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I. ASTRONOMIE
№ 19

BIULETYN
OBSERWATORJUM ASTRONOMICZNEGO
W WILNIE

WILNO
1937
Wydano częściowo z zasiłku Funduszu Kultury Narodowej.
Zakłady Graficzne „ZNICZ", Wilno.

Bulletin

de

l'Observatoire astronomique

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WŁADYSŁAW DZIEWULSKI.

Obserwacje wizualne Nowej CP Lacertae.
Visual observations of Nova CP Lacertae.

(Komunikat zgłoszony na posiedzeniu w dniu 14.XII. 1936 r.).

When the Nova was bright, the observations were made with a Zeiss' binocular with 6-fold magnification; when it was weaker, the 15-cm short focus refractor was used.

Table I contains the comparison stars used during the observations. Their magnitudes were taken either from Henry Draper Catalogue or, for the weaker stars, from the determinations of M. Beyer[1]). The first column contains the designation of the star, the second — its name or the B. D. number, the third — their magnitude.

TABLE I.

Designation	Name of the star	Magn.	Designation	B. D.	Magn.
a	γ Cassiopeiae	2.25	h	+ 56°2727	5.42
b	β „	2.42	k	56 2746	6.05
c	α Cephei	2.60	m	55 2709	7.46
d	β „	3.32	n	54 2709	8.1
e	ζ „	3.62	p	54 2716	8.6
f	ι „	3.68	q	55 2706	9.03
g	ε „	4.23	r	54 2704	9.30
			s	54 2712	9.59
			t	g Beyer	10.17

The observations are given in table II, successive columns containing the moments of observations expressed in J. D. for the mean heliocentric Greenwich time, the estimates in relation to the stars given in table I and the deduced magnitudes.

[1]) Astronomische Nachrichten. Bd. 261. pg 143. 1937.

TABLE II.

J. D. M. Gr. hel. T.	Observations with Zeiss' binocular		Observations with short focus refractor	
	Estimates	Magn.	Estimates	Magn.
2428				
340.447	a 8 N, b 3 N 3 c	2.5		
341.395	c 4 N 6 e	3.0		
341.466	c 3 N 7 e	2.9		
342.392	c 6 N 5 e	3.2		
342.451	c 7 N 4 e, d 1 N 7 f	3.3		
343.399	c 7 N 4 e, d 2 N 6 f	3.3		
343.467	c 7 N 4 e, d 3 N 5 f	3.4		
345.408	e 1 N 4 g	3.8		
346.409	e 4 N 1 g	4.1		
346.474	e 6 N = g, N 8 h	4.3		
347.378	e 8 N, g 2 N 8 h	4.5		
348.401	e 8 N, g 2 N 8 h	4.5		
348.465	g 3 N 7 h	4.6	g 3 N 6 h	4.6
349.402	g 3 N 7 h	4.6	g 5 N 5 h	4.8
349.438			g 3 N 4 h	4.8*)
349.460	g 4 N 6 h	4.7	g 5 N 5 h	4.8
350.399	g 5 N 5 h	4.8	g 6 N 4 h	4.9
350.472	g 5 N 6 h	4.8	g 5 N 5 h	4.8
351.399	g 6 N 5 h	4.9	g 5 N 5 h	4.8
351.462	g 6 N 4 h	4.9	g 5 N 5 h	4.8
354.389	g 7 N 3 h	5.1		
354.390	g 6 N 1.5 h	5.1*)		
355.391	g 8 N 1 h	5.3		
356.388	h 1 N 7 k	5.5		
357.466	h 2 N 6 k	5.6		
358.381	h 3 N 6 k	5.6		
359.392	h 4 N 5 k	5.7		
361.381	h 7 N 2 k	5.9		
364.388	k 1 N 7 m	6.2		
365.380	k 2 N 6 m	6.4		
367.360	k 3 N 6 m	6 5		
368.382	k 4 N 5 m	6.7		
369.381	k 4 N 4 m	6.7		
370.390	k 4 N 5 m	6.7		
373.394	k 6 N 3 m	7.0		
374.373	k 6 N 2 m	7.1		
375.400	k 6 N 2 m	7.1		
376.377	k 6 N 2 m	7.1		
377.373	k 6 N 2 m	7.1		
378.365	k 6 N 1 m	7.2		
379.387	k 7 N 1 m	7.3		
380.381	k 7 N = m	7.4		
382.374	m 1 N 5 n	7.6		
386.382	m 3 N 4 n	7.7		
387.368	m 3 N 3 n	7.8		
388.351	m 4 N 2 n	7.9		
391.370	m 5 N 1 n	8.0		
397.357	m 6 N 1 n	8.0		

*) observed by W. Iwanowska.

J. D. M. Gr. hel. T.	Observations with Zeiss' binocular		Observations with short focus refractor	
	Estimates	Magn.	Estimates	Magn.
2428				
399.364	m 5 N 1 n	8.0		
400.478	m 6 N = n	8.1		
422.375			m 8 N 1 n	8.1
424.436			n 1 N 6 p	8.2
426.439			n 6 N 4 q	8.7
427.376			n 9 N 1 q	9.0
428.335			n 8 N 2 q	8.9
429.408			n 6 N 3 q	8.8
430.343			n 8 N 2 q	8.9
431.377			n 7 N 3 q	8.8
432.326			n 8 N 2 q	8.9
433.354			n 8 N 1 q	9.0
436.360			n 8 N 2 q	8.9
456.347			N = q	9.1
459.353			n 7 N 1 q	8.9
461.353			q 1 N 7 r	9.1
462.409			q 1 N 7 r	9.1
463.310			q 2 N 6 r	9.1
467.368			q 3 N 5 r	9.1
472.420			q 2 N 6 r	9.1
478.420			q 2 N 6 r	9.1
485.311			p 5 N 3 s, q 3 N 3 r	9.2
488.353			q 2 N 4 r	9.1
532.192			r 4 N 5 t	9.7
543.223			r 3 N 6 t	9.6
547.329			r 3 N 6 t	9.6
548.319			r 4 N 5 t	9.7
549.321			r 4 N 5 t	9.7

Streszczenie.

Praca niniejsza obejmuje obserwacje Nowej CP Lacertae, wykonane zapomocą lornetki Zeissa i lunety krótkoogniskowej o średnicy objektywu 15 cm. Tablica I zawiera listę gwiazd porównania, do których nawiązywano obserwacje, by wyznaczyć wielkości Nowej. Tablica II zawiera zarówno same porównania, jak i wyliczone wielkości.

WŁADYSŁAW DZIEWULSKI.

Obserwacje wizualne Nowej DQ Herculis.

Visual observations of Nova DQ Herculis.

(Komunikat zgłoszony na posiedzeniu w dniu 14.XII. 1936 r.).

During the year 1936 the Nova DQ Herculis was observed with a Zeiss' binocular with 6-fold magnification and a 15 cm short focus refractor.

For the comparison some stars, used in the years 1934—35, were chosen. Their magnitudes were taken from № 899 of the Bulletin of the Harvard College Observatory and are given in table I; their designation is identical with that adopted in the Wilno Bulletin № 17.

TABLE I.

Designation	B. D.	Magnitude	
		adopted	calculated
a	+ 45° 2635	6.28	6.38
b	45 2643	7.29	7.02
c	46 2426	7.30	7.51
d	45 2652	8.22	8.17

The observations are given in table II, the successive columns containing the moments of observations, expressed in J. D. for the mean heliocentric Greenwich time, the estimates in relation to the stars given in table I and the deduced magnitudes.

TABLE II.

J. D. M. Gr. hel. T.	Observations with Zeiss' binocular		Observations with short focus refractor	
	Estimates	Magn.	Estimates	Magn.
2428				
215.412	a 2 N 7 b	6.5	a 3 N 6 b	6.6
217.416	a 2 N 7 b	6.5	a 2 N 7 b	6.5
235.378			a 7 N = b, N 6 c	7.0
251.358			a 7 N 1 b	6 9
252.350	a 5 N 3 b	6.8	N = b	7.0
253.501	a 3 N 5 b	6.6	a 5 N 3 b	6.8
254.412	a 3 N 5 b	6.6	a 4 N 4 b	6.7
255.449	a 5 N 3 b	6.8	a 5 N 3 b	6.8
256.414	a 6 N 3 b	6.8	a 7 N 2 b	6.9
257.399	a 5 N 4 b	6.7	a 7 N 2 b	6.9
267.354	a 5 N 3 b	6.8	b 1 N 5 c	7.1
273.422	a 4 N 2 b	6.8	b 2 N 4 c	7.2
274.446	a 4 N 2 b	6.8	b 2 N 4 c	7.2
275.351	a 5 N 2 b	6.8	b 1 N 5 c	7.1
276.415	a 4 N 3 b	6.7	b 2 N 5 c	7.2
278.442	a 6 N 2 b	6.9	b 3 N 4 c	7.2
281.388	a 5 N 2 b	6.8	b 1 N 5 c	7.1
291.393			b 1 N 5 c	7.1
293.379			b 2 N 4 c	7.2
302.394	a 6 N 1 b	6.9	b 3 N 4 c	7.2
305.372	a 4 N 3 b	6.7	b 3 N 3 c	7.3
306.394	a 3 N 3 b	6.7	b 2 N 4 c	7.2
307.384	a 3 N 3 b	6.7	b 2 N 4 c	7.2
308.388	a 4 N 3 b	6.7	b 2 N 4 c	7.2
311.452	a 3 N 3 b	6.7	b 1 N 5 c	7.1
312.387	a 3 N 3 b	6.7	b 2 N 4 c	7.2
314.419	a 5 N 1 b	6.9	b 3 N 3 c	7.3
315 444	a 6 N 1 b	6.9	b 2 N 5 c	7.2
334.410	a 4 N 1 b	6.8	b 1 N 5 c	7.1
336.462			b 1 N 4 c	7.2
341.431			b 2 N 4 c	7.2
342.399			b 2 N 4 c	7.2
343.459			b 2 N 4 c	7.2
346.470			b 2 N 4 c	7.2
348.415			b 3 N 3 c	7.3
349.408			b 3 N 3 c	7.3
350.474			b 2 N 4 c	7.2
351.455			b 3 N 3 c	7.3
402.450	c 3 N 5 d	7.8	c 3 N 4 d	7.8
404.360	c 2 N 5 d	7.7		
409.332	c = N	7.5		
414.320			c 3 N 3 d	7.8
417.360			c 3 N 5 d	7.8
422.376	c 1 N 7 d	7.6	c 4 N 4 d	7.8
426.351	c 2 N 5 d	7.7	c 3 N 4 d	7.8
427.376	c 2 N 5 d	7.7	c 3 N 5 d	7.8
428.390	c 2 N 6 d	7.7	c 3 N 6 d	7.7
429.406			c 3 N 5 d	7 8
430.342	c 2 N 6 d	7.7	c 4 N 5 d	7.8
431.376			c 3 N 6 d	7.7

J. D. M. Gr. hel. T.	Observations with Zeiss' binocular		Observations with short focus refractor	
	Estimates	Magn.	Estimates	Magn.
2428				
432.322	c 2 N 6 d	7.7	c 3 N 6 d	7.7
433.355	c 2 N 6 d	7.7	c 3 N 6 d	7.7
436 426	c 1 N 7 d	7.6	c 2 N 7 d	7.6
456.346	c 2 N 6 d	7.7	c 3 N 5 d	7.8
461.352	c 3 N 5 d	7.8	c 2 N 6 d	7.7
462.406			c 3 N 6 d	7.7
463.310	c 2 N 5 d	7.7	c 3 N 5 d	7.8
467.361			c 3 N 5 d	7.8
478 417			c 4 N 3 d	7.9
485.382			c 3 N 5 d	7.8
488.303			c 4 N 3 d	7.9
532.181			c 4 N 4 d	7.8
543.200			c 4 N 3 d	7.9
547.181			c 6 N 2 d	8.0

Streszczenie.

Praca niniejsza obejmuje dalszy ciąg obserwacyj Nowej DQ Herculis, wykonanych zapomocą lornetki Zeissa i lunety krótkoogniskowej o średnicy objektywu 15 cm. Tablica I zawiera listę gwiazd porównania, do których nawiązano obserwacje, by wyznaczyć wielkości Nowej. Tablica II zawiera zarówno same porównania, jak i wyliczone wielkości.

WŁODZIMIERZ ZONN.

Jasności Nowej CP Lacertae w dziedzinie fotograficznej i nadfioletowej.

Photographic and ultra-violet magnitudes of Nova CP Lacertae.

(Komunikat zgłoszony przez czł. Wł. Dziewulskiego na posiedzeniu w dn. 14.XII.1936).

The photographic observations of Nova CP Lacertae reported below extend from June 20 to September 21 1936. During 44 nights 92 intrafocal exposures without filter were obtained on Zeiss triplet ($f = 150$ cm, $d = 15$ cm) and 64 focal exposures with an ultra-violet filter (Wratten Nr 18 A) on Zeiss U. V. objective ($f = 150$ cm, $d = 16$ cm). All photographs were made on Lumière „Opta" plates. The exposures from June 20 to July 1 were made by Miss W. Iwanowska and Wł. Dziewulski and provisional results of the observations were published in A. N. 6213 and 6217. All further exposures were made by the writer.

When the Nova attained its maximum only few comparison stars of sufficient brightness were to be found on the plate. Therefore all the photographs were made with a grating placed in front of the objective. Each plate contained three photographs made immediately one after another with different times of exposure. These photographs were reduced as if made simultaneously, thus giving much more points for the reduction curve. The photometric constants of the gratings were obtained with the aid of the photographs of the Pleiades and amounted to 0^m87 for the exposures without filter and to 0^m98 for the other grating used for the U. V. photographs. When the Nova grew fainter the exposures were made without grating and reduced by comparison with the neighbouring stars. The measurements of the density of the photographic images were made by means of the thermoelectric photometer of the Wilno Observatory.

The magnitudes of the comparison stars were deduced from some photographs made with the grating with varying exposure time. They are given in Table I.

TABLE I.
Comparison stars.

B. D.	Sp	m_{phg}	$m_{u.v.}$	B. D.	Sp	m_{phg}	$m_{u,v.}$
		m	m			m	m
+ 56° 2741	F0	4.69	4.89	+ 54° 2683	B8	7.80	7.88
56 2727	F8	5.95	6.13	54 2740	B9	.96	8.22
56 2765	B8	6.02	5.90	54 2722	F0	8.01	—
55 2750	B8	.31	6.41	55 2713	A5	.17	.74
55 2679	B9	.36	.28	55 2724	K0	.59	
56 2755	B8	.39	.49	55 2710	A0	.66	
55 2695	B5	.92	.98	54 2709	K0	.67	
56 2746	K0	.95	7.59	54 2742	A5	.70	
55 2709	B9	7.16	.24	54 2702	K2	.70	
55 2714	A2	.16	.67	54 2727	B9	.72	
54 2708	B9	.50	.77	55 2723	A	.86	
53 2800	A0	.65	8.12	54 2732	A0	.89	
55 2729	B9	.70	7.78	54 2719	A2	9.02	
54 2741	F5	.78	.98				

The effective wavelength of both combinations of filter and plates amounted to 3700 Å for the U. V. exposures and 4300 Å for the intrafocal exposures without filter.

The magnitudes of the Nova and the corresponding moments of exposures expressed in Julian Days are given in Tables II and III. The light curves given in Fig. 1 show very similar run. Even some irregularities appearing in one curve can also be traced on the other. The colour equivalent $m_{u.v.} - m_{phg}$ is represented by the curve in the lower part of Fig. 1. This curve shows a distinct minimum about J. D. 2428344 i. e. five days after the maximum of brightness of the Nova. The colour equivalent in the case of Novae is but loosely connected with the energy distribution in the continuous spectrum as the light of Novae is due chiefly to bright emission bands. Therefore the present colour equivalent gives only some information about the intensity ratio of bright lines in the photographic and ultra-violet parts of the Nova spectrum. The ultra-violet range of the present combination of plate and filter falls into the region of the hydrogen continuous spectrum which probably appeared in emission; the photographic range contains besides H_γ and H_δ also some [O III] lines, mainly λ 4363, N_1 and N_2, the last ones lying at the limit of the sensitiveness of the plate. Hence the minimum of the colour equivalent at J. D. 2428344 corresponds to maximal intensity of the hydrogen emission. As subsequently the [O III] emission became relatively stron-

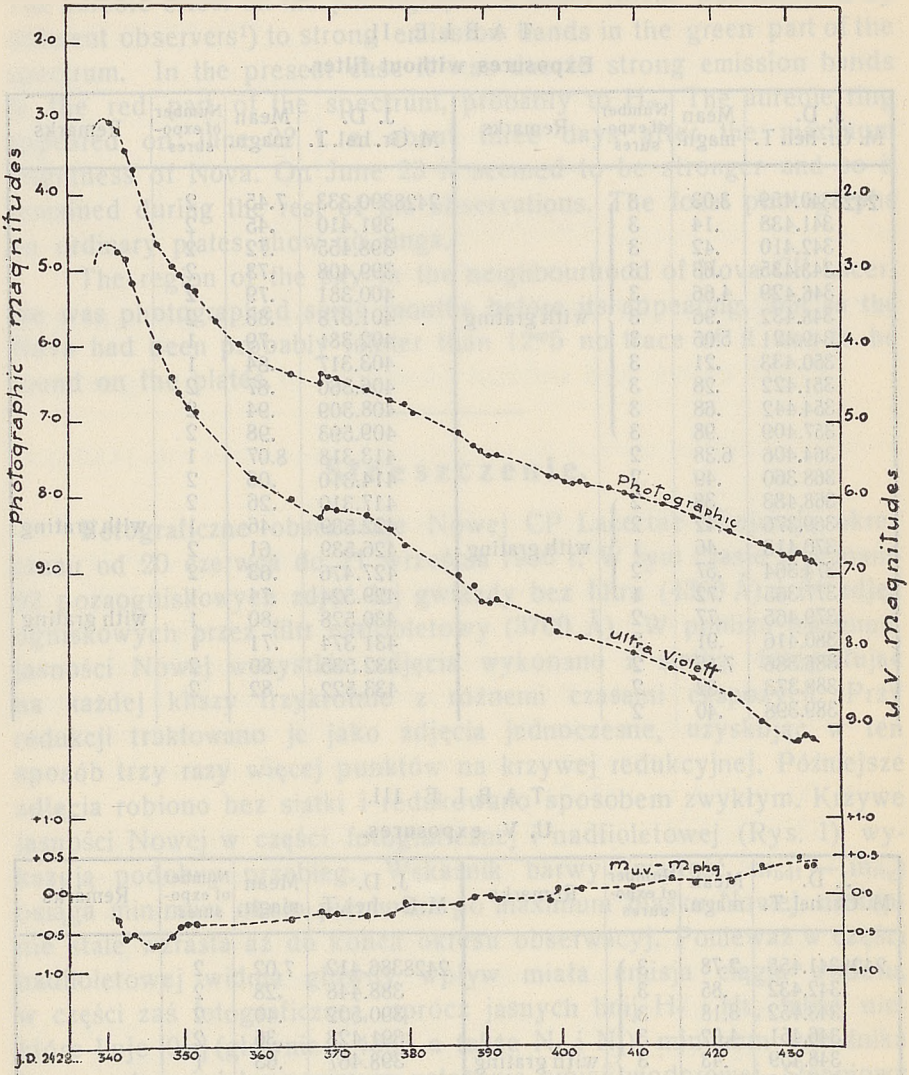

Fig. 1.

ger the colour equivalent of the Nova increased steadily up to the end of September.

The Nova was photographed also on panchromatic plates using a yellow filter, but a strong aureole affected then unfavourably the comparison with other stars. This aureole caused large systematic errors in magnitude depending chiefly upon the time of exposure; these photographs were therefore excluded from the investigations.

TABLE II.

Exposures without filter.

J. D. M. Gr. hel. T.	Mean magn.	Number of exposures	Remarks	J. D. M. Gr. hel. T.	Mean magn.	Number of exposures	Remarks
2428340.459	3.03	3		2428390.333	7.45	2	
341.438	.14	3		391.410	.45	2	
342.410	.42	3		398.455	.72	2	
343.435	.68	3		399.408	.73	2	
346.429	4.66	3		400.381	.79	2	
348.432	.96	3	with grating	401.378	.83	2	
349.421	5.05	3		402.381	.79	1	
350.433	.21	3		403.317	.84	1	
351.422	.28	3		406.360	.87	2	
354.442	.68	3		408.309	.94	2	
357.409	.98	3		409.593	.98	2	
364.406	6.38	2		413.318	8.07	1	
368 360	.49	2		414.310	.06	2	
368.483	.38	2		417.310	.26	2	
369.376	.42	2		422.539	.46	1	with grating
370.413	.46	1	with grating	426.539	.61	2	
374.364	.57	2		427.476	.63	2	
377.365	.72	1		429.524	.74	1	
379.465	.77	2		430.528	.80	1	with grating
380.416	.91	2		431 374	.71	1	
386.386	7.16	2		432.535	.80	2	
388.373	.32	2		433.522	.82	2	
389.398	.40	2					

TABLE III.

U. V. exposures.

J. D. M. Gr. hel. T.	Mean magn.	Number of exposures	Remarks	J. D. M. Gr. hel. T.	Mean magn.	Number of exposures	Remarks
2428341.455	2.78	3		2428386.412	7.02	2	
342.432	.85	3		388.448	.28	2	
343.452	3.18	3		390.502	.40	2	
346.451	4.02	3		391.428	.36	2	
348.459	.43	3	with grating	398.467	.63	1	
349.443	.63	3		399.438	.78	2	
350.457	.82	3		402.400	.84	2	
351.438	.88	3		409.452	8.06	2	
359.406	5.77	2		414.344	.26	2	
364.476	6.02	2		417.290	.38	2	
368.387	.25	2		422.503	.60	1	
369.469	.12	2		426.601	.96	1	
370 498	.19	2	with grating	431 333	9.18	1	
374.441	.26	2		432.513	.14	2	
377.451	.42	2		433.606	.15	1	
379.506	.65	1	with grating				

The aureole effect on the photographs of other Novae was ascribed by different observers[1]) to strong emission bands in the green part of the spectrum. In the present case it was due to strong emission bands in the red part of the spectrum, probably to H_α. The aureole ring appeared on June 22 i. e. about three days after the maximum brightness of Nova. On June 23 it seemed to be stronger and so it remained during the rest of the observations. The focal photographs on ordinary plates show no rings.

The region of the sky in the neighbourhood of Nova CP Lacertae was photographed some months before its appearing, but as the Nova had been probably fainter than 12^m5 no trace of it was to be found on the plates.

Streszczenie.

Fotograficzne obserwacje Nowej CP Lacertae obejmują okres czasu od 20 czerwca do 21 września 1936 r. W tym czasie wykonano 92 pozaogniskowych zdjęć tej gwiazdy bez filtru (4300 Å) i 64 zdjęć ogniskowych przez filtr nadfioletowy (3700 Å). W pobliżu maximum jasności Nowej wszystkie zdjęcia wykonano z siatką, fotografując na każdej kliszy trzykrotnie z różnemi czasami ekspozycji. Przy redukcji traktowano je jako zdjęcia jednoczesne, uzyskując w ten sposób trzy razy więcej punktów na krzywej redukcyjnej. Późniejsze zdjęcia robiono bez siatki i redukowano sposobem zwykłym. Krzywe jasności Nowej w części fotograficznej i nadfioletowej (Rys. 1) wykazują podobny przebieg. Wskaźnik barwy (wartość $m_{ndf} - m_{ftg}$) osiąga minimum około pięciu dni po maximum blasku Nowej, następnie stale wzrasta aż do końca okresu obserwacyj. Ponieważ w części nadfioletowej widma główny wpływ miała emisja ciągła wodoru, w części zaś fotograficznej, oprócz jasnych linij H_γ i H_δ, także niektóre linje [O III] (głównie λ 4363 a także N_1 i N_2), minimum wskaźnika barwy odpowiadało maximum natężenia emisji wodorowej. Stopniowy wzrost wskaźnika barwy w późniejszym okresie tłomaczyć należy wzrostem względnego natężenia jasnych linij [O II].

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[1]) J. Stobbe. Über das photographische Sternbild der Nova DQ Herculis. A. N. 260 p. 263. 1936. — M. Wolf. Photographische Bilder der Nova (3.1901) Persei. A. N. 156 p. 253. 1901 and others.

WŁODZIMIERZ ZONN.

Krzywa jasności i elementy orbity gwiazdy BF Aurigae.

Light curve and orbital elements of BF Aurigae.

(Komunikat zgłoszony przez czł. Wł. Dziewulskiego na posiedzeniu w dn. 14.XII.1936).

The variability of the star BF Aurigae has been discovered by O. Morgenroth[1]). This star is B. D. $+41^{\circ}1051$, $\alpha_{1855} = 4^h\,54^m\,54^s$; $\delta_{1855} = +41^{\circ}\,4'.9$; Sp. Ao, its provisional name was 159.1935 Aur. From some old Wilno Observatory plates it has been possible to establish the character of its variability. The first approximate study of these plates made by the writer[2]) has shown that BF Aur belongs to eclipsing variables with the period 1.58319 days. Independently Piegza[3]) has established a similar character of its variability and found the period to 1.58322 days.

213 intrafocal exposures extending over the time interval from 1930 to 1934 have now been measured exactly on the thermoelectric photometer of Wilno Observatory. All photographs were made with the Zeiss triplet ($f = 150$ cm, $d = 15$ cm), using the Lumière „Opta" plates, the time of exposure being about 15 min. The plates were developed with „Rodinal" 1 : 20.

The magnitudes of the comparison stars were determined from six exposures with a wire grating placed in front of the objective. The reduction of the measurements was made graphically assuming the photometric constant of the grating to $0^m.87$ (empirical value). As the comparison stars were situated very closely no corrections were applied for the differential extinction and for the position on the plate. The values thus obtained are given in table I.

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[1]) A. N. 255, p. 425. 1935.
[2]) A. N. 257, p. 391. 1935.
[3]) Acta Astronomica Ser. c. Vol. II, p. 125. 1935.

TABLE I.
Comparison stars.

B. D.	Sp.	Magn.
°		m
+ 41 1075	B9	8.58
41 1046	B9	.66
40 1171	F5	.80
41 1038	—	.96
41 1082	A2	.96
41 1031	—	9.04
41 1079	—	.06
40 1164	F5	.23
41 1057	—	.38

The magnitudes of the variable were deduced for each exposure separately from the relation between the galvanometer reading and the magnitudes of the comparison stars. The results were then grouped according to phases in 40 normal places each containing from 2 to 10 observations. The phases (in fractions of the period), the magnitudes and the number of observations for each normal place are given in Table II.

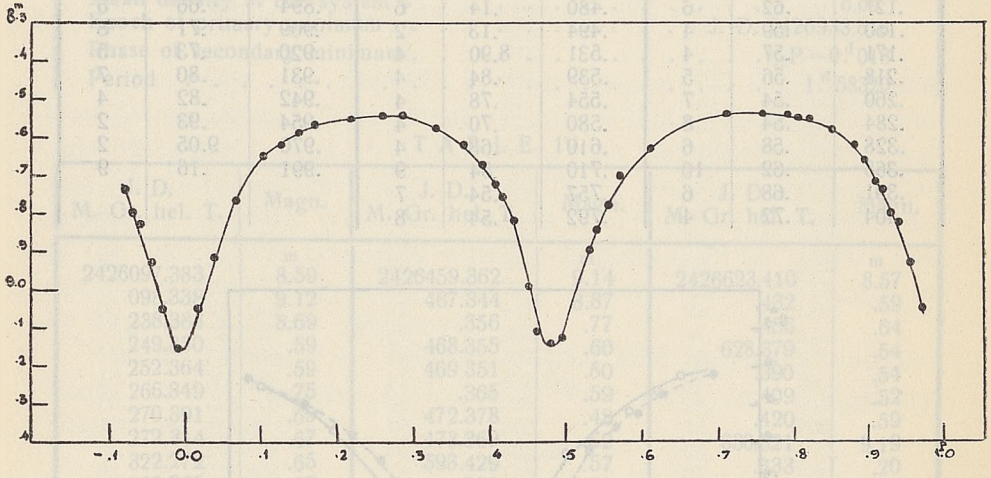

Fig. 1

Fig. 1 represents the light curve of BF Aurigae. The results of individual exposures are collected in Table IV. The dispersion of single observations from the normal curve $\left(\sqrt{\frac{[\delta\delta]}{n}}\right)$ amounts to $\pm$ 0^{m}037.

The magnitude of BF Aurigae oscillates between 8^{m}54 (maximum) and 9^{m}15 (minimum), the primary and the secondary minimum being of equal depth. The curve shows an excentricity effect as the secondary minimum does not cut the interval between successive primary minima into equal parts. The phase of the secondary minimum is 0^{p}489 i. e. 0^{p}011 before half a period. This can be distinctly seen in Fig. 2, where the primary (open circles) and secondary (full circles) minimum are shown together, the phase of the latter being reduced by 0^{p}500. As there is no indication that the two minima

differ considerably in duration, the longitude of periastron ω may be taken as 180°. Hence the approximate value of the excentricity of the orbit amounts to 0.02 (the value of inclination i being taken from Table III given below).

TABLE II.

Normal places.

Phase	Magn.	Number of observ.	Phase	Magn.	Number of observ.	Phase	Magn.	Number of observ.
p	m		p	m		p	m	
0.014	9.05	6	0.416	8.76	4	0.804	8.55	7
.038	8.91	6	.430	.82	4	.820	.55	6
.064	.76	2	.449	9.00	2	.849	.58	9
.102	.65	6	.461	.11	2	.881	.62	5
.127	.62	6	.480	.14	6	.894	.66	5
.150	.59	4	.494	.13	2	.909	.71	8
.171	.57	4	.531	8.90	4	.920	.73	5
.218	.56	5	.539	.84	4	.931	.80	7
.260	.54	7	.554	.78	4	.942	.82	4
.284	.54	8	.580	.70	4	.954	.93	2
.328	.58	6	.610	.63	4	.970	9.05	2
.365	.62	10	.710	.54	9	.991	.16	9
.391	.68	6	.757	.54	7			
.404	.72	4	.792	.54	8			

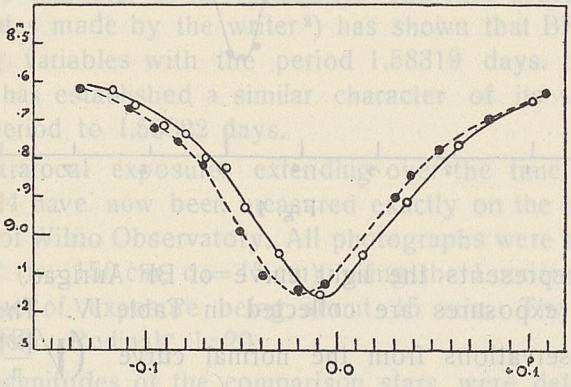

Fig. 2.

The orbital elements of this eclipsing binary were deduced by the well known Russell's method assuming the U hypothesis. The light curve had been „rectified" by the aid of the formula: $l = l_0 (1 - z \cos^2\theta)^{1/2}$ reducing its amplitude to 0m26. Owing to the small depth of both minima the solution gives rather uncertain values of the elements, and the present determination must be regarded as a provisional one. The orbital elements of BF Aurigae thus obtained are given in Table III.

TABLE III.

Summary of results.

Uniform solution.	
Nature of eclipses	partial
Loss of light $1-\lambda_1 = 1-\lambda_2$	0.217
Ratio of axes of the stars k	1.00
Maximum obscuration α_0	0.434
Inclination of orbit i	74°3
Major semi-axis of both stars $a_1 = a_2$	0.346
Minor semi-axis of both stars $b_1 = b_2$	0.288
$e \cos \omega$ (e—excentricity of the orbit, ω—longitude of periastron)	— 0.017
Ratio of surface brightness J_1/J_2	1.00
Light of first component L_1	0.50
Light of second component L_2	0.50
Mean density of the system ρ	0.09
Epoch of primary minimum	J. D. 2426933.518
Phase of secondary minimum	$^1/_2$P—0^d.018
Period	1^d.58320

TABLE IV.

J. D. M. Gr. hel. T.	Magn.	J. D. M. Gr. hel. T.	Magn.	J. D. M. Gr. hel. T.	Magn.
	m		m		m
2426097.383	8.59	2426459.362	9.14	2426623.410	8.57
098.338	9.12	467.344	8.87	.432	.59
238.384	8.69	.356	.77	.456	.64
249.350	.59	468.355	.60	628.379	.54
252.364	.59	469.351	.50	.390	.54
266.349	.75	.365	.59	.409	.52
270.391	.69	472.378	.48	.420	.59
272.314	.67	473.369	.62	630.321	9.19
322.272	.65	593.429	.57	.333	.20
365.269	.77	.532	.59	.389	8.95
382.322	.54	.547	.56	.400	.92
415.324	.52	594.399	.54	631.376	.54
418.260	.87	.414	.56	.386	.59
419.337	.54	.440	.52	637.376	.84
.354	.56	.462	.59	.387	.81
421.348	9.10	595.421	.84	651.396	.57
422.313	8.66	.432	.97	.407	.59
.327	.59	.445	9.02	.420	.54
430.319	.59	.456	.10	.432	.55
435.271	.55	596.325	.06	652.321	.59
436.314	.84	.340	.02	.334	.73
.362	9.09	599.464	.14	.345	.69
439.336	8.59	.477	.17	674.189	.52
440.317	9.17	.489	.06	678.189	.61
.328	.11	.508	.07	.203	.54
446.323	8.59	610.415	8.75	680.260	.96
.346	.51	.428	.80	.271	.89
448.333	.87	622.486	.85	.370	.68
.345	.80	.498	.84	.382	.68
450.330	.55	.516	.75	706.192	.73
.341	.54	.527	.74	.208	.77
459.350	9.12	623.398	.64	764.456	.57

TABLE IV (continued).

J. D. M. Gr. hel. T.	Magn.	J. D. M. Gr. hel. T.	Magn.	J. D. M. Gr. hel. T.	Magn.
	m		m		m
2426766.281	8.66	2427156.394	8.53	2427387.300	8.59
.295	.60	.408	.55	397.218	.67
769.383	.59	.425	.52	.233	.69
.398	.59	.440	.52	.244	.74
770.348	.79	.455	.54	.255	.70
.359	.80	.468	.54	.267	.76
807.399	.56	.485	.57	.278	.73
.414	.59	158.262	.90	.290	.79
823.348	.79	.277	.96	.301	.79
.362	.80	.293	9.01	399.392	.51
2427030.292	.64	.311	.16	.405	.58
.304	.64	.326	.17	.417	.49
031.257	.57	.341	.16	.431	.52
062.339	.60	.358	.08	.442	.58
.352	.64	.379	.01	.454	.54
.392	.66	.396	8.92	.465	.59
089.280	.62	.413	.88	.476	.59
.293	.65	.428	.88	666.356	.59
090.257	9.11	.443	.76	.508	9.14
.270	.14	161.290	.55	667.512	8.64
091.435	8.57	.305	.54	668.389	.54
097.183	.59	.320	.59	669.518	.66
.195	.63	.335	.59	672.512	.50
.220	.68	.348	.62	.550	.58
.232	.69	.360	.74	673.500	.64
.244	.69	.374	.72	684.502	.56
.263	.75	.385	.76	685.530	9.17
.274	.80	.397	.83	689.383	8.84
.286	.80	363.478	.74	690.506	.61
150.243	.59	.493	.65	691.425	.55
.259	.67	.506	.67	692.538	.71
.274	.69	365.404	.48	694.473	.52
.288	.70	.417	.54	696.520	.86
.306	.69	.429	.59	697.506	.85
.320	.76	.483	.62	698.467	.56
.333	.81	.494	.61	699.517	.55
156.282	.52	367.382	.96	700.550	9.09
.297	.52	387.278	.65	710.484	8.49
.360	.54	.289	.65	720.546	.65

Streszczenie.

Praca niniejsza zawiera wyniki pomiarów jasności zmiennej zaćmieniowej BF Aurigae na 213 zdjęciach pozaogniskowych, oraz wyznaczone na podstawie tych pomiarów prowizoryczne elementy orbity tej gwiazdy. Wszystkie zdjęcia zmierzono na fotometrze termoelektrycznym i następnie zredukowano na podstawie wielkości gwiazd porównania (tab. I). Z uzyskanych jasności gwiazdy badanej (tab. IV) utworzono grupy według faz i otrzymano średnią krzywą jasności (rys. 1, tab. II). Wykazuje ona wyraźny efekt ekscentryczności orbity (rys. 2). Elementy orbity BF Aurigae otrzymano metodą Russell'a (tab. III) przy założeniu, że obie gwiazdy posiadają równomiernie świecące tarcze (hypoteza U).

WŁADYSŁAW DZIEWULSKI.

O jasności komety 1936-a (Peltier).

On the brightness of the comet 1936-a (Peltier).

(Komunikat zgłoszony na posiedzeniu w dniu 14.XII. 1936 r.).

This comet was observed at Morozowicze (150 km. southward from Wilno) with a Zeiss' binocular with 6-fold magnification from July 19th until August 1st 1936. During the observations the focal and extrafocal images of the comet were compared with similar images of the stars. When focal images were observed, the brightness of the nucleus was compared with the brightness of the stars. The same procedure was applied, when the comet was bright enough to be observed with the naked eye.

Table I contains the comparison stars used during the observations. The brightnesses of the stars were taken from the Henry Draper Catalogue.

TABLE I.

Design.	Name and B. D.	Magn.	Design.	Name and B. D.	Magn.
a	+ 58° 2545	4.93	n	o And = 41° 4664	3.63
b	56 2966	5.65	p	10 Lac = 38 4826	4.91
c	56 2999	6.76	q	39 4964	5.94
d	56 2923	5.48	r	32 4352	4.38
e	57 2748	4.89	s	η Peg = 29 4741	3.10
f	3 And = 49 4028	4.91	t	π Peg = 32 4352	4.38
g	48 3887	5.10	u	32 Peg = 27 4299	4.88
h	8 And = 48 3991	4.99	v	ι Peg = 24 4533	3.96
k	6 Lac = 42 4420	4.54	w	μ Per = 23 4615	3.67
l	11 Lac = 43 4266	4.64	x	λ Per = 22 4709	4.14
m	15 Lac = 42 4521	5.17	y	ε Per = 9 4891	2.54
			z	7 Per = 11 4696	5.59

Table II and III include the observations and the resulting magnitudes of the comet.

TABLE II.

Date	Observations with Zeiss' binocular					
	M. astr. Gr. T.	Focal estimates	Magn.	M. astr. Gr. T.	Extrafocal estimates	Magn.
1936	h m			h m		
19 VII	9 16	b 4 ⋜ 5 c	6.1	9 15	a 3 ⋜ 3 b	5.3
20 VII	9 24	a 3 ⋜ 6 d	5.1	9 30	e 5 ⋜ 2 d	5.3
23 VII	9 31	f 6 ⋜ 2 g	5.0	9 32	f 2 ⋜ 6 g	5.0
24 VII	9 01	f 6 ⋜ 2 g	5.0	9 02	h 3 ⋜, f 1 ⋜ 6 g	5.0
25 VII	9 38	h 7 ⋜, f 4 ⋜ 4 g	5.0	9 40	h 2 ⋜ 1 f	4.9
26 VII	9 07	l 5 ⋜ 3 m	5.0	9 08	k 7 ⋜ 1 l	4.6
27 VII	9 02	n 8 ⋜, p = ⋜ 4 q	5.0	9 03	n 6 ⋜ 3 p	4.5
28 VII	8 35	n 7 ⋜ 1 p	4.8	8 37	n 2 ⋜ 6 p	4.0
29 VII	9 10	t 4 ⋜ 4 u	4.6	9 12	s 6 ⋜ 4 t	4.0
30 VII	9 10	s 8 ⋜, v 4 ⋜ 3 u	4.4	9 11	s 5 ⋜, v 1 ⋜ 6 u	4.0
1 VIII	8 48	w 10 ⋜ 5 z	4.9	8 50	w 6 ⋜ 4 x	4.0

TABLE III.

Date	Observations with the naked eye		
	M. astr. Gr. T.	Estimates	Magn.
1936	h m		
28 VII	9 20	n 4 ⋜ 4 r	4.0
29 VII	9 14	s 3 ⋜ 6 t	3.5
30 VII	9 45	s 4 ⋜ 4 v	3.5
1 VIII	8 52	y 3 ⋜	3.2

The tail of the comet was determined with the same binocular:
1936 24 VII $9^h 08^m$ M. astr. Gr. T. position angle 253°, the tail is 30′ long,
„ 27 VII 9 10 „ „ „ 232 „ „ „ 40 „
„ 28 VII 8 55 „ „ „ 214 „ „ „ 38 „
„ 29 VII 9 25 „ „ „ 229 „ „ „ 40 „
„ 30 VII 10 15 „ „ „ 236 „ „ „ 75 „

Streszczenie.

Obserwacje jasności komety wykonano w Morozowiczach (w woj. nowogródzkiem), odległych o 150 km. od Wilna w kierunku południowym. Obserwowano głównie lornetką Zeissa zarówno obrazy ogniskowe, jak i pozaogniskowe. Tablica I zawiera spis gwiazd porównania. Tablica II i III zawierają obserwacje. W ciągu kilku dni wyznaczano kierunek i długość warkocza.

WŁADYSŁAW DZIEWULSKI.

Obserwacje meteorów.

Observations of meteors.

(Komunikat zgłoszony na posiedzeniu w dniu 14. XII. 1936 r.).

During the observations of variable stars in 1935 and 1936 I occasionally observed the meteors. The details of the observations are given below.

№	Date	M. Greenwich T. civil	Beginning		End		Magnitude	Duration
			α	δ	α	δ		
	1935	h m s	h m	°	h m	°	m	s
1	24 II	19 07 56	14 40	+ 72	20 50	+ 70	3	2
2	30 III	21 22 10	22 50	63	0 10	56	3	2
3	22 IV	22 02 14	10 45	27	10 05	8	4	1
4	10 V	22 04 38	17 30	44	18 20	27	4	2
5	25 V	21 03 46	14 10	43	13 20	19	2	2
6	9 VI	20 59 25	14 50	17	11 30	28	2	2
7	22 VI	21 41 15	21 05	43	21 40	29	1	1
8	24 VI	22 24 30	22 30	10	22 10	— 10	0	1
9	8 VIII	20 07 12	18 00	60	16 50	+ 75	2	2
10	8 VIII	20 08 50	1 20	35	2 00	22	2	1
11	8 VIII	20 38 50	18 40	23	20 20	14	3	1
12	8 VIII	20 44 10	16 25	12	15 40	20	3	1
13	27 VIII	19 52 54	21 20	27	0 50	50	1	2
14	6 IX	21 32 55	20 40	45	17 10	18	1	1
15	22 IX	20 02 31	21 10	44	20 20	33	3	1
16	1 X	20 01 50	20 30	29	16 50	56	3	2
17	1 X	20 13 06	0 50	14	1 40	— 5	4	2
18	14 X	16 43 12	23 50	23	23 10	+ 2	2	3
19	16 XI	20 04 51	5 00	64	6 30	68	3	2

№	Date	M. Greenwich T. civil	Beginning		End		Magnitude	Duration
			α	δ	α	δ		
	1936	h m s	h m	°	h m	°	m	s
20	27 III	22 18 46	17 50	+ 54	21 10	+ 57	3	1
21	28 III	22 35 20	11 20	69	6 00	58	2	2
22	15 IV	21 46 40	6 55	33	6 00	39	2	4
23	15 IV	22 23 07	16 25	23	15 20	18	4	2
24	15 IV	22 51 08	14 00	19	13 45	— 8	2	3
25	17 IV	21 52 48	19 20	75	4 30	+ 79	4	1
26	22 V	22 04 39	20 30	58	0 10	52	2	2
27 [1])	26 VI	22 18 00	18 00	35	19 00	20	—	3
28	21 VIII	22 31 52	20 05	14	20 40	2	3	1
29	12 IX	22 21 50	5 30	28	5 10	12	3	1
30	18 IX	19 18 05	19 00	5	16 30	11	3	1
31	14 X	20 44 16	5 50	35	3 55	18	2	2
32 [2])	17 X	20 25 12	22 30	28	22 20	— 8	— 2	3
33	19 X	19 25 47	7 20	75	2 00	+ 45	3	1
34	20 X	20 50 47	16 00	55	18 20	35	1	2
35	16 XI	19 47 51	21 20	43	23 10	35	3	3
36	16 XI	19 55 03	3 55	15	4 15	— 6	1	2

[1]) This meteor was observed through the refractor; its direction was determined but neither the beginning nor the ending could be observed.

[2]) The meteor left a bright train which persisted a few seconds.

Streszczenie.

W czasie obserwacyj gwiazd zmiennych przygodnie obserwowałem meteory. Wykaz ich zawiera powyżej podana tablica.

№	Data	M. Greenwich T. civil	Beginning		End		Magnitude	Duration
			α	δ	α	δ		
	1935	h m s	h m	°	h m	°	m	s
20	27 III	22 16 46	17 50	+24	21 12	+57	5	1
21	28 III	22 35 20	11 20	60	6 00	58	2	2
22	15 IV	21 38 40	8 35	65	8 00	20	2	1
23	15 IV	22 23 07	16 25	22	15 20	18	4	2
24	16 IV	22 51 08	14 00	10	13 40	− 8	2	3
25	17 IV	21 52 48	10 30	75	4 30	+79	3	1
26	22 V	22 04 30	20 30	58	0 10	52	2	2
27 [1]	26 VI	22 10 00	18 00	35	19 00	20	—	3
28	21 VIII	22 31 52	20 05	14	20 40	2	3	1
29	12 IX	22 21 50	1 30	26	3 10	12	3	1
30	13 IX	19 18 06	19 00	5	18 20	11	3	1
31	14 X	20 44 16	5 30	25	2 55	18	2	2
32 [2]	17 X	20 28 12	22 30	28	22 00	− 5	−2	3
33	18 X	18 26 47	7 20	75	2 00	+45	3	1
34	20 X	20 30 47	19 00	55	18 20	33	1	2
35	18 XI	19 47 51	21 20	43	23 10	32	3	3
36	19 XI	19 05 00	5 35	15	4 15	− 6	1	2

1) This meteor was observed through the refractor, its direction was determined but neither the beginning nor the ending could be observed.

2) The meteor left a bright train which persisted a few seconds.

Streszczenie.

W czasie obserwacyj gwiazd zmiennych przygodnie obserwowano meteory. Wykaz ich zawiera powyżej podana tablica.

SOMMAIRE.

Wł. Dziewulski. Obserwacje wizualne Nowej CP Lacertae 3
Visual observations of Nova CP Lacertae . . . . . „

Wł. Dziewulski. Obserwacje wizualne Nowej DQ Herculis 6
Visual observations of Nova DQ Herculis . . . . . „

W. Zonn. Jasności Nowej CP Lacertae w dziedzinie fotograficznej i nadfioletowej 9
Photographic and ultra-violet magnitudes of Nova CP Lacertae . „

W. Zonn. Krzywa jasności i elementy orbity gwiazdy BF Aurigae . . . 14
Light curve and orbital elements of BF Aurigae . . . . . „

Wł. Dziewulski. O jasności komety 1936-a (Peltier) 19
On the brightness of the comet 1936-a (Peltier) . . . . . „

Wł. Dziewulski. Obserwacje meteorów 21
Observations of meteors . . . . . „