Date	θ_o	ρ_o*	O—C $\Delta\theta$	O—C $\Delta\rho$	Nights	Observer
	°	″	°	″		
1899.33	356.8	1.45	+1.0	−0.06	2	TEBBUTT
1900.30	358.0	1.52	+2.5	+0.03	5	TEBBUTT
00.49	357.3	1.49	+1.9	+0.01	3.2	INNES
01.73	355.1	1.40	+0.2	−0.05	2	INNES
02.36	355.7	1.54	+1.1	+0.11	2	INNES
02.39	354.8	1.74	+0.2	+0.31	11	TEBBUTT
03.22	353.6	1.42	−0.6	+0.01	3	INNES
05.35	354.8	1.36	+1.6	+0.01	.....	DOBERCK
05.47	352.9	1.37	−0.2	+0.02	8.6	TEBBUTT
07.67	353.2	1.27	+1.2	−0.01	5.2	TEBBUTT
09.73	352.5	1.22	+1.7	+0.01	5.4	TEBBUTT
11.11	349.7	0.99	−0.2	−0.18	4	INNES
13.45	348.6	1.42	+0.3	[+0.33]	7.8	DAWSON
13.48	348.1	1.13	−0.2	+0.04	2	INNES
15.34	345.0	1.16	−1.8	+0.14	4	VOÛTE
16.46	345.5	1.00	−0.3	+0.02	4	INNES
17.20	345.4	0.97	+0.3	+0.01	3	DAWSON
18.40	344.5	0.95	+0.6	+0.04	3	DAWSON
1919.31	341.8	0.76	−1.0	−0.12	3	DAWSON

*Corrected for systematic error as noted above.

La Plata, November, 1919.

THE PARALLAX OF *CAPELLA* AND ITS DISTANT COMPANION,

BY ZACCHEUS DANIEL and FRANK SCHLESINGER.

Between February 1915 and February 1919, fifteen plates of *Capella* ($5^h\ 9^m$, $+45°\ 54'$) were secured here. As the star is very bright its image on our plates cannot be reduced to equality with those of the comparison stars by means of a rotating sector alone. For the first three plates the grating described by one of us (on page 15, volume 4, Publications of the Allegheny Observatory) was used. The remaining twelve plates were obtained with a small and very thin absorbing screen, close to the photographic film and immediately in front of that portion of the plate upon which the image of *Capella* is formed. This device will be described in full detail later.

The fifteen plates were measured by MR. DANIEL and yield for the relative parallax of *Capella*

$$+''.049 \quad \pm''.007,$$

and for the relative proper-motion

$$+''.078 \quad \pm''.004.$$

The distant companion to *Capella*, discovered by FURUHJELM, (*Astronomische Nachrichten* 4715), appears on the same plates, 7′ 31″ following and 9′ 25″ south. Five comparison stars were selected, three of which had likewise been used for *Capella* itself. Their measurement yields for the relative parallax of the companion,

$$+''.079 \quad \pm''.008$$

and for the relative proper-motion,

$$+''.068 \quad \pm''.005.$$

The average distance of the five comparison stars from the companion is 13′. There is always danger of error in measuring the position of a star not at or near the center of the plates, unless the comparison stars are close. For this reason a second solution was made for the companion, using in effect a single comparison star distant only 35″. This gave for the parallax

$$+''.067 \quad \pm''.009,$$

and for the proper-motion

$$+''.077 \quad \pm''.005,$$

and these are probably more reliable than those that result from the use of the five comparison stars.

Assuming that the parallaxes of *Capella* and the companion are the same, the best mean that these plates yield may be taken as

+".063 ±".006.

Allowing ".005 for the parallaxes of the comparison stars, the corresponding absolute parallax is +".068. Among earlier determinations are ELKIN's (+".079 ±".021), ADAMS and JOY's (+".105), and JOST's (+".051 ±".023). The mean of all gives for the absolute parallax +".077.

Capella is a spectroscopic binary with a period of 104 days. The two components do not differ very greatly in brightness. Their separation is about 83,000,000 km times the cosecant of the (unknown) angle of inclination of the orbit; it is therefore at least 0.56 of that between the *Earth* and the *Sun*. At certain times the components of this spectroscopic binary must appear to be at least 0".04 apart. Attempts have been made by HUSSEY, AITKEN, and others to observe an elongation in the image of *Capella*, but without success.

Allegheny Observatory of the University of Pittsburgh,
January 14, 1920.

OBSERVATIONS OF VARIABLE STARS,

BY WILLIAM DOBERCK.

(Continued from *A. J.* 760.)

SZ Cygni: The M. C. comparison stars were used: *c* 8.06, *d* 8.17, *d'* (*A. S. V.* 27) 8.63, *e* 8.72, *f* 8.74, *g* 9.21, *h* 9.54, *k* 0358 9.32 (7), 0633 9.48 (4), 0771 9.73 (6), 0797 9.70 (5), 1852 9.77 (6), 1920 9.82 (5), 2102 9.62 (3), 2121 9.66 (6), 2181 9.49 (5), 2241 9.71 (5), 2299 9.53 (5), *l* 10.40. *c* and *l* were determined at H. C., the others compared here. The value of a step is 0.10. The first maximum (8.64) occurred at 2421835.8, the second (8.67) at 1836.9, and the third (9.59) at 1845.1. The first minimum (8.83) occurred at 2421836.4, the second (9.61) at 1844.4, and the third (9.63) at 1846.3. The period, obtained by comparison with the value adopted by HARTWIG in 1913, and taking the mean of the first two maxima and the first minimum given above (1836.37) to represent the epoch of the present maximum, is 15.1105 days. Minimum occurs 8.9 days after maximum. *SZ Cygni* is a flash star and, like in the case of *VY Cygni*, the flash is double. The 24 equidistant coördinates of the lightcurve, beginning with 1836.37 are as follows: 8.82, 8.70, 8.94, 9.01, 9.05, 9.11, 9.20, 9.29, 9.35, 9.37, 9.46, 9.54, 9.60, 9.62, 9.59, 9.61, 9.63, 9.53, 9.41, 9.40, 9.36, 9.21, 8.78, 8.65. The curve is wavy and as the waves appear in the mean of a number of years' observations, it is evident that they are more or less repeated in every period. The formula is:

$$\text{Mag.} = 9.26 - 0.405 \cos (x - 18\tfrac{1}{2}^\circ) - 0.10 \cos (2x + 11\tfrac{1}{2}^\circ) - 0.06 \cos (3x + 18\tfrac{1}{2}^\circ)$$

It is preferable to use cos, as the dis-symmetry of the curve is then seen at a glance. The coefficients $a_4 \ldots a_{12}$ of the cos are: −0.03, −0.01, +0.04, +0.03, +0.02, +0.03, +0.02, +0.02, 0.00. The coefficients $b_4 \ldots b_{11}$ of the sin are: +0.04, +0.05, 0.00, −0.01, −0.01, −0.02, −0.01, −0.01. When a series converges so slowly it is not very important.

0347.41	*k* 1 *v* 1 *h*	9.43	0401.43	*f* 1½ *v*	8.89	0696.44	*h* 1½ *v*	.69	0779.26	*d'* 3 *v* 3 *g*	.92
0349.37	*v* = *h*	.54	0401.45	*f* 1 *v* 3 *g*	.86	0709.43	*g* 1 *v* 2 *h*	.32	0779.29	*f* 2 *v* 3 *g*	.93
0356.36	*v* = *g*	.21	0401.46	*f* 1 *v*	.84	0749.33	*e* 2 *v* 1 *f*	8.74	0779.36	*f* 1½ *v* 4 *g*	.86
0357.35	*e* 2 *v* 2 *g*	8.97	0516.22	*h* 1 *v*	9.64	0750.38	*f* 2½ *v* 1 *g*	9.08	0785.39	*v* = *k*	9.77
0358.34	*e* 2½ *v* 2 *k*	9.05	0538.25	*g* 2 *v* 4 *h*	.32	0751.39	*f* 3 *v* 2 *g*	.02	0788.36	*h* 2 *v* = *k*	.72
0361.34	*v* = *k*	.32	0646.39	*f* 3 *v* 1 *g*	.09	0752.31	*g* 3 *v* 3 *h*	.37	0789.39	*h* 1 *v*	.64
0362.34	*k* 2 *v* 1 *h*	.47	0654.45	*g* 3 *v* 3 *h*	.37	0753.34	*g* 1½ *v* 1 *k*	.50	0791.28	*v* 2½ *h*	.29
0364.36	*v* = *h*	.54	0655.44	*g* 2 *v* 2 *k*	.34	0758.48	*k* 1 *v* 4 *l*	.85	0800.35	*v* = *h*	.54
0366.35	*g* 2 *v* 2 *h*	.37	0656.45	*d* 3 *v* 3 *e*	8.44	0760.32	*g* 1 *v* 1 *h*	9.38	0801.28	*h* 2 *v* 1 *k*	.65
0368.33	*k* 1½ *v* 1 *h*	.45	0663.40	*g* 2 *v* 1 *h*	9.43	0761.31	*g* 3 *v* 3 *h*	.38	0804.36	*h* 3 *v* 1 *k*	.67
0386.41	*c* 4 *v* 2 *e*	8.50	0665.40	*g* 1 *v* 2 *h*	.32	0770.35	*h* 2 *v* 3 *k*	.62	0807.30	*v* = *f*	8.74
0401.41	*v* 3 $\frac{g+h}{2}$	9.07	0667.42	*h* 1 *v*	.64	0775.41	*v* = *h*	.54	0887.22	*g* 1 *v* 4 *h*	9.28
0401.41	*f* 3 *v*	.04	0670.40	*g* 2 *v* 1 *h*	.43	0777.36	*f* 2 *v* 3 *g*	8.93	0903.24	*v* 1 *g*	.11