1894. — 10 observations at Greenwich, Feb. 20–Mar. 27; 10 at Paris, Mar. 10–Mar. 24.

1895. — 6 observations at Greenwich, June 5–July 9; 9 at Toulouse, June 15–July 6.

1896. — 4 observations at Greenwich, Sept. 9–Oct. 23.

1897. — 9 observations at Greenwich, Nov. 30–Dec. 31.

The dates of the normals are for Greenwich mean noon, and the given values of the coördinates are *true* not *apparent*. In the column headed No. Obs. where there are two numbers, the first belongs to the R.A., and the second to the Decl.; where but one number is given this is common to both. In the preceding list the number of observations given is that of R.A. (except in one case where there was none).

NORMAL POSITIONS OF *Ceres*.

Date	True R.A.	True Decl.	No. Obs.
	h m s	° ′ ″	
1801 Jan. 21	3 26 31.25	+16 57 21.6	22–21
1802 Mar. 31	12 2 57.76	+17 59 48.4	84–80
1803 July 8	18 37 7.29	−28 44 23.2	78–67
1804 Oct. 1	0 37 34.42	−12 53 56.6	51–49
1806 Jan. 21	6 41 58.91	+30 34 28.2	12–11
1807 May 6	14 50 31.06	− 5 18 26.0	61
1808 Aug. 10	21 15 12.22	−29 25 56.6	31–29
1809 Nov. 3	2 45 57.21	+ 4 54 55.8	16
1811 Feb. 24	10 29 53.65	+27 0 41.2	23
1812 June 12	17 18 55.70	−23 7 54.0	15
1813 Sept. 11	23 36 0.01	−20 0 20.4	14
1816 Apr. 12	13 26 22.53	+ 7 10 41.5	16–15
1818 Oct. 13	1 41 7.26	− 4 33 4.8	13
1820 Feb. 7	8 28 46.06	+31 56 48.4	8–7
1821 May 25	15 58 28.54	−14 53 8.3	19
1822 Aug. 24	22 26 18.54	−25 50 22.0	9–8
1823 Nov. 24	3 49 43.11	+13 48 45.5	8–6
1825 Mar. 19	12 2 38.57	+18 26 28.2	22
1826 June 28	18 37 13.12	−27 55 32.5	10
1827 Sept. 26	0 36 36.66	−13 10 13.4	8
1829 Jan. 30	6 24 16.94	+30 40 39.0	3
1830 May 1	14 43 30.55	− 4 9 0.1	43
1831 July 29	21 18 10.16	−28 36 19.4	14–10
1832 Oct. 31	2 40 56.18	+ 4 4 6.4	16–10
1834 Feb. 17	10 21 31.16	+27 17 46.5	42–41
1835 June 10	17 14 5.88	−22 35 32.3	31
1836 Sept. 10	23 30 5.77	−19 38 21.2	17–16
1837 Dec. 15	5 1 35.07	+22 16 8.7	13
1839 Apr. 13	13 18 1.12	+ 8 12 23.7	34
1840 Aug. 2	19 38 43.35	−31 15 29.4	15–16
1841 Oct. 26	1 23 32.81	− 5 50 54.2	28–26
1843 Feb. 5	8 18 38.23	+32 2 25.3	11
1844 May 17	15 59 4.89	−14 10 35.2	50–48
1845 Aug. 29	22 16 34.94	−26 38 14.5	30
1846 Nov. 19	3 47 36.12	+13 10 4.4	11
1848 Mar. 28	11 44 36.17	+19 59 47.3	26–22
1849 July 5	18 22 26.38	−28 11 45.6	25–23
1850 Sept. 18	0 37 56.44	−13 4 21.3	10
1852 Jan. 8	6 32 47.89	+29 9 31.1	13
1853 May 5	14 30 44.15	− 3 1 41.6	26–25
1854 Aug. 13	20 57 56.49	−30 15 24.5	25–28
1855 Nov. 4	2 30 18.54	+ 3 8 17.2	14–16
1857 Feb. 22	10 7 26.90	+28 27 6.2	55
1858 June 6	17 11 32.29	−22 2 35.3	30
1859 Sept. 1	23 31 59.71	−20 13 37.5	27
1860 Dec. 4	5 4 30.93	+21 15 0.0	18–17
1862 Apr. 21	13 5 28.44	+ 9 5 26.2	40–37
1863 July 16	19 48 49.23	−30 4 5.7	24
1864 Oct. 16	1 26 23.54	− 6 8 42.6	27–28
1866 Feb. 4	8 10 44.46	+32 5 59.1	19–21
1867 May 26	15 45 39.55	−13 43 22.6	28
1868 Aug. 27	22 12 40.98	−26 50 32.8	30–39
1869 Nov. 23	3 37 5.90	+12 35 19.5	15–16
1871 Mar. 19	11 43 0.10	+20 30 36.0	17
1872 June 30	18 20 11.97	−27 44 34.7	23–22
1873 Sept. 30	0 23 7.31	−14 34 29.6	27
1875 Jan. 5	6 25 8.51	+28 40 38.6	14
1876 May 6	14 21 47.04	− 2 2 46.2	23
1877 Aug. 17	20 48 16.32	−30 44 40.7	7
1878 Nov. 7	2 22 8.73	+ 2 25 48.7	11–10
1880 Feb. 28	9 53 47.79	+29 23 14.7	15
1881 June 16	16 54 4.83	−21 55 43.7	15–16
1882 Sept. 23	23 7 52.33	−22 28 41.0	8–7
1883 Dec. 4	4 58 28.24	+20 45 39.7	20–13
1885 Apr. 4	13 3 26.43	+ 9 53 57.6	23
1886 July 30	19 27 9.79	−31 2 52.7	8
1887 Oct. 22	1 16 15.76	− 7 4 20.9	15–14
1889 Feb. 4	8 0 40.55	+32 13 15.1	8
1890 May 27	15 35 47.70	−12 51 32.2	17–18
1891 Sept. 6	21 57 44.06	−27 52 42.0	11
1892 Nov. 18	3 33 18.75	+11 45 45.3	6
1894 Mar. 15	11 33 59.87	+21 29 40.2	20–21
1895 June 22	18 20 58.40	−27 0 17.7	15–14
1896 Sept. 26	0 20 25.27	−14 58 1.5	4–5
1897 Dec. 15	6 29 58.43	+27 2 21.4	9

ON PISTOR AND MARTINS'S PRISMATIC REFLECTING CIRCLE.

BY T. H. SAFFORD.

CHAUVENET'S excellent treatise on Spherical and Practical Astronomy seems to contain an oversight which probably accidentally arises from the method employed in the construction of the work, and should not be used as a cause for unfavorable criticism.

On page 92 of Volume II, he says, Section 78: "The sextant of all astronomical instruments is the most especially adapted to the purposes of the investigator and the scientific explorer."

This statement, for the better students who elect astronomy in their college course, seems to need modification as the "Handbuch der Nautischen Instrumente," published by the Hydrographical Bureau of the German Admiralty, as well as a similarly authorized "Handbuch der Navigation," contains a description of the PISTOR and MARTINS Prismatic Circle which shows the superiority of the later invented instruments both theoretically and practically, as I have tested by the use of the prismatic circle which Wil-

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: