RESULTS OF MAGNETIC OBSERVATIONS MADE BY THE UNITED STATES COAST AND GEODETIC SURVEY AT THE TIME OF THE TOTAL SOLAR ECLIPSE OF AUGUST 30, 1905.

By O. H. Tittmann, *Superintendent*.

In response to the request for co-operation issued by the Director of the Department of Research in Terrestrial Magnetism of the Carnegie Institution of Washington, arrangements were made by the Coast and Geodetic Survey for special declination observations at the time of the total solar eclipse of August 30, 1905, at the five magnetic observatories of the Bureau and by the various magnetic observers engaged in field work. In accordance with the instructions issued, eye-readings of the declination were made every minute from 5^h to 11^h a. m., 75th meridian mean time, and the temperature was read every fifteen minutes. The observers in charge of the various observatories were also instructed to take special care to have the self-recording instruments in good adjustment. In addition, at Cheltenham, the Eschenhagen magnetograph was run on the "two hour" rate from 4^h 30^m to 6^h 30^m a. m.

The geographic positions of the places where observations were made and the approximate values of the magnetic elements are given in the following table:

Station	State	Latitude North	Longitude West of Greenw.	Approximate Magnetic Elements: Declination	Inclination	Hor'l Inten'y (C.G.S.)	Remarks
		° ′	° ′	° ′	° ′		
Vieques	Porto Rico	18 09	65 26	1 26 W	49 42	.2898	Observatory
Colebrook	New Hampshire	44 53	71 31	16 00 W	75 15	.1563	Field Sta.
Cheltenham	Maryland	38 44	76 50	5 18 W	70 26	.2007	Observatory
Wausau	Wisconsin	44 57	89 38	5 59 E	75 22	.1618	Field Sta.
Baldwin	Kansas	38 47	95 10	8 28 E	68 43	.2184	Observatory
Pembina	North Dakota	48 58	97 15	11 29 E	77 17	.1395	Field Sta.
Sitka	Alaska	57 03	135 20	30 00 E	74 43	.1548	Observatory
Honolulu	Territory Hawaii	21 19	158 04	9 21 E	40 05	.2922	Observatory

More detailed information is given in the following paragraphs:

Vieques, Porto Rico. — J. W. Green, observer-in-charge. The eye-readings were made in the absolute observatory, a small wooden building about half way up the hill to the east of old Fort Isabel, using a Cooke magnetometer, the regular observatory absolute instrument. One division of the scale = 1′.38. The magnetograph was mounted in a room of the old fort. It had been remounted on June 1st, and had not reached a stable condition at the time of the eclipse observations.

The magnetograph is of the Eschenhagen type. One millimeter on the trace equalled 1′.0 in declination, 2.0 γ in H (horizontal intensity) and 4.0 γ in Z (vertical intensity). The temperature coefficients have not yet been computed. Although there was no special insulation of the magnetograph room, the thick stone walls of the fort kept the diurnal range of temperature down to about 1°.0 Centigrade, and the change during the period of discussion was only 0.′2.

Colebrook, New Hampshire.—G. B. PEGRAM, observer. Observations were made in a tent, which was set up on top of a small hill, consisting of a bed rock of calcareous mica schist, thinly overlaid with sandy soil. The instrument used was a Cooke magnetometer; one division of scale = 1.′38. Magnetic disturbance was noticed during observations made on the 29th and 31st.

Cheltenham, Maryland. — W. F. WALLIS. observer-in-charge. The eye-readings were made in the west wing of the absolute observatory by S. G. Townshend, Jr., using an old style (Weber model) magnetometer. One division of scale of declination magnet = 2.′32. The magnetograph from which the accompanying results were obtained is of the Eschenhagen type. One millimeter on the trace corresponded to 1.′0 in D, 1.67 γ in H, and 1.5 γ in Z. The diurnal variation in temperature was so nearly zero that it was not necessary to apply any correction for change of temperature.

Wausau, Wisconsin.—C. C. CRAFT, observer. The observations were made in a tent, with a magnetometer of Coast and Geodetic Survey type. One division of scale of declination magnet = 2.′01. Owing to the difficulty of setting up the instrument in the dark, the observations did not begin until $5^h\ 20^m$.

Baldwin, Kansas. — W. B. KEELING, observer-in-charge. The eye-readings were made in the absolute observatory, using a Cooke magnetometer, the regular observatory instrument. One division of scale = 1.′37. The magnetograph was of the Eschenhagen type, mounted in a partly underground room. One millimeter on the trace corresponded to 1.′0 in D, 3.18 γ in H, and 3.5 γ in Z. The temperature coefficient of the H variometer is 4.5 γ per degree Centigrade. That for Z has not been computed. As there is no especial provision for insulation, the diurnal range of temperature in the magnetograph room amounts to 2° or 3°, and sometimes more, but for the period under discussion the change was only about 0.°4.

Pembina, North Dakota.—H. W. FISK, observer. Observations were made in a tent, with a magnetometer of the Coast and Geodetic Survey type. One division of scale of declination magnet = 2.′00. During the entire morning the "Northern Lights" were unusually brilliant and active, and the regular observations, on the 29th, showed magnetic disturbance.

Sitka, Alaska.—DR. H. M. W. EDMONDS, observer-in-charge. Observations were made in the absolute observatory, using the regular observatory instrument, an Eschenhagen-Tesdorpf magnetometer. This instrument has no scale, so the horizontal circle had to be read for each setting on the magnet. Diffuse auroras were seen for several nights previous to the 30th, deep, dull red in the north and fading out to the south. There were auroral streamers on the evening of August 29th, and minor displays on the morning of the 30th. [The magnetograph results are not at present available for publication.]

Honolulu, Territory Hawaii.—S. A. DEEL, observer-in-charge. Observations were made in the absolute observatory with the regular observatory magnetometer, a Wild-Edelmann combination instrument, designed for field use. One division of scale = 1.′99. The magnetograph is of the Eschenhagen type. One millimeter on the trace corresponded to 1.′0 in D, 2.56 γ in H, and 2.70 γ in Z. The diurnal range in temperature in the magnetograph room was so near zero that no correction for change in temperature was required for these observations.

TABLES OF RESULTS.

In Table I are given the five-minute means of the results of the declination eye-readings for the various stations, together with the values for the corresponding times derived from the photographic traces at the magnetic observatories. A five-minute mean is the mean of five readings, arranged symmetrically with reference to the tabular minute. [For the observatories, both the eye (I) readings and the magnetograph trace (T) readings are given.]

Table II contains the corresponding values of horizontal and vertical intensity derived from the photographic traces. The variations in temperature were so small during the period in question that no correction for temperature was made.

Table III gives approximately the normal diurnal variation in D, H, and Z, at the magnetic observatories for the end of August, 1905, derived from the monthly tabulations for August and September. In order that this table might be directly comparable with the one preceding it, the H and Z results have not been corrected for temperature change. The times in this table are local mean hours, counting from midnight to midnight.

Table IV shows the variation in temperature during the eye-readings at the various stations.

The photographic traces from the observatories show a considerable magnetic disturbance from the 29th to the 31st of August, and it was noticed during the special observations by most of the observers.

TABLE I

Results of magnetic declination observations made on August 30, 1905, between 5^h and 11^h a. m., 75th meridian mean time.

75th Mer. Mean Time (a. m.)	(1) Vieques, P. R. (I) 1° West plus	(2) Vieques, P. R. (T) 1° West plus	(3) Colebrook, N. H. 15° West plus	(4) Cheltenham, Md. (I) 5° West plus	(5) Cheltenham, Md. (T) 5° West plus	(6) Wausau, Wis. 5° East plus	(7) Baldwin, Kan. (I) 8° East plus	(8) Baldwin, Kan. (T) 8° East plus	(9) Pembina, N. D. 10° East plus	(10) Sitka, Alaska (I) 29° East plus	(11) Honolulu, T. H. (I) 9° East plus	(12) Honolulu, T. H. (T) 9° East plus
h m	′	′	′	′	′	′	′	′	′	′	′	′
5 00	25.3	25.5	56.6	14.7	15.8	. .	. . .	29.6	. .	61.7	21.8	21.8
05	25.0	25.3	55.3	14.0	15.0	. .	. . .	30.2	90.6	62.1	21.7	21.7
10	24.9	25.0	54.9	13.8	14.7	. .	. . .	30.2	90.3	62.6	21.7	21.7
15	24.7	24.7	54.0	13.4	14.4	. .	30.2	30.4	89.9	63.9	21.9	21.8
20	24.5	24.4	54.0	13.1	13.9	63.6	30.4	30.5	89.5	64.2	22.1	22.0
25	24.9	24.5	55.5	13.6	14.6	61.6	29.0	29.3	85.9	63.1	22.1	22.1
30	25.0	24.6	56.2	14.1	14.8	59.8	27.8	28.0	82.0	59.2	22.1	22.1
35	25.1	24.7	56.5	14.5	15.3	58.3	26.8	26.8	79.2	56.8	22.2	22.2
40	25.5	25.1	59.0	15.7	16.5	55.5	25.3	25.4	74.2	53.8	22.3	22.4
45	25.5	25.4	62.4	17.7	18.5	50.8	23.0	23.0	66.9	49.9	22.3	22.5
50	25.3	25.3	65.4	19.4	20.3	45.7	20.7	20.5	60.7	48.3	22.3	22.5
55	25.2	25.3	66.3	20.3	21.0	43.9	19.8	19.9	59.3	61.0	22.3	22.3
6 00	25.3	25.3	66.8	20.5	21.1	44.8	20.3	20.3	62.3	66.1	22.1	22.2
05	25.2	25.2	65.4	19.5	20.3	47.2	21.6	21.3	66.9	63.8	22.0	21.9
10	24.7	24.6	65.6	19.0	19.9	48.5	22.3	22.0	67.4	55.7	21.8	21.7
15	24.1	24.2	63.8	17.9	18.5	50.6	23.4	23.4	69.6	50.7	21.6	21.6
20	23.5	23.5	62.6	17.0	17.6	52.0	24.4	24.2	71.4	50.0	21.2	21.3
25	23.1	22.9	60.4	16.0	16.5	53.0	24.8	24.6	72.4	50.6	21.0	21.3
6 30	23.1	23.1	61.7	16.0	17.0	53.6	25.3	25.3	76.1	52.4	21.0	21.0
35	23.0	22.9	60.1	15.4	16.3	54.8	26.0	26.0	74.5	55.9	21.1	21.1
40	23.1	23.0	60.9	15.4	16.5	54.6	26.1	26.0	75.8	54.8	21.2	21.2
45	22.7	22.5	62.2	15.4	16.0	54.8	26.2	26.1	75.2	54.8	21.4	21.3
50	22.7	22.6	60.6	14.5	15.3	56.8	27.3	27.2	78.9	53.9	21.5	21.5
55	22.2	22.1	59.2	13.2	13.5	58.2	28.0	28.0	80.6	54.6	21.5	21.5
7 00	22.3	22.2	57.8	13.4	14.2	58.7	28.6	28.4	82.2	56.7	21.7	21.6
05	22.2	22.3	56.4	12.6	13.4	59.6	29.1	28.9	83.4	57.4	21.9	21.7
10	22.0	21.9	54.6	11.7	12.4	61.1	29.8	29.6	85.9	57.9	21.8	21.7
15	21.9	21.7	53.4	10.8	11.2	62.3	30.4	30.4	87.2	59.3	21.8	21.7
20	21.0	21.5	51.1	9.5	10.6	64.0	31.2	30.9	87.7	60.2	21.8	21.8
25	21.7	21.5	53.2	10.1	10.4	64.0	31.5	31.4	89.2	52.0	21.9	21.8
30	21.5	21.4	53.3	9.7	10.4	64.8	32.0	31.9	88.9	62.4	21.8	21.8
35	21.2	21.1	51.0	8.4	9.3	67.0	33.1	33.1	91.6	61.8	21.8	21.7
40	21.2	21.0	51.8	8.5	8.2	66.7	33.2	33.4	92.5	63.0	21.7	21.7
45	21.4	21.0	52.1	8.8	9.6	66.3	33.2	33.0	91.8	62.7	21.8	21.9
50	21.6	21.5	54.3	9.3	9.9	67.2	33.6	33.3	93.3	63.2	22.0	22.0
55	21.5	21.4	53.8	8.8	8.4	66.4	33.4	33.5	91.3	62.5	22.0	22.0

TABLE I—Continued.

75th Mer. Mean Time (a. m.)	(1) Vieques, P. R. (I) 1° West plus	(2) Vieques, P. R. (T) 1° West plus	(3) Colebrook, N. H. 15° West plus	(4) Cheltenham, Md (I) 5° West plus	(5) Cheltenham, Md. (T) 5° West plus	(6) Wausau, Wis. 8° East plus	(7) Baldwin, Kan. (I) 8° East plus	(8) Baldwin, Kan (T) 8° East plus	(9) Pembina, N. D. 10° East plus	(10) Sitka, Alaska (I) 29° East plus	(11) Honolulu, T. H. (I) 9° East plus	(12) Honolulu, T. H. (T) 9° East plus
h m	′	′	′	′	′	′	′	′	′	′	′	′
8 00	21.8	21.7	55.0	9.6	9.6	66.7	33.6	33.4	92.6	62.4	22.1	22.2
05	21.5	21.4	53.1	8.5	9.3	67.3	34.0	33.6	92.1	60.6	21.9	22.0
10	21.4	21.4	51.2	7.6	7.7	68.9	35.0	35.0	93.8	59.6	21.8	21.7
15	21.4	21.3	51.1	7.3	7.3	70.0	35.7	35.6	95.4	58.7	21.7	21.7
20	21.8	21.5	54.6	8.6	8.8	68.3	34.9	34.4	93.9	59.2	21.7	21.8
25	22.0	21.9	55.6	9.4	9.0	67.1	34.8	34.5	93.9	59.1	21.8	21.7
30	22.3	22.3	56.9	10.0	10.4	66.5	34.6	34.6	94.2	60.8	21.9	21.7
35	22.7	22.5	57.5	10.2	10.4	67.5	34.8	35.0	95.2	60.7	21.9	21.7
40	22.9	22.9	57.9	10.4	10.7	68.1	35.0	35.0	95.4	61.5	21.7	21.6
45	23.1	23.1	58.1	10.6	11.0	68.0	35.1	35.0	95.2	61.4	21.7	21.6
50	23.3	23.3	57.2	10.4	11.0	68.8	35.3	34.7	95.0	60.1	21.6	21.6
55	23.4	23.5	57.4	10.8	11.2	68.2	35.2	35.0	95.0	60.1	21.7	21.5
9 00	23.6	23.5	58.5	10.9	11.0	67.8	35.2	34.5	94.8	58.7	21.7	21.6
05	23.7	23.7	56.8	10.8	11.0	68.6	35.6	35.5	95.4	58.2	21.7	21.6
10	23.8	23.7	57.7	11.0	10.7	68.1	35.5	35.5	94.8	58.6	21.8	21.7
15	24.0	23.8	57.3	11.1	11.4	67.8	35.2	34.6	94.0	58.6	21.8	21.7
20	24.1	24.0	56.9	10.9	10.8	66.6	35.7	35.5	94.8	59.3	21.7	21.7
25	24.3	24.3	57.9	11.4	11.3	68.3	35.6	35.5	95.0	60.9	21.8	21.7

75th Mer. Mean Time (a. m.)	(1) Vieques, P. R. (I) 1° West plus	(2) Vieques, P. R. (T) 1° West plus	(3) Colebrook, N. H. 15° West plus	(4) Cheltenham, Md. (I) 5° West plus	(5) Cheltenham, Md. (T) 5° West plus	(6) Wausau, Wis. 8° East plus	(7) Baldwin, Kan. (I) 8° East plus	(8) Baldwin, Kan. (T) 8° East plus	(9) Pembina, N. D. 10° East plus	(10) Sitka, Alaska (I) 29° East plus	(11) Honolulu, T. H. (I) 9° East plus	(12) Honolulu, T. H. (T) 9° East plus
h m	′	′	′	′	′	′	′	′	′	′	′	′
9 30	24.6	24.4	59.2	12.1	12.1	67.2	34.9	35.1	94.6	62.3	22.0	21.8
35	24.9	24.6	59.6	12.6	12.6	66.8	34.5	34.6	94.3	62.5	22.1	22.1
40	25.1	25.0	60.6	13.2	13.0	65.7	34.2	34.2	93.2	64.2	22.3	22.3
45	25.4	25.3	61.9	14.0	14.0	64.7	33.3	33.7	92.3	65.1	22.4	22.5
50	25.5	25.4	62.6	14.6	14.8	63.5	32.8	32.5	90.3	65.2	22.6	22.5
55	25.7	25.5	62.4	14.6	15.1	63.9	33.1	33.2	91.2	65.4	22.6	22.5
10 00	25.8	25.6	62.9	14.6	15.0	64.5	33.3	33.4	91.7	65.7	22.5	22.5
05	25.8	25.6	62.4	14.2	14.6	65.6	33.8	33.4	93.0	64.7	22.5	22.5
10	25.8	25.5	62.2	14.3	14.2	66.2	34.4	34.9	94.5	64.0	22.4	22.5
15	26.2	25.9	63.1	15.0	15.0	65.5	34.0	34.4	94.3	65.0	22.5	22.5
20	26.4	26.1	63.5	15.4	15.5	64.5	33.4	33.4	93.3	65.7	22.5	22.5
25	26.5	26.4	64.2	15.9	16.2	63.5	33.0	32.8	92.5	66.3	22.6	22.5
30	26.8	26.5	64.8	16.1	16.4	63.8	32.9	33.0	92.2	67.7	22.7	22.7
35	27.0	26.9	65.1	16.5	16.8	63.6	32.8	33.0	92.4	68.2	22.8	22.7
40	27.2	27.1	66.2	17.1	16.8	62.3	32.0	32.4	91.4	68.9	23.0	22.8
45	27.4	27.1	66.7	17.4	17.5	60.9	31.6	32.0	90.2	68.3	23.1	22.9
50	27.6	27.3	67.5	18.0	18.2	60.2	30.7	31.0	88.3	68.2	23.1	23.0
55	27.6	27.4	66.5	17.6	17.9	61.2	31.2	31.2	89.0	68.1	23.0	23.1
11 00	27.6	27.5	64.7	16.9	17.4	62.0	. .	31.6	89.3	69.2	23.0	22.9

Table II

Values of horizontal intensity and vertical intensity on August 30, 1905, between 5^h and 11^h a. m., 75th meridian mean time.

Horizontal Intensity

75th Mer. Mean Time (a. m.)	Vieques, P. R. 28900 γ plus	Cheltenham, Md. 20000 γ plus	Baldwin, Kan. 21700 γ plus	Honolulu, T. H. 29100 γ plus
h m	γ	γ	γ	γ
5 00	63	76	138	97
05	64	78	139	97
10	64	79	138	95
15	64	77	136	93
20	64	75	134	93
25	64	71	133	95
30	65	68	132	100
35	64	65	128	102
40	65	63	130	105
45	65	59	133	110
50	64	55	139	115
55	64	54	140	119
6 00	64	52	137	120
05	61	51	131	118
10	59	51	131	120
15	57	49	129	120
20	55	49	129	120
25	54	50	129	119
30	55	54	132	118
35	55	53	131	115
40	56	53	135	116
45	56	54	143	118
50	54	55	137	116
55	54	54	133	115
7 00	54	53	137	112
05	54	52	134	111
10	52	54	133	110
15	52	52	132	108
20	52	46	130	107
25	52	56	136	107
30	50	49	131	107
35	49	45	128	105
40	51	49	132	105
45	50	43	128	105
50	50	51	132	104
55	50	44	131	104

Vertical Intensity

75th Mer. Mean Time (a. m.)	Vieques, P. R. 34100 γ plus	Cheltenham, Md. 56400 γ plus	Baldwin, Kan. 56000 γ plus	Honolulu, T. H. 24600 γ plus
h m	γ	γ	γ	γ
5 00	98	32	42	3
05	98	32	42	3
10	99	33	42	2
15	100	33	43	3
20	99	33	44	4
25	100	33	42	6
30	101	33	41	6
35	101	33	41	6
40	104	34	40	6
45	104	34	39	7
50	104	34	38	8
55	102	34	37	6
6 00	102	34	37	6
05	101	34	38	4
10	98	34	39	4
15	94	33	41	4
20	89	33	42	3
25	87	34	43	2
30	89	34	44	1
35	89	34	46	1
40	90	34	47	3
45	89	34	47	4
50	89	34	49	3
55	86	35	50	3
7 00	88	36	52	4
05	88	36	52	4
10	87	37	53	4
15	86	37	56	4
20	86	38	58	4
25	88	39	58	6
30	85	38	58	5
35	82	38	61	5
40	85	38	62	5
45	86	37	61	6
50	88	37	61	5
55	85	36	62	6

Horizontal Intensity

75th Mer. Mean Time (a. m.)	Vieques, P. R. 28900 γ plus	Cheltenham, Md. 20000 γ plus	Baldwin, Kan. 21700 γ plus	Honolulu, T. H. 29100 γ plus
h m	γ	γ	γ	γ
8 00	50	44	133	105
05	50	38	128	105
10	51	36	125	105
15	52	33	122	105
20	52	32	127	105
25	52	34	126	105
30	52	36	125	106
35	51	36	124	106
40	50	34	122	106
45	50	30	120	106
50	49	21	115	106
55	49	20	112	108
9 00	48	23	112	108
05	50	17	109	108
10	50	16	107	108
15	49	09	105	110
20	50	08	100	110
25	51	08	101	110
30	51	11	104	109
35	51	13	104	108
40	50	12	107	108
45	50	18	107	107
50	49	11	106	108
55	50	11	103	107
10 00	51	13	100	106
05	53	10	100	107
10	54	09	93	108
15	55	10	96	106
20	54	13	95	106
25	55	17	99	106
30	56	13	94	105
35	57	11	92	105
40	56	07	89	105
45	56	05	86	106
50	56	07	87	107
55	58	08	87	107
11 00	58	02	80	105

Vertical Intensity

75th Mer. Mean Time (a. m.)	Vieques, P. R. 34100 γ plus	Cheltenham, Md. 56400 γ plus	Baldwin, Kan. 56000 γ plus	Honolulu, T. H. 24600 γ plus
h m	γ	γ	γ	γ
8 00	88	36	61	5
05	86	35	62	6
10	86	35	63	5
15	86	34	64	4
20	89	34	63	5
25	88	33	62	5
30	90	33	63	5
35	91	33	63	5
40	92	34	62	5
45	91	34	62	5
50	90	34	63	5
55	91	34	63	5
9 00	90	35	63	5
05	90	35	63	6
10	90	34	63	6
15	90	34	63	6
20	90	33	62	6
25	90	33	62	5
30	92	32	62	6
35	92	32	62	6
40	94	32	61	6
45	94	33	61	6
50	93	33	59	7
55	93	33	59	6
10 00	94	32	58	7
05	94	31	58	7
10	94	30	58	7
15	95	29	57	6
20	96	29	56	6
25	96	30	56	6
30	97	29	56	7
35	97	30	55	7
40	96	29	53	7
45	95	29	53	8
50	93	29	52	8
55	93	28	52	8
11 00	92	28	50	7

TABLE III

Normal diurnal variation of the magnetic declination, horizontal intensity and vertical intensity for the end of August, 1905.

[A plus sign indicates that the magnet was to the east of its mean position for the day, or that the force was less than its mean value.]

Local Mean Time	Declination				Horizontal Intensity				Vertical Intensity			
	Porto Rico	Cheltenham	Baldwin	Honolulu	Porto Rico	Cheltenham	Baldwin	Honolulu	Porto Rico	Cheltenham	Baldwin	Honolulu
h	′	′	′	′	γ	γ	γ	γ	γ	γ	γ	γ
1	−0.2	+0.3	+0.3	−0.2	+1	−6	−10	+2	+1	+1	−2	−1
2	−0.2	+0.3	+0.2	−0.1	0	−6	−12	+1	−1	+3	−4	−2
3	0.0	+0.3	+0.4	+0.1	−3	−6	−10	+1	−3	+4	−5	−3
4	+0.2	+1.1	+0.6	+0.4	−5	−7	−11	+1	−3	+3	−6	−4
5	+0.7	+1.9	+1.0	+0.7	−3	−7	−11	0	−3	+2	−8	−4
6	+2.0	+3.7	+2.5	+2.3	−4	−6	−12	−2	−3	−1	−12	−11
7	+4.2	+5.5	+4.9	+4.4	−2	+3	+2	0	+4	−1	−12	−14
8	+4.2	+6.1	+5.3	+4.5	−2	+18	+15	+1	+6	+1	−7	−9
9	+2.6	+4.2	+3.7	+2.8	−5	+32	+24	−1	+4	+5	+5	00
10	+1.0	+0.5	0.0	+0.3	−9	+36	+26	−3	+2	+8	+14	+10
11	−0.5	−3.1	−2.6	−1.9	−8	+28	+19	−5	0	+10	+17	+15
12	−1.7	−5.3	−3.9	−3.2	−8	+14	+11	−7	−1	+7	+17	+17
13	−2.3	−6.1	−5.1	−3.3	−5	0	+2	−8	−2	+3	+13	+13
14	−2.4	−5.3	−4.7	−2.5	−1	−10	−5	−7	−3	−2	+9	+7
15	−2.0	−3.5	−3.7	−1.4	+4	−14	−6	−5	−2	−6	+2	+3
16	−1.3	−1.7	−2.0	−0.6	+6	−14	−1	−3	0	−8	0	+1
17	−0.8	−0.3	−0.7	−0.4	+8	−9	0	+1	+2	−8	0	+1
18	−0.8	+0.3	0.0	−0.6	+7	−6	0	+5	+2	−7	+1	+2
19	−0.8	+0.1	+0.3	−0.4	+7	−6	−1	+5	+1	−5	−1	−1
20	−0.8	+0.3	+0.5	−0.2	+6	−6	−2	+5	+1	−4	−2	−2
21	−0.6	+0.5	+0.7	−0.1	+6	−8	−4	+6	+1	−3	−4	−3
22	−0.4	+0.4	+0.6	−0.2	+4	−8	−4	+5	0	−2	−4	−4
23	−0.4	+0.5	+0.5	−0.2	+2	−8	−5	+5	−1	0	−5	−4
24	−0.3	+0.3	+0.4	−0.3	+3	−6	−6	+3	0	+1	−6	−5

TABLE IV

Temperature readings during special declination eye-readings.

75th Mer. Mean Time	Vieques	Cole-brook	Chelten-ham	Wausau	Baldwin	Pembina	Sitka	Honolulu
h m	°	°	°	°	°	°	°	°
5 00	26.4	13.0	22.5	. .	23.5	. .	16.8	26.7
15	26.2	14.0	22.4	18.5	23.9	9.2	17.0	26.6
30	26.1	14.0	22.3	18.4	24.3	9.2	17 4	26.9
45	26.1	14.5	22.4	18.1	24.4	9.8	17.4	27.2
6 00	26.0	14.2	22.4	17.9	24.4	10.0	17.6	27.2
15	26.1	13.4	22.4	17.0	24.5	10.5	17.6	27.3
30	26.3	13.4	22.4	17.0	24.5	10.0	17 9	27.3
45	26.6	13.0	22.4	17.0	24.5	9.8	17.8	27.3
7 00	27 1	13.1	22.2	17.0	24 6	. .	17.9	27.3
15	27.5	13 4	22.2	17.1	24.5	9.5	18.0	27.3
30	27.9	13.5	22.4	17.0	24.5	10.3	18.0	27.3
45	28.1	14.3	22.4	17.1	24.5	10.7	18.1	27.2
8 00	28.6	14.6	22.5	18.1	24.9	11.3	18.2	27.2
15	29.0	14 6	22.9	17.2	25.2	11.9	18.2	27.2
30	29.0	14.8	23.0	18.0	25.4	12.5	18.3	27.2
45	29.0	14.6	23.1	17.1	25.7	12.8	18.2	27.2
9 00	28.9	15 0	23.2	17.8	25.4	12.8	18.1	27.2
15	29.0	15.0	23 6	18.1	25.4	13.8	17.9	27.1
30	28.9	14.7	23.8	18.0	25.7	13.8	17.7	27.1
45	29.0	14.6	24.0	19.0	26.0	14.0	17.6	27.1
10 00	29.4	15.4	24.1	19.3	26.6	14.6	17.7	27.1
15	30.0	15.2	24 8	19.9	27.1	15.0	18.1	27.0
30	30.1	15.0	25.0	20.1	27 9	15.8	18.2	27.0
45	30.5	15.0	25.3	20.8	28.4	15.4	18.0	26.9
11 00	30.8	14.9	25.9	21.9	29.0	15 2	18.2	26.8