

Compliments of the Author.

Gegenschein Observations.

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GEGENSCHIN OBSERVATIONS

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Since the beginning of last month the following observations have been made on the Gegenschein and accompanying phenomena. The positions given below are from Heis' Zodiacal Atlas (epoch 1855). Each observation is accompanied by a record of the locality in which it was made and the approximate elevation of that locality above the sea. The numbers inserted in parenthesis immediately after, refer to the stations used in the examination of sites suggested for the Lowell Observatory. Observations without such numbers were made either at the railway station, hotel, or house of residence. Positions given invariably refer to the point of greatest brightness. A few abbreviations of obvious meaning are used.

1. March 5. Halstead, Kan. 1460 ft. 14^h 52^m G. M. T. R. A. 171°.0, Dec. + 2°.0, Diam. Nuc. 3°.5. Round, then fading gradually in all directions. Have never seen it at Blue Hill as easily as this. (Harvard Observatory observations, September-November, 1893).

2. March 6. Las Vegas, N. M. 6400 ft. 15^h 12^m G. M. T. R. A. 170°.4, Dec. + 3°.6, Diam. Nuc. 2°.5. Easily visible 6° from brightest point. Very easily seen for this time of evening.

3. March 6. Blanchard, N. M. 7070 ft. 16^h 32^m G. M. T. R. A. 168°.8, Dec. + 4°.3. Can stand on rear of moving train and easily observe Gegenschein. It is as bright as was usual in Arequipa (Harvard Observatory Observations, 1891-1893).

4. March 7. Benson, A. T. 3600 ft. 16^h 02^m G. M. T. R. A. 171°.2, Dec. + 2°.7, Diam. Nuc. 2°.5, outer Diam. roughly 12°, probably elongated E. and W.

5. March 8. Tombstone, A. T. 4700 ft. 17^h 40^m G. M. T. R. A. 172°.8, Dec. + 5°.2, Diam. Nuc. 3°.7, outside Diam. N. and S. 10°, E. and W. 14°. Not so easily seen as last night.

6. March 9. Tombstone, A. T. 5070 ft. 17^h 44^m G. M. T. R. A. 172°.4, Dec. + 4°.5, Diam. 8°.0, elongated E. and W.

7. March 10. Tombstone, A. T. 4930 ft. 18^h 25^m G. M. T. Can see the same bright region east of Regulus (referring to region approximately R. A. 171° Dec. + 4°) but if that is not the Gegenschein I can't tell where it is. Can trace zodiacal band across sky but not very easily. If 10 is the brightest I have ever seen it, its brightness now is 5.

8. March 11. Tucson, A. T. 2400 ft. 17^h 30^m G. M. T.

Same bright region shows east of Regulus (approximately R. A. 171° , Dec. $+4^{\circ}$). Zodiacal band across sky shows 6 on scale of 10, passing near Præsepe, between α and η Leonis Majoris, and to Saturn.

9. March 22. Tempe, A. T. (7). 1400 ft. $14^{\text{h}} 55^{\text{m}}$ G. M. T. Observed zodiacal band from W. horizon to Leo Major but quite faint E. of Milky Way.

10. March 26. Phoenix, A. T. 1100 ft. $18^{\text{h}} 20^{\text{m}}$ G. M. T. R. A. $187^{\circ}.2$, Dec. $-5^{\circ}.1$, Diam. $3^{\circ}.2$. Gegenschein twice as bright as area so often observed recently.

11. March 29. Prescott, A. T. 5400 ft. $17^{\text{h}} 35^{\text{m}}$ G. M. T. R. A. $193^{\circ}.0$, Dec. $-3^{\circ}.6$, Diam. $4^{\circ}.6$.

12. March 31. Prescott, A. T. (9). 5700 ft. 15^{h} to 18^{h} G. M. T. Zodiacal light bright. Watched it carefully during the evening and there was no perceptible movement of apex of cone among the stars. The zodiacal band across the sky was quite noticeable when one took a general view of the Milky Way and was in general one-fourth as bright. Made no especial search for Gegenschein but think that its region was bright over extensive area.

13. April 1. Prescott, A. T. (9). 5700 ft. $16^{\text{h}} 05^{\text{m}}$ G. M. T. R. A. $194^{\circ}.0$, Dec. $-4^{\circ}.8$, Diam. $9^{\circ}.1$.

14. April 4. Flagstaff, A. T. (11). 7170 ft. 15^{h} to 16^{h} G. M. T. Zodiacal band across sky shows quite easily.

15. April 5. Flagstaff, A. T. (11). 7170 ft. $15^{\text{h}} 37^{\text{m}}$ G. M. T. Zodiacal band shows quite easily.

16. April 6. Flagstaff, A. T. (11). 7170 ft. $17^{\text{h}} 25^{\text{m}}$ G. M. T. R. A. $195^{\circ}.7$, Dec. $-7^{\circ}.3$, Diam. $7^{\circ}.7$. Gegenschein and zodiacal band easily seen.

17. April 7. Flagstaff, A. T. (12). 8180 ft. $16^{\text{h}} 55^{\text{m}}$ G. M. T. R. A. $198^{\circ}.5$, Dec. $-9^{\circ}.0$, Diam. $6^{\circ}.0$.

18. April 26. Flagstaff, A. T. (11). 7170 ft. $15^{\text{h}} 45^{\text{m}}$ G. M. T. Zodiacal band can be seen from W. horizon to Saturn but Gegenschein does not yet show well.

19. April 29. Flagstaff, A. T. (11). 7170 ft. $15^{\text{h}} 48^{\text{m}}$ G. M. T. R. A. $217^{\circ}.0$, Dec. $-14^{\circ}.0$, Diam. $8^{\circ}.7$.

20. May 3. Flagstaff, A. T. (11). 7170 ft. $16^{\text{h}} 19^{\text{m}}$ G. M. T. Zodiacal band shows brilliantly from W. horizon to Saturn but Gegenschein does not show well.

21. May 4. Flagstaff, A. T. (11). 7170 ft. $15^{\text{h}} 47^{\text{m}}$ G. M. T. R. A. $207^{\circ}.7$, Dec. $-9^{\circ}.9$, Diam. $4^{\circ}.8$. Zodiacal band bright from W. horizon to Saturn, decreasing gradually in intensity towards the east. If anywhere apex is in Cancer. (This position is some

15° from the point opposite the Sun and presumably has no value).

The following additional observations were made by Mr. E. Ronsie of Flagstaff, being the first work of this kind he has done. His point of observation has an approximate elevation above the sea of 6900 ft.

22. May 5. 19^h 07^m G. M. T. R. A. 217°.3, Dec. — 9°.3, Diam. E. and W. 12°, N. and S. 5°.

23. May 6. 19^h 20^m G. M. T. Two regions:—R. A. 218°.7, Dec. — 10°.0, Diam. 8°, and R. A. 208°, Dec. — 8°, Diam. 5°.

24. May 8. 20^h 10^m G. M. T. Band 4° or less in width, 2° N. of ecliptic, extending from R. A. 203° to R. A. 228°. Widest point at R. A. 213°.

25. May 9. 19^h 25^m G. M. T. Two regions:—R. A. 230°, Dec. — 21°, Diam. 4°, and R. A. 212°, Dec. — 10°, Diam. 4°.

26. May 10. 19^h 40^m G. M. T. R. A. 228°, Dec. — 17°.5, Diam. 5°, and a band 3° wide from α to λ Virginis.

For the convenience of those who wish to make use of these observations I here insert the geographical positions of the various places mentioned above.

	h	m	°	'		h	m	°	'				
Halstead, Kan.	6	30	W.	38	00	N.	Tucson, A. T.	7	24	W.	32	18	N.
Las Vegas, N. M.	7	01	"	35	30	"	Tempe, A. T.	7	28	"	33	28	"
Blanchard, N. M.	7	02	"	35	12	"	Phoenix, A. T.	7	28	"	33	28	"
Benson, A. T.	7	21	"	31	58	"	Prescott, A. T.	7	30	"	34	32	"
Tombstone, A. T.	7	20	"	31	40	"	Flagstaff, A. T.	7	27	"	35	12	"

It will be observed that when expressed in local time these observations are all rather early in the evening, which will explain the difficulty in seeing the Gegenschein in observations 18 and 20 and probably the large disagreement in observation 21.

The remarks under observation 12 have reference to a phenomenon observed several times in South America and in Cambridge, namely, a rapid westerly movement of the apex of the eastern zodiacal cone with reference to the stars, suggesting a large parallax. Several times this has been watched for in the western cone without success. Two observations made in South America have in general been confirmed; first, elevation of the observer above the sea has no noticeable effect except that at sea-level observations cannot be made so near the horizon; and second, the existence of a very thin haze in the atmosphere does not affect the Gegenschein and kindred phenomena so much as it does the equally faint outlying portions of the Milky Way.

LOWELL OBSERVATORY, Flagstaff, A. T.

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