	− 6.9	+1.2	6
4443	3.0	cG2	−20.9	−20.1	+0.8	13
4707	5.0	cF8	−11.3	− 9.8	+1.5	14
5229	2.3	cF7	− 5.4	− 1.3	+4.1	1
5255	4.1	cF4	−18.6	−14.6	+4.0	2
5676	3.2	cG1	+ 7.6	+ 3.3	−4.3	4
6135	4.8	cG0	−42.5	−46.5	−4.0	11

and ninth show the lag of the velocity-curve at maximum and minimum of light, respectively, also in percentage of the period. Positive signs indicate that the extreme values of the velocity-curve occur later than the corresponding extremes of the light-curve. The values in these four columns were read directly from the curves of light and velocity when plotted according to decimal fractions of the period.

TABLE 4

CHARACTERISTIC DATA OF CEPHEID LIGHT- AND VELOCITY-CURVES

Star	Period	Median m_{pg}	Light Range	Light $M-m$	Normal Vel.	Vel. Range	Vel. Lag at Max. Light	Vel. Lag at Min. Light	Vel. ϵ
	days		mag. pg.	% per.	km/ sec	km/ sec	% per.	% per.	% per.
U Aql.	7.02	7.3	0.7	33	− 7.0	41.6	+ 2	+ 5	30
SZ Aql.	17.14	10.4	2.0	34	+ 9.5	64	+15	+13	35
TT Aql.	13.75	8.3	1.7	36	0.0	52	+10	+14	32
FF Aql.	4.47	6.0	0.6	45	−14.4	14.2	+ 7	+ 6	36
FM Aql.	6.11	9.6	1.2	39	−12.0	35	+24	+31	31
FN Aql.	9.48	10.4	1.0	50	+ 8.0	40	+12	+17	44
KL Aql.	6.10	10.0	1.6	33	− 2.5	32	.....	.....	.....
PZ Aql.	8.76	13.0	1.1	40	−32.0	39	0	− 2	42
V 336 Aql.	7.31	10.8	1.1	32	+11.5	53	+ 1	− 8	41
η Aql.	7.18	5.0	1.6	32	−15.1	41.7	+ 6	+14	24
Y Aur.	3.86	9.7	1.0	34	+ 8.5	39	0	− 3	36
RT Aur.	3.73	6.0	1.3	27	+21.4	.....	+ 7	+14	20
RX Aur.	11.62	8.3	1.0	43	−21.0	27	0	+ 9	33
SY Aur.	10.14	9.5	1.0	46	− 2.0	30	−14	+ 6	26
YZ Aur.	18.19	10.8	1.2	43	−20.5	58	+16	+16	43
AN Aur.	10.29	11.8	1.0	46	− 9.5	37	−18	−10	38
AO Aur.	6.76	11.7	1.7	37	−14.5	49	+ 5	+23	19
AS Aur.	.....	11.8	.....	.....	+10.5	.....	.....	.....	.....
RW Cam.	16.41	9.4	0.9	33	−25.5	62	+15	+ 2	46
RX Cam.	7.92	8.7	1.1	36	−35.0	48	.....	+10	.....
RW CMa.	5.73	12.0	1.3	21	+50.0	57	+12	+ 5	27
RY CMa.	4.66	9.0	1.5	26	+37.5	48	+17	+12	31
SS CMa.	12.37	11.4	1.4	43	+60.0	22	+15	+32	25
TV CMa.	4.67	11.9	1.1	20	+39.0	35	− 2	−17	35
TW CMa.	7.00	10.6	1.0	35	+66.5	40	+ 1	− 2	38
176.1932 CMa.	.....	9.5	1.0	.....	+56.5	.....	.....	.....	.....
l Car.	35.52	4.8	1.4	37	+ 4.1	40.3	0	+10	27
RS Cas.	6.30	11.6	1.2	37	−25.0	38	+ 1	+20	17
RW Cas.	14.80	10.1	1.2	36	−63.0	53	+12	+10	37
RY Cas.	12.14	11.0	1.8	43	−70.0	46	+ 7	+ 2	48
SU Cas.	1.95	6.8	0.2	46	− 7.0	22.0	− 3	− 5	48
SW Cas.	5.44	9.9	0.7	27	−38.0	32	− 1	− 4	29
SY Cas.	4.07	9.7	0.8	28	−43.0	52	+10	−11	49
SZ Cas.	13.60	10.8	0.5	36	−42.5	28	.....	.....	.....
TU Cas.	2.14	8.3	0.7	39	−22.2	35.1	+ 2	+ 8	33
UZ Cas.	4.26	11.9	1.3	35	−51.0	52	− 3	+ 4	27
VV Cas.	6.21	11.0	1.0	31	−50.5	33	+24	+15	39
VW Cas.	5.99	11.1	1.2	33	−58.5	52	+20	+ 5	48
XY Cas.	4.50	10.5	0.6	29	−42.0	30	+ 2	−16	46
AP Cas.	6.85	12.5	1.1	31	−44.5	16	+13	.....	49

TABLE 4—*Continued*

Star	Period	Median m_{pg}	Light Range	Light $M-m$	Normal Vel.	Vel. Range	Vel. Lag at Max. Light	Vel. Lag at Min. Light	Vel. ϵ
	days		mag. pg.	% per.	km/ sec	km/ sec	% per.	% per.	% per.
BP Cas.....	1.51	11.6	1.5	.....	−41.0	48	.....	.....	.....
BY Cas.....	3.24	12.0	0.9	46	−44.0	44	− 3	− 6	49
CG Cas.....	4.36	12.6	0.9	25	−87.0	42	+13	+ 9	28
46.1932 Cas.....	9.79	11.0	1.0	.....	−71.0	29	.....	.....	46
AK Cep.....	7.24	12.1	1.0	33	−52.5	53	0	− 9	24
δ Cep.....	5.37	4.2	0.6	29	−15.6	39.5	0	+10	21
X Cyg.....	16.39	7.4	1.4	34	+ 9.3	56.1	+ 4	+ 4	34
SU Cyg.....	3.85	7.3	1.0	29	−35.8	47.0	+ 7	+13	23
SZ Cyg.....	15.11	10.3	1.3	50	−17.0	32	+ 6	+40	15
TX Cyg.....	14.71	11.4	1.9	33	−19.0	46	+ 7	+ 3	37
VX Cyg.....	20.13	10.4	0.8	37	−18.5	61	+18	+ 6	50
VY Cyg.....	7.86	10.7	1.2	27	−10.5	34	0	+ 9	18
VZ Cyg.....	4.86	9.5	0.9	33	−16.5	34	+ 5	+10	28
BZ Cyg.....	10.14	11.6	0.8	37	−17.0	61	0	+10	27
CD Cyg.....	17.07	9.8	1.5	33	−11.0	68	+10	+ 7	36
DT Cyg.....	2.50	5.9	0.4	48	− 0.5	17.0	0	− 3	51
GH Cyg.....	7.82	10.8	1.4	27	−16.5	37	.....	.....	.....
GL Cyg.....	3.37	14.6	1.2	.....	−58.5	.....	.....	.....	.....
MW Cyg.....	5.96	10.5	1.0	29	−13.0	26	+12	+ 3	39
MZ Cyg.....	21.17	12.8	2.0	26	−52.0	59	+27	+ 4	49
V 343 Cyg.....	11.93	14.8	1.3	.....	−93.0	.....	.....	.....	.....
V 386 Cyg.....	5.24	10.5	1.0	.....	−16.5	.....	.....	.....	.....
β Dor.....	9.84	5.0	1.4	49	+ 5.8	37.0	0	+ 6	43
W Gem.....	7.91	7.4	1.1	32	− 0.7	33.4	− 8	+ 5	19
RZ Gem.....	5.53	10.6	1.1	33	+ 6.5	25	+ 6	0	40
AA Gem.....	11.30	10.6	0.9	49	+ 9.5	30	+ 6	+20	35
AD Gem.....	3.79	9.9	0.8	36	+36.0	72	+ 6	+ 3	38
ζ Gem.....	10.15	4.5	0.6	50	+ 6.8	28.5	0	− 5	55
AP Her.....	10.42	11.9	1.4	42	−29.5	40	+27	+36	33
BB Her.....	7.51	10.1	1.0	34	+91.0	24	+ 2	+11	27
BL Her.....	4.20	10.6	0.9	.....	+14.5	27	.....	.....	.....
V Lac.....	4.98	9.3	1.2	23	−20.0	40	+19	+13	29
X Lac.....	5.44	9.1	0.6	38	−26.5	29	+ 9	+12	34
Y Lac.....	4.32	8.6	0.5	33	−18.0	39	+ 2	+ 8	27
Z Lac.....	10.89	9.1	1.4	42	−25.0	44	+ 7	+ 5	43
RR Lac.....	6.42	9.3	1.2	30	−35.0	26	+ 5	+ 3	32
BG Lac.....	5.33	9.2	0.7	31	−19.5	34	+ 4	− 4	40
RX Lib.....	24.95	12.6	1.9	42	−58.0	29	+32	+40	33
CN Lyr.....	2.34	11.3	0.6	34	+22.0	40	.....	.....	.....
T Mon.....	27.01	7.3	1.6	32	+32.0	50.5	0	0	32

TABLE 4—*Continued*

Star	Period	Median m_{pg}	Light Range	Light $M-m$	Normal Vel.	Vel. Range	Vel. Lag at Max. Light	Vel. Lag at Min. Light	Vel. ϵ
	days		mag. pg.	% per.	km/ sec	km/ sec	% per.	% per.	% per.
SV Mon.	15.23	9.4	1.6	32	+26.5	66	+10	+14	29
SZ Mon.	16.38	12.1	1.6	33	+35.0	60	.....	.....	.....
TX Mon.	8.70	11.5	0.9	46	+51.0	40	+ 1	− 5	51
TZ Mon.	7.43	11.6	1.2	35	+34.0	.....	.....	.....	.....
WW Mon.	4.66	13.6	1.6	31	+56.5	57	+ 5	+ 6	30
XX Mon.	.....	11.5	1.0	.....	+64.5	.....	.....	.....	.....
AC Mon.	8.02	10.8	1.3	60	+40.5	62	+ 5	+24	41
S Mus.	9.66	6.9	1.0	45	0.0	48	.....	+14	.....
S Nor.	9.75	7.1	0.8	50	− 6.5	37.0	0	+14	36
Y Oph.	17.12	7.3	0.9	47	− 6.1	19.8	+20	+ 3	64
BF Oph.	4.07	8.2	0.7	32	−31.5	51	− 3	−13	41
BH Oph.	11.05	13.0	2.3	.....	+33.0	50	+16	.....	32
RS Ori.	7.57	9.2	1.2	31	+42.0	45	0	+10	21
CR Ori.	4.91	12.8	0.7	34	+40.5	34	+15	+19	29
CS Ori.	3.89	11.5	0.9	27	+15.5	43	+14	+ 7	34
κ Pav.	9.11	5.1	0.8	48	+36.5	31.0	+ 9	+39	18
SV Per.	11.13	9.3	0.9	40	− 9.5	36	+19	+17	41
SX Per.	4.29	12.2	1.3	25	+ 5.5	56	+ 1	−19	45
UX Per.	4.57	12.6	1.6	33	−41.5	46	+11	+10	24
UY Per.	5.37	12.4	1.5	26	−59.0	26	+ 3	−11	39
VX Per.	10.90	10.0	0.9	53	−33.0	30	0	+21	32
VY Per.	5.53	12.3	1.0	32	−39.5	39	+ 4	+ 1	34
AS Per.	4.97	10.6	1.2	27	−25.5	30	+15	+ 2	41
AW Per.	6.46	8.8	1.2	32	+13.5	40	+ 3	− 5	40
X Pup.	25.96	9.4	1.8	20	+61.5	71	+12	+14	19
RS Pup.	41.34	8.4	2.1	23	+19.0	58	+ 5	+ 5	22
VW Pup.	4.28	12.5	1.4	25	+24.0	41	+14	.....	.....
VX Pup.	3.01	8.6	1.6	45	+12.0	40	.....	.....	.....
VZ Pup.	23.17	11.6	1.8	18	+49.0	34	+19	+ 8	29
WW Pup.	5.52	10.9	1.4	25	+87.0	34	+ 4	− 3	31
WX Pup.	8.94	10.7	1.1	20	+49.0	46	+15	− 7	42
WY Pup.	5.25	11.1	1.1	21	+44.0	41	+ 6	−16	42
WZ Pup.	5.03	12.1	1.3	34	+64.0	34	+ 3	+ 3	34
AD Pup.	13.60	10.5	2.0	38	+67.5	54	+ 8	+11	34
AP Pup.	5.08	8.1	1.1	26	+42.5	.....	.....	.....	.....
AQ Pup.	29.92	10.0	1.9	.....	+41.0	52	+17	− 5	38
AT Pup.	6.66	8.7	1.5	26	+24.5	.....	.....	.....	.....
S Sge.	8.38	6.3	1.0	34	−10.3	41.1	+ 3	+ 8	29
U Sgr.	6.74	7.9	1.2	32	− 2.0	38	+ 9	+20	21
W Sgr.	7.59	5.2	1.8	32	−25.0	41.7	− 2	0	21

TABLE 4—*Continued*

Star	Period	Median m_{pg}	Light Range	Light $M-m$	Normal Vel.	Vel. Range	Vel. Lag at Max. Light	Vel. Lag at Min. Light	Vel. ϵ
	days		mag. pg.	% per.	km/ sec	km/ sec	% per.	% per.	% per.
X Sgr.....	7.01	5.1	1.2	35	−13.5	30.4	+ 1	+10	26
Y Sgr.....	5.77	6.2	1.1	30	− 3.2	36.6	.....	.....	.....
VY Sgr.....	13.56	13.0	2.1	35	− 6.0	60	+17	+22	29
WZ Sgr.....	21.85	9.0	2.2	36	−11.0	62	+11	+16	30
XX Sgr.....	6.42	9.5	1.2	31	+ 2.5	57	+11	+18	24
YZ Sgr.....	9.55	8.0	0.8	36	+18.5	34	0	+17	19
AP Sgr.....	5.06	7.7	1.0	30	−18.0	21	+ 3	0	33
AY Sgr.....	6.57	12.0	1.4	34	−26.5	73	+ 9	+10	33
BB Sgr.....	6.64	7.6	1.0	32	+ 7.5	48	+ 4	− .2	38
V 350 Sgr.....	5.15	8.0	0.9	34	+ 9.5	39	+ 5	+10	29
V 377 Sgr.....	16.17	14.3	1.4	41	− 5.0	.....	.....	.....	.....
V 410 Sgr.....	13.78	13.3	1.5	41	+ 5.0	.....	.....	.....	.....
RV Sco.....	6.06	7.6	1.1	33	−17.5	43	+ 1	+10	25
RY Sco.....	20.31	8.9	1.1	36	−17.5	39	+ 6	+ 4	38
X Sct.....	4.20	10.4	1.2	36	+ 7.0	38	+ 4	+ 8	32
Y Sct.....	10.34	10.4	1.0	44	+ 6.5	36	+18	+ 8	54
Z Sct.....	12.90	10.4	1.6	42	+29.5	40	+10	+19	33
RU Sct.....	19.70	10.6	2.2	28	−14.0	50	+18	+ 1	44
SS Sct.....	3.67	8.4	0.9	38	−14.0	26	+14	+30	22
TY Sct.....	11.05	12.6	1.1	45	+ 6.5	53	+ 4	+ 3	46
UZ Sct.....	14.75	12.4	0.9	14	+12.0	41	+ 9	+25	23
BW Sct.....	3.82	12.7	1.6	.....	+ 1.5	37	.....	.....	.....
BX Sct.....	6.41	13.9	1.3	28	−17.5	50	.....	.....	.....
AA Ser.....	17.13	14.6	1.6	45	− 5.5	.....	.....	.....	.....
ST Tau.....	4.03	8.7	0.9	29	+ 1.0	38	+ 7	−10	46
SW Tau.....	1.58	9.5	0.9	32	+17.0	38	− 3	− 5	23
SZ Tau.....	3.15	7.0	0.6	63	− 3.2	21.9	+10	+25	48
R TrA.....	3.39	7.1	1.0	33	−18.9	32.0	+13	+ 5	41
S TrA.....	6.32	6.9	1.2	34	+ 2.0	38.0	+ 3	+ 6	31
W Vir.....	17.27	10.4	1.3	35	−66.0	67	+ 8	+ 9	35
AL Vir.....	10.30	9.9	1.1	40	+23.0	35	+16	+10	46
T Vul.....	4.44	6.4	0.9	30	− 1.4	35.3	+ 2	+ 4	28
U Vul.....	7.99	8.2	1.0	42	−11.7	37.6	.....	.....	.....
X Vul.....	6.32	9.2	0.7	34	−13.0	47	+ 9	− 4	46
SV Vul.....	45.21	8.8	1.6	24	− 2.5	44	+ 4	+11	16

DISCUSSION

In any statistical use of the data presented it should be kept in mind that the observations are too few to determine unique curves and that, in many cases, their features have been purposely adapted to preconceived notions obtained from well-determined curves previously published and by experience in drawing other curves in this present series. It is rather surprising to find that for 90 stars of the list the simple form of the δ Cephei curve, which is practically made up of two straight lines, represents the observations as well as any other. There are 16 stars, however, for which departures from the simple form seem to be required. RW Cam, RW Cas, and VX Cyg have rounded curves but no irregularities. For RX Aur, AO Aur, TV CMa, RS Cas, SZ Cyg, CD Cyg, RS Pup, and X Sct the curves have been drawn with humps on the ascending branch of the velocity-curve, while for WX Pup and W Vir there is a dip on this branch. The curve of RX Cam shows a striking double minimum which corresponds to the double maximum of the light-curve. A very similar irregularity may be noted on the curve of β Dor as drawn by Miss Applegate.[2] RS Pup, WX Pup, X Sct, and W Vir also show a marked resemblance to the mirror image of their light-curves. The curves of SZ Cas and BL Her are most irregular. Both have small ranges in light and velocity and probably should be classed as peculiar, although their spectra are typical for their respective periods.

FM Aql, AP Her, and RX Lib are peculiar in that the maximum velocity of recession occurs close to the time of maximum light. The photometric elements may need adjustment.

Hertzsprung[3] has studied the forms of light-curves of Cepheids in relation to period and has suggested that certain irregularities are characteristic of certain definite periods. Robinson,[4] who had at hand a much larger collection of photometric material, states that for periods less than about seven days the relation between light-curve and period is slight, but that for periods between 8.5 and 30 days a relationship certainly exists which has but few exceptions. The ve-

[2] *Ibid.*, **13**, 12, 1927.

[3] *B.A.N.*, **3**, 115, 1926.

[4] *Harvard Ann.*, **90**, 82, 1933.

locity-curves, as drawn in Figures 1–18, show little or no tendency to conform to set rules. In most cases the number of observations is not sufficient to show irregularities, but there is apparently a larger percentage of irregular curves among the stars with longer periods. Half the curves showing peculiarities have periods greater than 13 days, while of 36 stars with periods between 7 and 11 days only two have irregular velocity-curves.

The period is the fundamental characteristic of Cepheid variation. Numerous investigators have shown the relation of various physical properties of these stars to the period of the light-variation. The

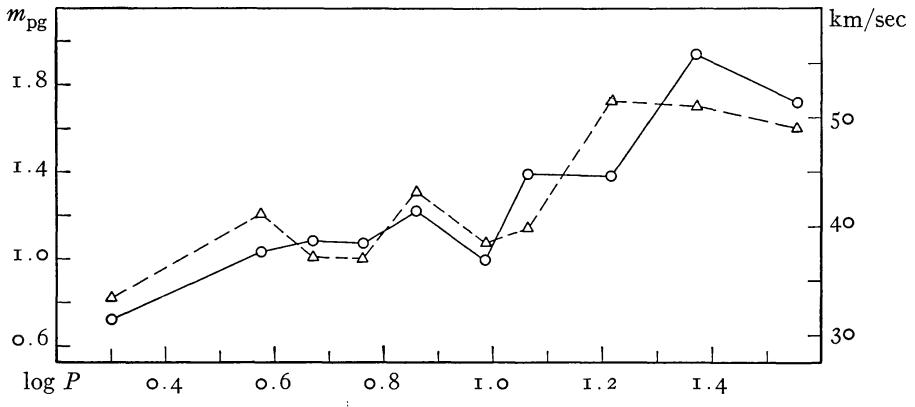

FIG. 19.—Relation of period to magnitude- and velocity-range. Normal points of magnitude-range, circles; velocity-range, triangles.

most striking relationships are those correlating period with luminosity, spectrum, light-range, and velocity-range.

In view of the large increase in the amount of data now available, it will be worth while to reconsider the relation of period to range and eccentricity of light-and velocity-curves, and the lag of velocity extremes.

In Figure 19 the photographic magnitude-range and the velocity-range have been plotted as ordinates and the logarithms of the periods as abscissae. The points represent normal places for ten groups taken according to the logarithm of the period. The numbers of stars in each group from left to right are: 6, 18, 18, 24, 24, 18, 12, 22, 5, 5. With the exception of a drop at about 10 days, there is, in the mean, a fairly steady increase in range, with increasing period,

from 0.7 to 1.9 mags. in light and from 33 to 50 km/sec in velocity. The decrease in range shown by the last group may or may not be real. It is based on only 5 stars and is considerably influenced by the small range of l Carinae both in light and velocity.

In statistical studies of stars of this kind a large dispersion is found when individual stars are considered. The scatter diagram (Fig. 20) showing the correlation between magnitude range-and velocity-range will serve to illustrate the amount of spread which may be expected.

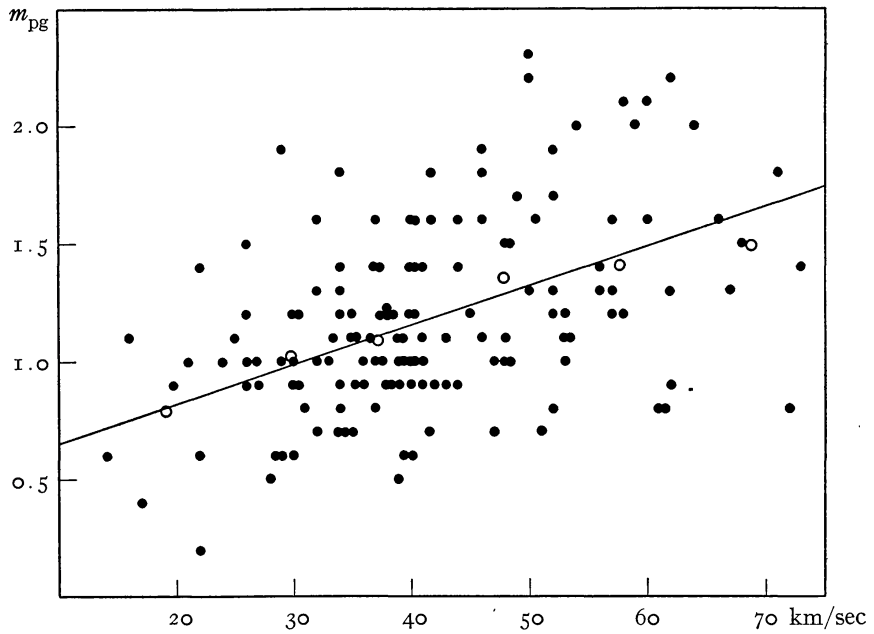

FIG. 20.—Magnitude- and velocity-range. The circles are normal points for groups taken according to velocity-range.

The dots represent individual stars, and the circles are the normal points for groups chosen according to velocity-range.

The same groups which were used in Figure 19 have been employed in Figure 21 to show the relation between period and steepness or eccentricity of the light- and velocity-curves. The mean values of the time elapsing between minimum and maximum light ($M-m$), and between maximum velocity of recession and approach (ϵ), expressed in percentage of the period, are plotted as ordinates. The well-known symmetry of the light-curves of stars of the ζ Geminorum type causes the notable drop in the curve of $M-m$ in the region

of phase 10 days, but this drop is not so prominent in the diagram showing the steepness of the velocity-curves. In general, there is an increase of eccentricity with period in both curves.

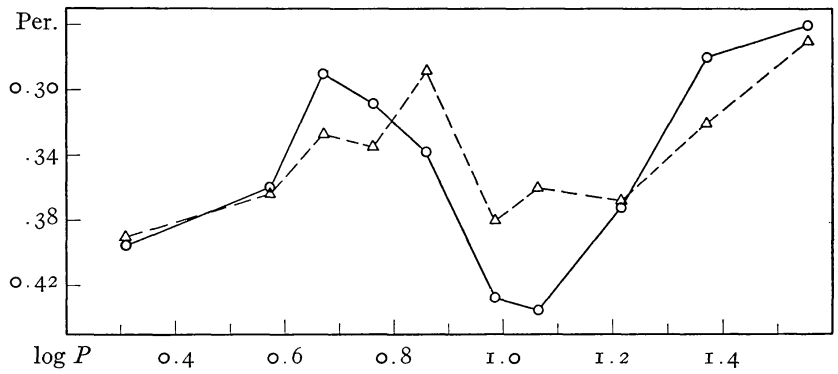

FIG. 21.—Relation of period to asymmetry of light- $(M-m)$ and velocity- (ϵ) curves. Normal points of $M-m$, circles; of ϵ, triangles.

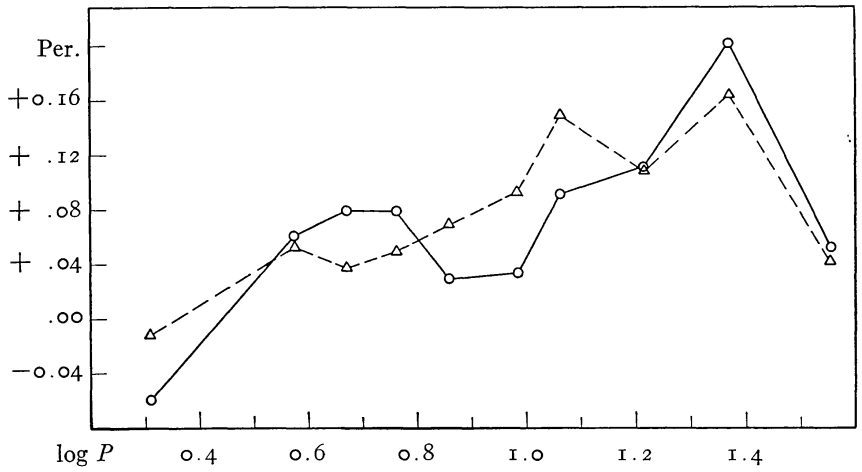

FIG. 22.—Relation of period to lag of velocity extremes at maximum and minimum light. Normal points of lag at maximum light, circles; at minimum light, triangles.

The curves of Figure 22 show the relation of period to the lag of the velocity extremes at maximum and minimum light. The same groups are used as for the preceding figures, and the lags are given in percentages of the period. The differences between the curves are, of course, related to the differences in eccentricity shown in Figure 21. There is apparently an increase of lag with lengthening period

up to periods of about 30 days, beyond which it falls off considerably. The lag varies up to about 20 per cent of the period and averages 6.9 at maximum light and 7.4 per cent at minimum light. These values may be affected by inaccuracy of the photometric elements used in drawing the velocity-curves and also to some extent by the arbitrary manner in which the curves are drawn.

The writer is greatly indebted to Miss Ada Margaret Brayton for much assistance in plotting the light- and velocity-curves and in preparing the material of this paper for publication.

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