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liams College Observatory possesses, procured of the firm of BUFF & BURGER, formerly of 9 Province Court, Boston. The circle alluded to was made by WAGENER of Berlin, and is excellently well made so far as I can judge. It has the smaller dimensions described in the German books. The sextants which the College possesses include an older one by a good firm, SPENCER, BROWNING & RUST, of London, which was purchased of an old ship captain, who found it so difficult to read off that he supposed his eyesight was in fault. Consequently it was redivided by JOHN BLISS & Co., 128 Front Street, New York City, a well-known firm of dealers in nautical instruments. At a future time I hope its errors will be investigated by my pupils. The College possesses all the necessary apparatus for the purpose. The chief advantage in the prismatic circle of PISTOR and MARTINS, or those like them, is that as a circle it enables the observer to eliminate at once the eccentricity of the alhidade by reading the two opposite verniers.

For the other advantages of this instrument see page 130 of Volume II of CHAUVENET's "Manual," a book which is preferred by our students, from easily understood causes, to BRÜNNOW's English translation of his own spherical astronomy, and, of course, to DOOLITTLE's "Practical Astronomy," and other similar smaller works. The smaller dimensions of the prismatic circle require more delicate handling than the larger. Those who wish to see how the circle of larger dimensions endures the tests made under very unfavorable circumstances of transportation, &c., may be referred to Prof. BACKLAND's paper, "*Astronomische Ortsbestimmungen von Nördlichen Russland*," in Vol. 7 of the *Mélanges Mathématiques et Astronomiques.*

Williams College Observatory.

SOUTHERN VARIABLES,

BY R. T. A. INNES.

[Communicated by Dr. DAVID GILL, C.B., etc., H.M. Astronomer at the Cape of Good Hope.]

On page (94) of Vol. I of the *Cape Photographic Durchmusterung*, Professor KAPTEYN remarks that the variability of the star at $17^h\ 49^m\ 32^s$, $-49°\ 24'.9$ (1875) is all but proved by the Cape "*Carte du ciel*" plates. This star is C.P.D. $-49°10361$. Observations were commenced in May, 1898, and soon showed a range of magnitude from $9^M.0$ to $9^M.8$, but it was not until the night of Oct. 3, 1899, that its period was even roughly ascertained. It was then found to have a period of under $7^h\ 30^m$. The shortness of this period put many of the observations out of count, as the date only, without the hour and minute, had been recorded.

The remaining observations are annexed. Assuming a period of $0^d.3115$ (or about $7^h\ 28^m\ 36^s$) and reducing all the observations to the period Oct. 3, 1899, $7^h\ 30^m$ to 15^h, they have been plotted. I have drawn two curves through the observations, and the deviations from one or the other are well within the errors of observation. The observations have been corrected for the light equation, before being plotted, by the formula

$$-7^m.5 \cos (\odot - 88°)$$

The range of magnitude is from $8^M.9$ to $9^M.75$, and the form of either curve much resembles that of ordinary long-period variables. Excluding cluster-variables, this is the shortest period variable known. As to the two curves even and odd maxima will not account for them. All that has been derived with any certainty is the average period and amplitude of the curve. Observations extending over 8 or 9 hours or more, on several successive evenings, will throw further light on the variations of the curve. These will be undertaken in due course. Meanwhile, it may be pointed out that the curve seems to be subject to irregularities analogous to that of *Mira Ceti.*

GILLIS's Polar Zones 9192. $9^M.0$.

$13^h\ 9^m\ 32^s$, $-83°\ 34'.1$.

This star is included in one of Professor KAPTEYN's lists of stars not found on the C.P.D. plates. It is variable:

		M
1899 Aug.	4	10.2
	9	10±
	17	10.3 (red)
Sept.	1	9.9
	. . . . .	
Oct.	6	8.7
	10	8.2 red 6.5
	14	8.2
	18	7.7
	22	7.7 red

1850. *S Pictoris.* (*A.J.* 468.)

A maximum occurred in August, 1899:

		M
1899 May	31	invisible
Aug.	27	8.3 red 6
Sept.	30	9.1 red 7.5
Oct.	3	9.25 red 8
	10	9.4
	22	9.7

Between the different observed maxima (or thereabouts) I find the following intervals and periods with their estimated extreme errors:

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$5076^d \pm 35^d$	$= 423^d \pm 3^d$	12 periods
820 ± 20	$= 410 \pm 10$	2
1728 ± 12	$= 432 \pm 3$	4
1758 ± 4	$= 439 \pm 1$	4

or an average period of $428^d \pm 5^d$.

C.P.D. −41°1681. (*A.J.* 468.)

Dr. Roberts of Lovedale, has kindly informed me that the period of this *Algol*-variable is about $6^d.44$, and not $12^d.906$ as I had supposed. My observations are not inconsistent with the shorter period, and a re-reduction of them also gives $6^d.44$. To use the C.P D. *minimum* of 1890 May 10, we must suppose 515 intervals and a period of $6^d.4423$.

Ö.A. 13441. (*A.J.* 468.)

Observations of a recent maximum give a new interpretation to the old observations. The rise to a maximum is very sudden, with a long stay there — fading not more than $0^M.4$ in 50 days.

Hence the Cape observations may be taken thus:

		Max.	O—C
		M	d
	1899 Aug. 10	8.4	0
	1898 Aug. 27	8.8	− 3
	1897 Sept. 24	8.8	+ 5
	1896 Oct. 1	9.0	− 9
And Cordoba	1879 June 29	8.75	−82
Argelander	1851 May 20	8.0	0

The column O—C assumes a period of 345^d, but the discordance of the Cordoba maximum is too large to allow this result much weight.

Observations of C.P.D. 49°10361.

1899	C.M.T.	Mag.	1899	C.M.T.	Mag.	1899	C.M.T.	Mag.	1899	C.M.T.	Mag.
	h m			h m			h m			h m	
July 18	8 50	9.5	Sept. 24	8 18	9.65	Oct. 3	10 26	8.9	Oct. 13	10 4	9.25
19	7 28	9.65	25	6 56	9.0		10 33	8.9		10 20	9.35
22	7 24	9.4		7 27	9.0		10 45	8.95	14	6 56	9.0
26	6 20	9.1		9 57	9.4		10 54	9.1		8 4	9.25
27	6 12	9.4		10 47	9.5		11 7	8.9		8 14	9.25
28	5 42	9.75	26	6 50	9.4		11 21	9.1		8 26	9.4
Aug. 4	8 13	9.0		7 18	9.4		11 23	9.2	18	6 57	9.65 twi.
14	6 28±	9.0		8 50	9.4		11 30	9.25		7 11	9.6
16	9 44	9.6	27	6 42	9.55		11 36	9.3 low		7 34	9.4
17	6 30	9.75		7 24	9.5		11 42	9.3 low		7 39	9.3
31	11 43	9.3		8 13	9.65		11 47	9.3 low		7 42	9.3
Sept. 1	7 22	9.4	28	6 53	9.65	6	6 50	9.5 twi.		7 47	9.25
2	6 57	9.2	30	8 38	9.35		7 12	9.6		7 58	9.15
	8 29	9.3	Oct. 1	7 56	9.5		7 29	9.65		8 5	9.05
12	7 9	9.45		8 29	9.5		7 57	9.65		8 19	9.0
	8 37	9.6	3	8 6	9.75	10	7 2	9.3	22	7 8	9.67
16	7 26	9.1		9 14	9.7		7 11	9.4		7 16	9.7
17	10 18	9.65		9 47	9.55		7 23	9.35		7 38	9.65 Decid'ly brighter
18	9 53	9.55		9 50	9.3		7 45	9.45		7 55	9.7
19	6 34	9.6		9 52	9.2		8 14	9.45		8 17	9.7
	7 14	9.65		9 54	9.1		8 33	9.5	24	7 2	9.35
	8 13	9.6		9 58	9.0		8 49	9.6		7 16	9.4
20	9 6	9.4		10 4	9.05		9 7	9.6 good		7 55	9.4
23	7 34	9.65		10 12	9.0		9 17	9.55		8 16	9.5
24	7 32	9.7		10 20	8.9	13	9 48	9.2			

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