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Drukarnia „ZNICZ“ Ś-to Jańska 1.

WŁ. DZIEWULSKI.

Secular perturbations of the minor planet (887), Alinda, arising from the action of Mars.

As the orbit of the minor planet (887) has a great eccentricity, it approaches at the perihelium nearer to the Sun than the planet Mars. In this respect the minor planet remembers the wellknown minor planet Eros. It seemed to be of some interest to calculate the secular perturbations of (887), arising from the actions of the eight major planets of the solar system. I have calculated the most interesting perturbations arising from the action of Mars, adopting the method of computation devised by Mr. *R. T. A. Innes* [1]).

After getting the components of the disturbing force I applied the method of mechanical quadrature The values of the functions were calculated by means of six figure logarithms.

The final test of the values of the perturbations in the plane of the orbit has been deduced from the formula:

$$\sin \varphi . \ {}^{1}/_{2} \ A_1^{(s)} + \cos \varphi . \ B_0^{(c)} = 0$$

The elements of the orbit of (887) Alinda adopted in this investigation are those given by *Stracke* [2]). Afterwards Mr. *Stracke* has corrected these elements, which I regret not to be able to take into account in this paper.

Orbit elements of (887) Alinda.

$$\left.\begin{aligned} \pi &= 97^{0}\ 44'\ 13''.8 \\ i &= 8\ \ 57\ \ 52.5 \\ \Omega &= 109\ \ 59\ \ 21.3 \end{aligned}\right\} 1850$$

$$\begin{aligned} \varphi &= 32\ \ 13\ \ 45.8 \\ \mu &= 880''.158 \\ \log a &= 0.403632 \end{aligned}$$

Dividing the orbit into 128 equal parts, with respect to the eccentric anomaly, the following values of the true anomalies and logarithms of the radii vectores were deduced:

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[1]) Monthly Notices of the R. Astr. Soc Vol. 67, p. 427. 1907.

[2]) Astronomische Nachrichten. Bd. 208. p. 46. 1919.

TABLE I.

E	v	log r_0	E	v	log r_0
°	° ′ ″		°	° ′ ″	
0.0000	0 0 0.0	9.889763	90.0000	122 13 45.8	0.220735
2.8125	5 5 44.1	9.890361	92.8125	124 34 40.6	0.231954
5.6250	10 10 37.9	9.892146	95.6250	126 52 2.6	0.242864
8.4375	15 13 52.1	9.895102	98.4375	129 6 3.2	0.253456
11.2500	20 14 39.1	9.899196	101.2500	131 16 52.8	0.263721
14.0625	25 12 14.1	9.904387	104.0625	133 24 42.1	0.273654
16.8750	30 5 55.6	9.910624	106.8750	135 29 40.9	0.283246
19.6875	34 55 6.0	9.917846	109.6875	137 31 58.7	0.292494
22.5000	39 39 12.0	9.925987	112.5000	139 31 44.8	0.301393
25.3125	44 17 44.8	9.934975	115.3125	141 29 8.0	0.309940
28.1250	48 50 20.8	9.944734	118.1250	143 24 16.8	0.318131
30.9375	53 16 40.3	9.955186	120.9375	145 17 19.2	0.325965
33.7500	57 36 28.6	9.966254	123.7500	147 8 23.3	0.333438
36.5625	61 49 35.1	9.977858	126.5625	148 57 36.2	0.340549
39.3750	65 55 53.2	9.989924	129.3750	150 45 5.5	0.347298
42.1875	69 55 19.7	0.002378	132.1875	152 30 58.0	0.353682
45.0000	73 47 54.9	0.015148	135.0000	154 15 20.3	0.359703
47.8125	77 33 41.6	0.028169	137.8125	155 58 19.1	0.365358
50.6250	81 12 45.3	0.041377	140.6250	157 40 0.5	0.370648
53.4375	84 45 13.2	0.054715	143.4375	159 20 30.5	0.375572
56.2500	88 11 14.2	0.068128	146.2500	160 59 55.1	0.380131
59.0625	91 30 59.1	0.081566	149.0625	162 38 19.8	0.384324
61.8750	94 44 38.9	0.094984	151.8750	164 15 50.3	0.388152
64.6875	97 52 25.8	0.108341	154.6875	165 52 31.9	0.391614
67.5000	100 54 32.6	0.121599	157.5000	167 28 29.8	0.394712
70.3125	103 51 12.5	0.134725	160.3125	169 3 49.2	0.397444
73.1250	106 42 38.7	0.147688	163.1250	170 38 35.2	0.399812
75.9375	109 29 4.5	0.160462	165.9375	172 12 52.6	0.401814
78.7500	112 10 43.2	0.173022	168.7500	173 46 46.3	0.403453
81.5625	114 47 47.9	0.185347	171.5625	175 20 21.2	0.404727
84.3750	117 20 31.6	0.197418	174.3750	176 53 41.9	0.405637
87.1875	119 49 6.8	0.209219	177.1875	178 26 53.3	0.406183

TABLE I.

E	v			$\log r_0$	E	v			$\log r_0$
°	°	′	″		°	°	′	″	
180.0000	180	0	0.0	0 406365	270.0000	237	46	14.2	0.220735
182.8125	181	33	6.7	0.406183	272.8125	240	10	53.2	0.209219
185.6250	183	6	18.1	0.405637	275.6250	242	39	28.4	0.197418
188.4375	184	39	38.8	0.404727	278.4375	245	12	12.1	0.185347
191.2500	186	13	13.7	0.403453	281.2500	247	49	16.8	0.173022
194.0625	187	47	7.4	0.401814	284.0625	250	30	55.5	0.160462
196.8750	189	21	24.8	0.399812	286.8750	253	17	21.3	0.147688
199.6875	190	56	10.8	0.397444	289.6875	256	8	47.5	0.134725
202.5000	192	31	30.2	0.394712	292 5000	259	5	27.4	0.121599
205.3125	194	7	28.1	0.391614	295.3125	262	7	34.2	0.108341
208.1250	195	44	9.7	0.388152	298.1250	265	15	21.1	0.094984
210.9375	197	21	40.2	0.384324	300.9375	268	29	0.9	0.081566
213.7500	199	0	4.9	0.380131	303.7500	271	48	45 8	0.068128
216.5625	200	39	29.5	0.375572	306.5625	275	14	46.8	0.054715
219.3750	202	19	59.5	0.370648	309.3750	278	47	14.7	0.041377
222.1875	204	1	40.9	0.365358	312.1875	282	26	18.4	0.028169
225.0000	205	44	39.7	0 359703	315.0000	286	12	5.1	0.015148
227.8125	207	29	2.0	0.353682	317.8125	290	4	40.3	0.002378
230.6250	209	14	54.5	0.347298	320.6250	294	4	6.8	9.989924
233.4375	211	2	21.8	0.340549	323.4375	298	10	24.9	9.977858
236.2500	212	51	36.7	0.333438	326.2500	302	23	31.4	9.966254
239.0625	214	42	40.8	0.325965	329.0625	306	43	19.7	9.955186
241.8750	216	35	43.2	0.318131	331.8750	311	9	39.2	9.944734
244.6875	218	30	52.0	0.309940	334 6875	315	42	15.2	9.934975
247.5000	220	28	15.2	0.301393	337.5000	320	20	48.0	9.925987
250.3125	222	28	1.3	0.292494	340.3125	325	4	54.0	9.917846
253.1250	224	30	19.1	0.283246	343.1250	329	54	4.4	9.910624
255.9375	226	35	17.9	0.273654	345.9375	334	47	45.9	9.904387
258.7500	228	43	7.2	0.263721	348.7500	339	45	20 9	9.899196
261.5625	230	53	56 8	0.253456	351.5625	344	46	7.9	9.895102
264 3750	233	7	57.4	0.242864	354.3750	349	49	22.1	9.892146
267.1875	235	25	19.4	0.231954	357.1875	354	54	15.9	9.890361

Using the orbit elements of the planet Mars, referred to the epoch 1850 and taken from *Hill*'s[1]) memoir, the following constants have been calculated:

$$\Pi = 156^\circ\ 19'\ 25''.8 \qquad K = 124^\circ\ 34'\ 44''.6$$
$$\Pi' = 32^\circ\ 0'\ 42''.4 \qquad K' = 124^\circ\ 2'\ 37''.9$$
$$I = 8^\circ\ 14'\ 42''.2 \qquad \log k = 9.998741$$
$$\log \alpha = 0.220735 \qquad \log k' = 9.996765$$
$$1 : m' = 3093500$$

Table II contains the values of the components of the disturbing force: R_0, S_0, W_0. The equality of the summations of the functions for the odd and even divisions forms a useful test of the performed calculation against large numerical errors. This test may be seen from the following table, giving the functions for the secular perturbations, namely:

$$\Sigma\,[R_0 \sin v + (\cos v + \cos E)\, S_0] = +\ 5.44755 \text{ and } +\ 5.44759$$

$$\Sigma\left[-R_0 \cos v + \left(\frac{r}{a\cos^2\varphi} + 1\right)\sin v\, S_0\right] = -\ 46\,80270 \ \text{„}\ -\ 46.80274$$

$$\Sigma\,[W_0 \cos u] = -\ 1.16796 \ \text{„}\ -\ 1.16817$$

$$\Sigma\,[W_0 \sin u] = -\ 23.04131 \ \text{„}\ -\ 23.04264$$

$$\Sigma\left[-2\,\frac{r}{a}\,R_0\right] = +105.0497 \ \text{„}\ +\ 105.0484$$

The following results of the secular perturbations were determined:

$$\left[\frac{de}{dt}\right]_{00} = +\ 0''.007483$$

$$\left[\frac{d\lambda}{dt}\right]_{00} = -\ 0''.120545$$

$$\left[\frac{di}{dt}\right]_{00} = -\ 0''.002242$$

$$\left[\frac{d\Omega}{dt}\right]_{00} = -\ 0''.283847$$

$$\left[\frac{d\pi}{dt}\right]_{00} = -\ 0''.124012$$

$$\left[\frac{dL}{dt}\right]_{00} = +\ 0''.148536$$

[1]) Astronomical Papers of the American Eph. and Naut Alm. Vol. IV.

TABLE II.

E	R_0	S_0	W_0
0°.0000	+1.09307	−0.003752	+0.172767
2.8125	1.09972	−0.010299	0 135841
5.6250	1.11542	−0.017249	0.100859
8.4375	1.14098	−0.024698	0.066103
11.2500	1.17712	−0.032800	0.029769
14.0625	1 22474	−0.041698	−0.010172
16.8750	1.28525	−0.051640	−0.056227
19.6875	1.35996	−0.062946	−0.111706
22.5000	1.45017	−0.076083	−0 181212
25.3125	1 55638	−0.091718	−0.271339
28 1250	1.67777	−0.110898	−0.391898
30.9375	1.80872	−0.135160	−0.557495
33.7500	1.93198	−0.166762	−0.789368
36.5625	2.00722	−0.208790	−1.116356
39.3750	1.94670	−0.264724	−1.567837
42.1875	1.59334	−0.334846	−2 142340
45.0000	0.76545	−0.408368	−2.731444
47.8125	−0.50992	−0.458305	−3.081403
50.6250	−1.80604	−0.460285	−2.988103
53 4375	−2.66057	−0.421363	−2 551608
56.2500	−3.00610	−0.367541	−2.027352
59.0625	−3.02437	−0.316643	−1.570515
61.8750	−2.88721	−0.274117	−1.216981
64.6875	−2.69504	−0.239934	−0.954552
67.5000	−2.49459	−0.212462	−0.760705
70.3125	−2.30532	−0.190139	−0 616229
73.1250	−2.13383	−0.171651	−0.506942
75.9375	−1.98103	−0.156100	−0.422881
78.7500	−1.84607	−0.142843	−0.357241
81.5625	−1.72675	−0.131373	−0.305128
84.3750	−1.62135	−0.121356	−0.263229
87.1875	−1.52786	−0.112528	−0.229084

TABLE II.

E	R_0	S_0	W_0
90°.0000	—1.44477	—0.104694	—0.200962
92.8125	—1.37062	—0.097699	—0.177554
95.6250	—1.30423	—0.091418	—0.157883
98.4375	—1.24457	—0.085758	—0.141219
101.2500	—1.19076	—0.080635	—0.126982
104.0625	—1.14217	—0.075986	—0.114743
106.8750	—1.09808	—0.071749	—0.104147
109.6875	—1.05806	—0.067888	—0.094922
112.5000	—1.02161	—0.064354	—0.086849
115.3125	—0.98835	—0.061114	—0.079742
118.1250	—0.95797	—0.058140	—0.073460
120.9375	—0.93018	—0.055405	—0.067880
123.7500	—0.90475	—0.052886	—0.062903
126.5625	—0.88141	—0.050562	—0.058447
129.3750	—0.86003	—0.048416	—0.054442
132.1875	—0.84044	—0.046433	—0.050830
135.0000	—0.82248	—0.044596	—0.047560
137.8125	—0.80603	—0.042894	—0.044590
140.6250	—0.79097	—0.041316	—0.041884
143.4375	—0.77723	—0.039853	—0.039410
146.2500	—0.76469	—0.038494	—0.037142
149.0625	—0.75330	—0.037226	—0.035055
151.8750	—0.74298	—0.036049	—0.033130
154.6875	—0.73366	—0.034953	—0.031345
157.5000	—0.72532	—0.033932	—0.029688
160.3125	—0.71787	—0.032980	—0.028143
163.1250	—0.71131	—0.032091	—0.026697
165.9375	—0.70559	—0.031261	—0.025339
168.7500	—0.70068	—0.030486	—0.024058
171.5625	—0.69655	—0.029760	—0.022846
174.3750	—0.69318	—0.029082	—0.021693
177.1875	—0.69056	—0.028444	—0.020588

TABLE II.

E	R_0	S_0	W_0
0			
180.0000	—0.68866	—0.027847	—0.019530
182 8125	—0.68748	—0.027288	—0.018505
185.6250	—0.68701	—0.026756	—0 017512
188.4375	—0.68725	—0 026256	—0.016541
191.2500	—0.68819	—0.025783	—0 015585
194.0625	—0.68985	—0.025332	—0.014638
196.8750	—0.69221	—0 024903	—0.013695
199.6875	— 0.69530	—0.024492	—0 012747
202.5000	—0.69912	—0 024095	—0.011790
205 3125	—0.70369	—0.023709	—0.010814
208.1250	—0.70902	—0.023331	—0.009811
210.9375	—0.71514	—0.022960	—0.008775
213.7500	—0 72209	—0.022589	—0.007696
216.5625	—0.72987	—0.022215	—0.006563
219 3750	—0.73854	—0.021835	— 0.005366
222.1875	—0.74814	—0.021442	—0.004093
225.0000	—0.75871	—0.021034	—0.002730
227.8125	—0 77031	— 0.020604	—0.001262
230.6250	—0.78300	—0.020145	+0.000330
233.4375	—0.79684	—0.019651	0 002065
236.2500	—0 81193	—0.019113	0 003966
239 0625	—0.82833	—0.018522	0.006062
241.8750	—0.84617	—0.017869	0.008382
244.6875	—0 86554	—0 017142	0 010965
247.5000	—0.88659	—0.016328	0 013853
250 3125	—0.90948	—0.015411	0.017100
253.1250	—0.93434	—0.014376	0.020767
255.9375	—0.96143	—0.013197	0.024928
258.7500	— 0.99092	—0.011857	0.029674
261.5625	—1.02312	—0.010327	0.035116
264.3750	—1.05829	—0.008575	0.041387
267.1875	—1.09688	—0 006564	0.048658

TABLE II.

E	R_0	S_0	W_0
0			
270 0000	—1.13913	– 0.004255	+0.057131
272.8125	—1.18567	—0.001593	0.067077
275.6250	—1.23702	+0.001481	0.078827
278.4375	—1.29389	0.005038	0.092816
281.2500	—1.35692	0.009161	0.109592
284 0625	—1.42710	0.013956	0.129897
286.8750	—1.50547	0.019537	0.154713
289.6875	– 1.59306	0.026062	0.185330
292 5000	—1.69107	0.033699	0 223534
295 3125	—1 80058	0.042659	0.271776
298.1250	—1.92227	0.053194	0.333337
300.9375	—2.05596	0.065575	0.412980
303.7500	—2.19836	0.080079	0.516846
306.5625	—2.34180	0.096872	0.653195
309.3750	—2.46819	0.115884	0.831581
312.1875	—2.54114	0.136246	1.059805
315 C000	—2.49842	0.155771	1.335956
317.8125	—2.25311	0.170011	1.630113
320.6250	—1.74084	0.173083	1.870861
323.4375	—1.00450	0.161502	1.964873
326.2500	—0.22357	0.138264	1.869376
329.0625	+0 41073	0.111338	1.636732
331.8750	0 82500	0.087263	1.357335
334.6875	1.05181	0.068315	1.096543
337.5000	1.15456	0 054043	0.878748
340.3125	1.18697	0.043151	0 705989
343.1250	1.18370	0.034495	0.571109
345.9375	1.16496	0.027204	0.465675
348.7500	1.14190	0.020673	0.382314
351.5625	1.12074	0.014553	0.315291
354.3750	1.10442	0.008543	0.260120
357.1875	1.09485	0 002484	0.213484
Σ_1	—43 35254	—3.086390	—3.818600
Σ_2	—43.35179	—3.086495	—3.818985

Wilno, 1924. III. 16

WŁ. DZIEWULSKI

Observations et éléments de l'étoile variable X Cygni.

Les observations de cette étoile ont été faites à Cracovie par la méthode d'*Argelander* à l'aide d'une lunette de 135 mm d'ouverture. Du 27 octobre 1911 au 23 octobre 1916 j'ai fait 148 comparaisons de son éclat. Pendant les années 1912 et 1913 j'ai fait des comparaisons entre son éclat et celui des étoiles suivantes:

	P. D.
BD + 29° 4121	5.^{m}73
+ 29 4131	6. 26
+ 35 4282	6. 72
+ 34 4127	6. 96
+ 34 4111	7. 06
+ 34 4114	7. 44

M. *Kritzinger*[1]) avait remarqué que l'étoile BD + 34°4127 est variable; moi-même je me suis aperçu que l'étoile BD + 35°4282 en est une; aussi ai-je changé les étoiles de comparaison pour me servir des suivantes:

	P. D.	deg.
BD + 34° 4159	6.^{m}66	22.6
+ 34 4081	6. 94	15.7
+ 32 3883	7. 08	9.3
+ 32 3865	7. 08	8.0
+ 34 4114	7. 44	0.0

Pour rendre les observations homogènes j'ai fait une réduction de la première série des observations à la seconde.

A l'aide des éléments de M. *M. Luizet*[2]) on obtient:

Max. = 2410190.678 (t. m. Greenwich) + 16.38543 E.

Les observations, ordonnées suivant les valeurs croissantes de la phase, étaient divisées en 16 groupes. En examinant le moment de maximum, j'ai trouvé qu'il fallait corriger de — 0.^{j}20 le moment obtenu au moyen des éléments de M. *M. Luizet*. Les éléments de M. *M. Luizet*, étant cependant calculés à la suite des nombreuses observations de lui même et d'autres observateurs, j'ai renoncé à calculer de nouveau ces éléments.

Les 16 groupes dont les moyennes sont contenues dans le tableau suivant ont servi à tracer la figure ci-jointe.

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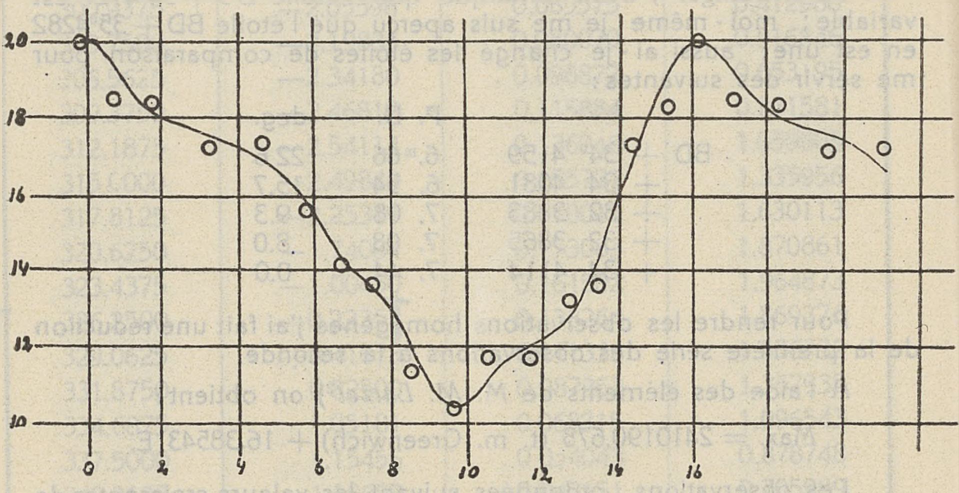
[1]) Astr. Nachrichten. Vol. 197, p. 99.

[2]) Astr. Nachrichten. Vol. 195, p. 83.

TABLEAU

j.	deg.	j	deg.
— 0.204	20 0	8.501	11.4
+ 0 636	18.5	9 577	10 4
1.836	18.3	10.582	11.8
3.251	17.2	11.722	11.8
4.627	17 3	12.719	13.2
5.795	15.6	13.537	13.7
6 676	14 2	14 406	17 3
7.548	13.7	15.304	18.3

Les éclats extrêmes sont $6.^{m}75$ et $7.^{m}06$. La durée d'augmentation est de $6.^{d}6$. L'erreur moyenne d'une observation en résulte $2.^{d}3$, c'est à dire $0.^{m}07$.



Wilno, 1924. IV. 27.

WL. DZIEWULSKI.

Observations et éléments de l'étoile BD + 35° 4282.

Cette étoile a été une des étoiles de comparaison pendant la première série des observations de l'étoile variable X Cygni. Ayant bientôt remarqué que cette étoile BD + 35° 4282 est aussi variable, j'ai commencé à l'observer régulièrement. Les observations de cette étoile ont été faites à Cracovie par la méthode d'*Argelander* à l'aide d'une lunette de 135 mm d'ouverture. A partir du 25 juin 1912 jusqu'au 23 octobre 1916 j'ai fait 126 comparaisons de son éclat; les étoiles de comparaison étaient les mêmes que pour les observations de l'étoile variable X Cygni.

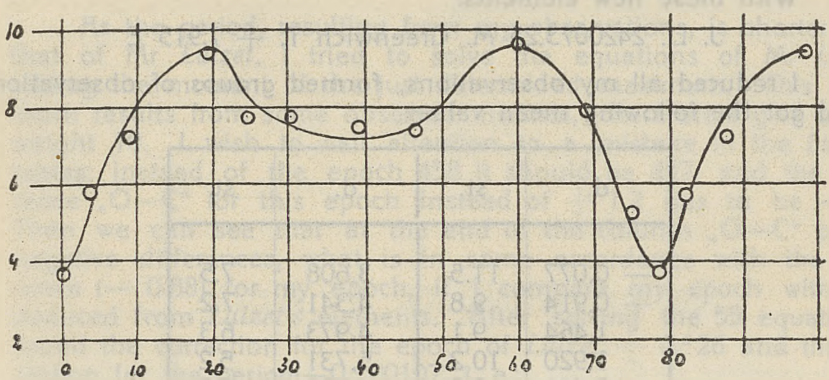
J'ai cherché les époques de quelques minima et j'ai trouvé une période de 78.5 jours. Les éléments qui résultent de la discussion de ces minima sont:

$$\text{Min.} = 2420276.0 \text{ (t. m. Greenwich)} + 78.5 \text{ E}$$

Les 126 observations, ordonnées suivant la phase comptée à partir du minimum, ont été divisées en 12 groupes; les moyennes de ces groupes sont les suivantes:

j.	deg.	j.	deg.
0.1	3.7	39.3	7.5
3.6	5.8	46.6	7.4
9.1	7.2	52.9	8.8
19.4	9.4	60.3	9.7
24.6	7.8	69.2	7.9
30.9	7.8	74.9	5.3

La courbe de lumière ci-jointe, tracée à l'aide des données précédentes, montre que l'étoile BD + 35°4282 est une étoile du type β Lyrae. Les éclats extrêmes sont $7.^m05$ et $7.^m27$ et pour le mimimum sécondaire — $7.^m13$.



Wilno, 1924. IV. 27.

WŁ. DZIEWULSKI.

On the variable star W Geminorum.

I observed in Cracow the variable star W Geminorum since December 6th 1912 until April 3d 1915, following the method of *Argelander.* I made on the whole 82 observations with a four inches short focus refractor. For reference I used the following stars (the magnitudes are taken from the Potsdam Catalogue = P. D.):

	Star	D. P.	Steps
B. D.	$+16^{\circ}$ 1178	$6.^{m}59$	17.6
	16 1201	6. 85	13.4
	15 1230	7. 35	7.8
	15 1233	7. 36	4.7
	14 1344	7. 71	0.0

As starting point I took the elements of *Luizet* [1]), namely:

J. D. 2413266.34 M. Greenwich T. + 7.91603 E.

The observations, expressed in units of my scale were grouped according to the period of *Luizet.* I got a curve of brightness and studied especially the curve near the minimum and the maximum of brightness. As the curve of brightness appears more distinctly near the maximum, I studied this moment. From the epoch of *Luizet* to the mean epoch of my observations elapsed 860 periods, and the maximum results at $7.^{d}04$, i. e. $0.^{d}876$ earlier as according to the period of *Luizet.* After making this correction to the mean epoch and after comparing this epoch with the epoch of *Luizet*, I got the period — 7.915 days.

With these new elements:

J. D. 2420073.25 M. Greenwich T. + 7.915 E

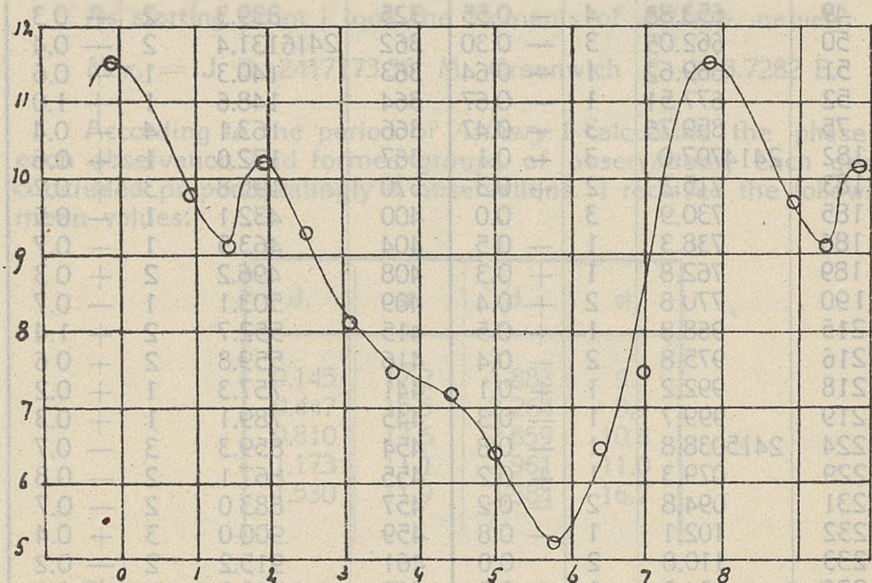
I reduced all my observations, formed groups of observations and got the following mean values:

d.	st.	d.	st.
— 0.077	11.5	3.608	7.5
+ 0.914	9.8	4.341	7.2
1.464	9.1	4.973	6.3
1.920	10.2	5.731	5.2
2.461	9.3	6.325	6.5
3.035	8.1	6.992	7.5

[1]) Astronom. Nachr. Vol. 169, p. 401.

The mean error of each observation amounts to $\pm$ 1.2, i. e. $\pm$ 0.^{m}08 in the Potsdam scale.

The curve represents the alterations of brightness of the star. In my scale the brightness of W Geminorum oscillates between 5.2 and 11.5 steps, which corresponds to 7.^{m}39 and 6.^{m}99 of the Potsdam scale; this amplitude is much smaller than the amplitude of Mr *Luizet*.



W Geminorum.

As the period, resulting from my observations, is shorter than that of Mr *Luizet*, I tried to solve the equations of Mr *Luizet*, adding the moment of the just determined maximum. This maximum results from some observed maxima, therefore I give to it a weight 10. I wish to call attention to a mistake in the *Luizet's* tables: instead of the epoch 458 it should be 457, and the difference „O—C" for this epoch instead of $+$ 1.2 has to be — 1.0. Then we can see that at the end of the column „O—C" prevail negative differences, what is in some accordance with the difference (— 0.88) for my epoch, if I compare my epoch with that deduced from *Luizet's* elements. After solving the 55 equations I found the correction for the epoch of *Luizet* $+$ 0.^{d} 26 and the correction for the period:—0.^{d} 00107, i. e.:

Max. = J. D. 2413266.60 M. Greenwich T. $+$ 7. 91496 E.

The following table gives the differences (O—C) of the observed and calculated (with the last given elements) epochs:

E	M. Greenw. T. observed	p	0 — C	E	M. Greenw. T. observed	p	0 — C
0	2413267.05	1	+ 0.45	312	2415737.6	3	+ 1.5
1	275.42	1	+ 0.91	315	760.0	4	+ 0.2
46	631.55	2	+ 0.86	317	775.6	3	0.0
47	638.04	3	— 0.56	319	792.7	4	+ 1.2
48	646.44	2	— 0.08	322	814.5	3	— 0.7
49	653.88	4	— 0.55	325	839.3	2	+ 0 3
50	662.05	3	— 0.30	362	2416131.4	2	— 0.4
51	669.62	1	— 0.64	363	140.3	1	+ 0.6
52	677.51	1	— 0.67	364	148.6	1	+ 1.0
75	859.75	3	— 0.47	366	163.1	4	— 0.4
182	2414707.0	3	— 0.1	367	172.0	1	+ 0.6
183	715.3	2	+ 0.3	370	195.8	3	+ 0.7
185	730.9	3	0.0	400	432.1	1	— 0.5
186	738.3	1	— 0 5	404	463.5	1	— 0.7
189	762.8	1	+ 0.3	408	496.2	2	+ 0 3
190	770 8	2	+ 0.4	409	503.1	1	— 0.7
215	968.8	1	+ 0.5	415	552.7	2	+ 1.4
216	975.8	2	— 0.4	416	559.8	2	+ 0 6
218	992.2	1	+ 0.1	441	757.3	1	+ 0.2
219	999.7	1	— 0.3	445	789.1	1	+ 0.3
224	2415038.8	1	— 0.8	454	859.3	3	— 0.7
229	079.3	1	+ 0.2	455	867.1	2	— 0.8
231	094.8	2	— 0.2	457	883 0	2	— 0.7
232	102.1	1	— 0.8	459	900.0	3	+ 0.4
233	110.8	2	0.0	461	915.2	2	— 0.2
236	134.8	1	+ 0 3	467	963.0	2	+ 0.1
269	395.2	1	— 0.5	860	2420073.25	10	— 0.22
270	403 2	3	— 0.4				

Wilno, 1924. V. 24.

WŁ. DZIEWULSKI.

On the variable star RT Aurigae.

I observed in Cracow since November 17th 1911 until April 3^{d} 1915 the variable star RT Aurigae, following the method of *Argelander*. I made on the whole 82 observations with a four inches short focus refractor. For reference I used the following stars (the magnitudes are taken from the Potsdam Catalogue = P. D.):

star	P D.	Steps
B. D. + 29° 1154	4.m 56	25.2
28 1168	5. 50	16.5
29 1327	5. 56	12 8
29 1293	6 19	9.7
28 1196	6. 32	4.6
29 1190	6. 64	0.0

As starting point I took the elements of *Astbury*, namely:

Max. = J. D. 2417173.36 M. Greenwich T. + 3.7282 E.

According to the period of *Astbury* I calculated the phase of each observation and formed groups of observations; each group concluded preponderatingly 8 observations. I received the following mean values:

d.	st.	d.	st.
0.145	17.2	1.883	9.7
0.447	15.5	2.264	8.9
0.810	13.6	2.659	10.6
1.173	11.1	2 961	11.0
1.530	11.9	3.584	16.7

The mean error of each observation amounts to ± 2. 2, i. e. ± 0.m18 in the Potsdam scale.

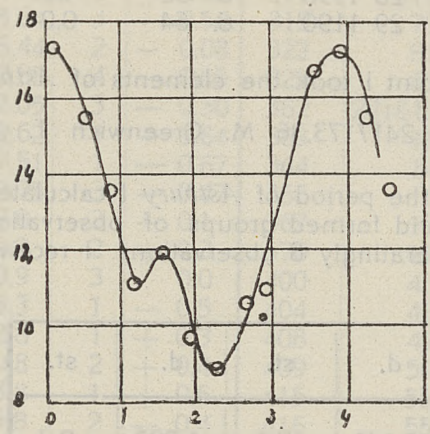
The curve represents the alterations of brightness of the star. I investigated especially the curve near the maximum and the minimum and I received the maximum for the moment 0.021, i. e. that the value of the mean epoch of the maximum, calculated with the elements of Astbury for my observations: J. D. 2419928.500, needs a correction + 0.d 021. This correction has no influence on the length of the period.

The primary maximum (17.6) results at the moment 0.02, the secondary minimum (11.1) — at 1.17, the secondary maximum (11.9) — at 1.53 and the primary minimum (8.4) — at 2.23. In my scale the brightness of RT Aurigae oscillates between 17.6 and 8.4, which corresponds to 5.m29 and 6.m05 of the Potsdam scale. The amplitude (0.m76) is smaller than that of *Astbury* (0.m98). *Hornig*[1]) got for the amplitude the value 1.m08 and *Viaro*[2]) — 0.m85. It may be

[1]) Astr. Nachr. Vol. 201, p. 153.

[2]) Osservazioni fotometriche della variabile RT Aurigae. Padova 1921.

mentioned, that *C. C. Kiess* [1]) found also a small correction for the moment of the maximum in comparison with the elements of *Astbury* and gave new elements, not very different from those of *Astbury.*



Wilno. 1924. VI. 7.

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[1]) Laws Observatory Bulletin № 23.