

VARIATION OF LATITUDE AT THE TŌKYŌ
OBSERVATORY.

(2nd series).

Last year I published, in No. 1 of the publications of this Committee, the first series of observations of the variation of Latitude. This publication is a brief account of the 2nd series, in continuation of the 1st, which was begun on September 13, 1896, and terminated September 25, 1897. Complete reports of the two series will be given afterwards in the *Annales* of the Observatory. The observations would have been continued without a break, if I had not been obliged to give up the work for a time in order to join the expedition to observe the recent total solar eclipse in India.

The condition of the weather during the present series was less favourable than that during the first. Usually the weather is clear and dry in winter, but this year it was abnormally unfavourable, being misty and wet, and though the stars might be seen through the telescope, their images were diffused and ill-defined just as it frequently happens in summer weather. Such was the case in November and December 1896; and cloudiness prevailed throughout January 1897.

The observing station, instrument, and stars of all the groups being the same as those in the 1st series, I think there is no necessity to describe them again in detail. The reductions, however, were carried out without any dependence upon those of the former series, with the exception that the same constants as before were used for micrometer and for the levels. In both series the same group III was chosen as the origin of the declination system. In the 1st series only group III was observed for two years, making in all just only cycle; while in this series, the whole time being two months longer, two groups, III and IV, were re-observed. I have thus got the following two values for the cyclical sum of the differences, one starting from III and the other from IV :

Group III	−0."094
IV	−0."061
Mean	−0."078

Correcting these values by using Nyrèn's aberration-constant=20."495, they become

Group III	+0."041
IV	+0."075
<hr/>	
Mean	+0."058

The values of latitude given in the accompanying tables are the results corrected by using Nyrèn's aberration-constant ; I do not give also the direct result from Jahrbuch, for I have found in the 1st series, that the series (N) is a little better than (S), and that there is no material difference between them for the purpose in hand. The probable error of a single observation is $\pm 0."094$, being a little less than that obtained in the 1st series. This result was obtained from 856 residuals in finding the declination error of each single pair from its own group mean. Of the following tables, I gives the daily means of latitude ; II, 28 mean values taking nearly equal numbers of pairs ; III, monthly means ; and IV zigzag curves from II and III.

Lastly I must not omit to state my obligations to *Prof. H. Terao*, Director of the Observatory, for many conveniences during this work.

H. KIMURA.

Tōkyō Observatory,

May 1, 1898.

TABLE I.

DAILY MEANS.

Date.	Latitude.	No. of pairs.	Date.	Latitude.	No. of pairs.
1896 Sept. 13	35° 39' 16.65	9	1896 Dec. 3	35° 39' 16.87	3
18	16.77	12	5	16.78	8
19	<u>16.70</u>	16	6	16.79	15
21	16.69	16	7	16.63	1
27	16.63	12	9	<u>16.83</u>	16
Oct. 7	16.96	5	12	16.91	16
8	16.61	1	14	16.95	8
14	<u>16.76</u>	7	15	<u>16.90</u>	15
15	16.71	10	22	16.84	8
19	16.80	15	23	16.83	16
22	16.87	15	26	<u>16.95</u>	10
27	<u>16.85</u>	4	1897 Jan. 20	16.86	15
29	16.88	16	22	16.90	8
30	16.80	10	23	16.84	7
Nov. 1	<u>16.70</u>	16	26	17.04	3
3	16.93	16	28	<u>16.85</u>	12
4	16.80	4	Feb. 5	16.96	13
5	16.80	7	6	16.82	12
7	<u>16.85</u>	15	7	16.86	8
9	16.67	8	8	<u>16.92</u>	8
11	16.94	8	11	16.86	16
12	16.81	16	14	16.90	8
15	<u>16.90</u>	10	17	16.77	10
24	<u>16.84</u>	16	21	<u>16.83</u>	16
28	17.17	1	28	16.92	16
30	16.87	16	Mar. 2	16.84	16
Dec. 1	<u>16.91</u>	13	5	<u>16.86</u>	16

Date.	Latitude.	No. of pairs.	Date.	Latitude.	No. of pairs.
1897 Mar. 6	35° 39' 16.88	14	1897 June 11	35° 39' 16.44	13
10	16.79	9	16	16.50	4
11	16.82	8	18	16.50	16
18	16.83	6	20	<u>16.51</u>	15
24	<u>16.89</u>	8	July 3	16.47	3
25	16.93	2	4	16.38	1
29	16.83	16	5	16.50	15
31	<u>16.79</u>	24	11	16.40	10
Apr. 16	16.72	6	21	16.58	2
20	16.87	8	22	<u>16.37</u>	7
22	16.88	16	23	16.34	16
23	16.85	8	24	16.35	16
26	<u>16.78</u>	7	25	<u>16.37</u>	16
28	16.69	16	26	16.38	16
May 1	16.72	16	27	16.43	8
5	<u>16.61</u>	14	28	16.42	7
10	16.64	4	Aug. 4	<u>16.43</u>	8
12	16.63	5	9	16.34	9
14	16.63	16	18	16.41	14
16	16.71	11	19	16.43	16
20	16.56	2	20	<u>16.32</u>	6
22	<u>16.57</u>	5	23	16.47	1
25	16.57	15	24	16.38	7
26	16.55	14	Sept. 1	16.49	16
28	<u>16.55</u>	15	7	16.58	5
30	16.59	3	18	<u>16.57</u>	11
31	16.48	16	19	16.62	14
June 2	16.54	16	21	16.51	16
10	<u>16.61</u>	8	25	<u>16.53</u>	10

TABLE II.
MEAN VALUES.

	Date.		Year.	Latitude	No. of pairs.	No. of nights.
1896	Sept.	17	1896.71	35° 39' 16.71	37	3
	Oct.	3	.76	16.71	41	5
		21	.81	16.81	44	4
		30	.83	16.79	42	3
	Nov.	5	.85	16.87	42	4
		12	.87	16.83	42	4
		28	.91	16.88	46	4
	Dec.	6	.93	16.81	43	5
		14	.95	16.91	39	3
		24	.98	16.87	34	3
1897	Jan.	24	1897.07	16.87	45	5
	Feb.	7	.10	16.89	41	4
		16	.13	16.84	50	4
	Mar.	2	.17	16.87	48	3
		14	.20	16.85	45	5
		28	.24	16.81	42	3
	Apr.	21	.31	16.84	45	5
	May	1	.33	16.68	46	3
		16	.37	16.64	43	6
		26	.40	16.55	44	3
	June	3	.42	16.53	43	4
		16	.46	16.48	48	4
	July	11	.53	16.45	38	6
		24	.56	16.36	48	3
		29	.58	16.41	39	4
	Aug.	17	.63	16.39	45	4
	Sept.	2	.67	16.50	40	5
		22	.72	16.55	40	3

TABLE III.

MONTHLY MEANS.

	Date.		Year.	Latitude	No. of pairs.	No. of nights.
1896	Sept. 20		1896.72	35° 39' 16.69"	65	5
	Oct. 19		.80	16.82	83	9
	Nov. 12		.87	16.83	133	12
	Dec. 12		.95	16.87	129	12
1897	Jan. 24		1897.07	16.87	45	5
	Feb. 13		.12	16.87	107	9
	Mar. 16		.21	16.84	119	10
	Apr. 23		.31	16.80	61	6
	May 19		.38	16.60	136	13
	June 13		.45	16.51	72	6
	July 18		.55	16.40	117	12
	Aug. 17		.63	16.39	61	7
	Sept. 15		.71	16.54	72	6
					1200	112

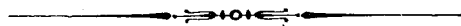
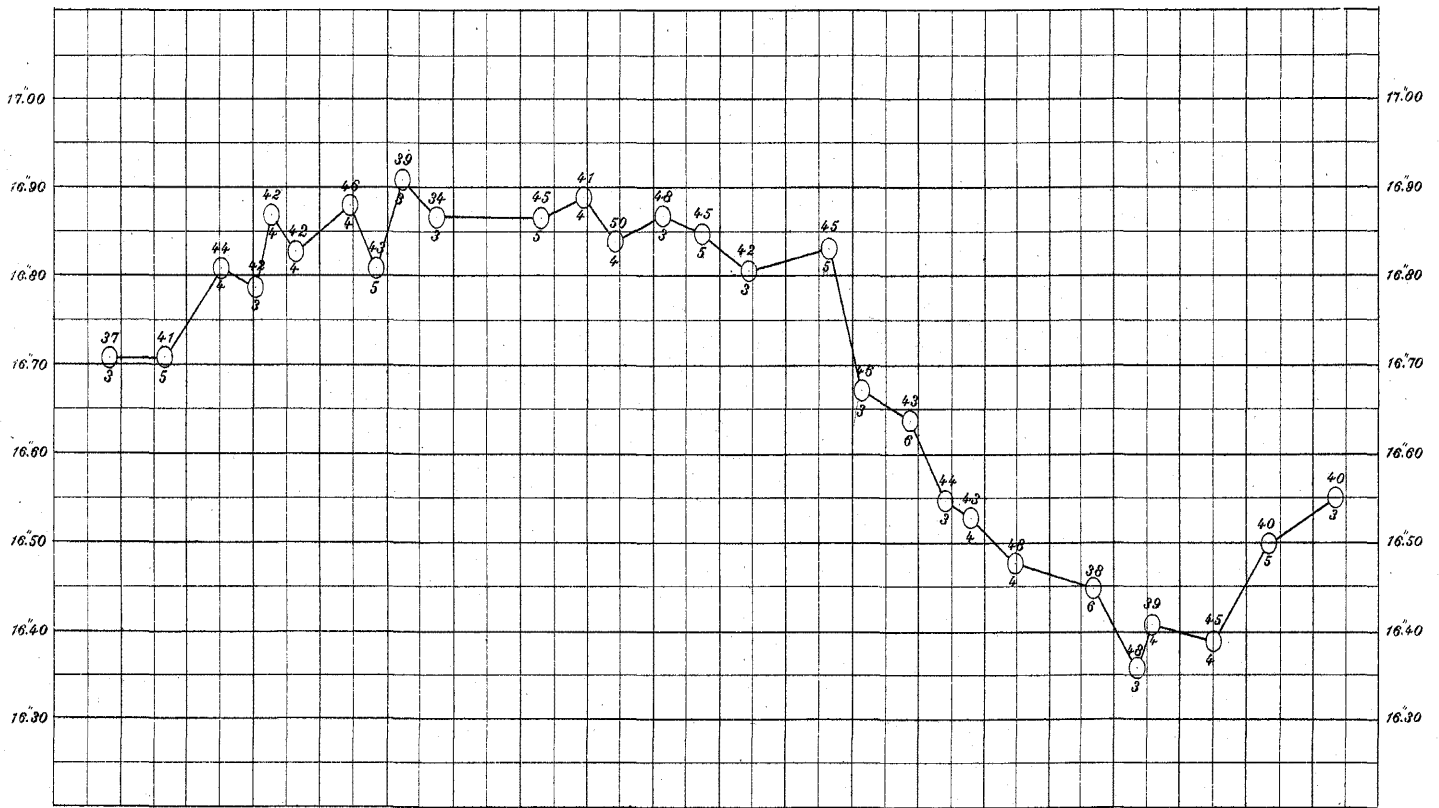
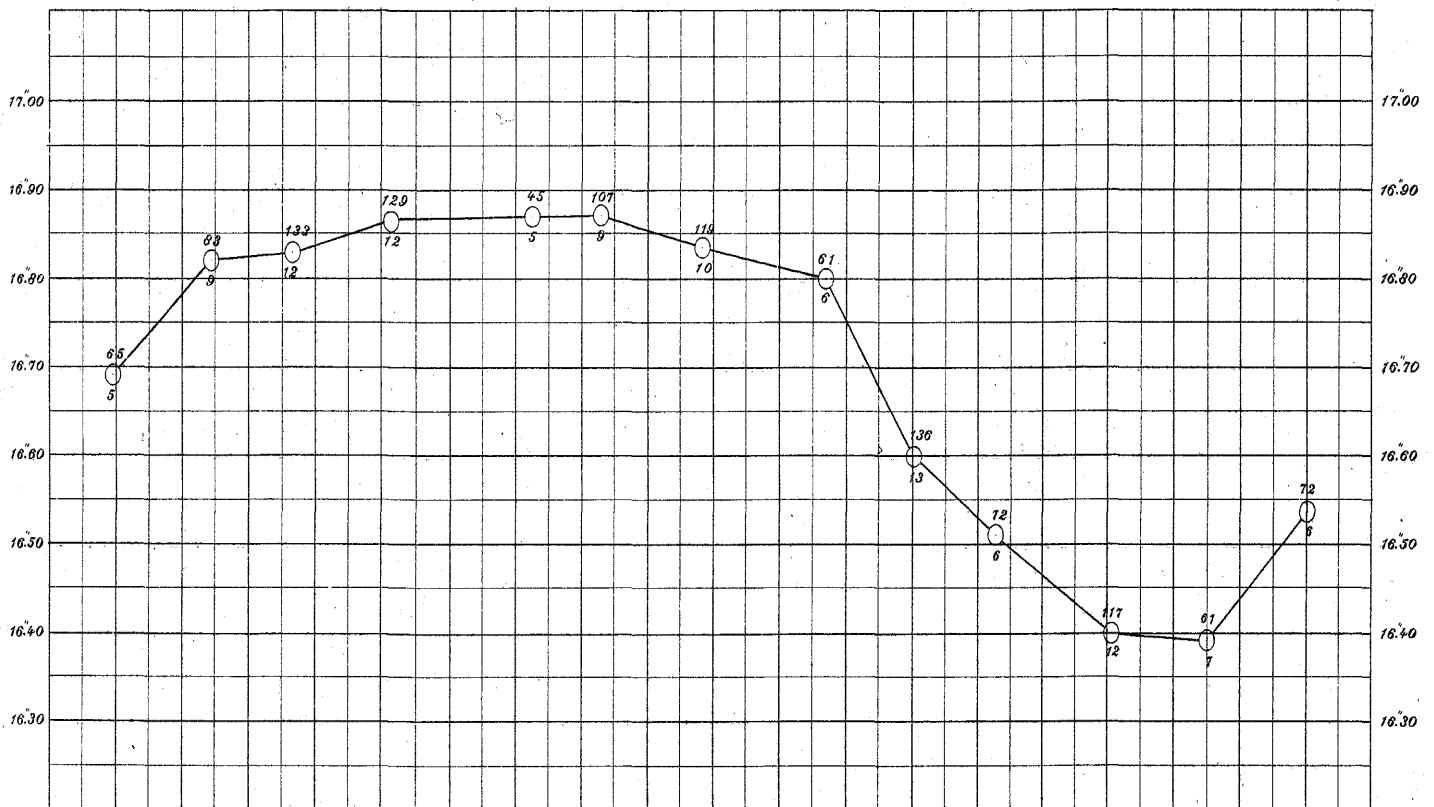


TABLE IV.



1899 Sept. Oct. Nov. Dec. 1899 Jan. Feb. Mar. Apr. May. June July Aug. Sept. Oct.
 0 10 20 30 10 20 30 9 19 29 9 19 29 8 18 28 7 17 27 9 19 29 8 18 28 8 18 28 7 17 27 7 17 27 6 16 26 5 15 25 5



The upper numbers denote the number of pairs.
 The lower numbers denote the number of nights.