

at S., $0^{\circ} 00'$, $0^{\circ} 20' W.$, $0^{\circ} 20' W.$ The aurora was again brightening when, from my fingers being nearly frozen, I was obliged to leave off.

Time at beginning 16h. 15m. 30s.

— ending 16 24 00

Interval 8 30

Thermometer, observatory, -14° , air, -52° . Calm and misty.

December 23d.—There had been aurora all the evening, and at 10h. P. M. the needle was in slight motion at $0^{\circ} 40' W.$ At midnight the aurora was generally diffused; the principal stream being at E., and extending almost across the zenith to W. b. S. It flowed in three distinct bands, which separated or forked into three others, whose faint extremities expanded 20° , and were there joined by an irregular band of rays that completed the semi-circle. The needle moved from $1^{\circ} 40' W.$ to $2^{\circ} 20' W.$; bright at S. W., $1^{\circ} 55' W.$, $2^{\circ} 15' W.$, $1^{\circ} 58' W.$; motion W. N. W. to S. E., $2^{\circ} 12' W.$, $1^{\circ} 55' W.$, $2^{\circ} 10' W.$; faint mass at S. W., $1^{\circ} 57' W.$, $2^{\circ} 05' W.$, $1^{\circ} 50' W.$; spiral band N. E. to E., $2^{\circ} 00' W.$, $1^{\circ} 55' W.$, $1^{\circ} 58' W.$, $1^{\circ} 48' W.$, $1^{\circ} 55' W.$, $1^{\circ} 48' W.$, $1^{\circ} 55' W.$; motion N. to E., $1^{\circ} 48' W.$, $1^{\circ} 55' W.$, $1^{\circ} 48' W.$

Time at beginning, 17h. 59m. 00s.

— ending 18 03 30

Interval 24 40

Temperature, observatory, -49° , air, -58° . Calm, blue sky, and misty.

December 25th.—At 9h. A. M. the needle was vibrating in the same manner as when the aurora was present; and the sky was clear, except an arch of very streaky and filmy clouds which extended from W. across the zenith to E. The resemblance to the coruscations was perfect, but I could not detect any motion; yet the needle indicated such; for it varied in the readings between $0^{\circ} 30' E.$ and $0^{\circ} 55' E.$ at noon: a light mass of cloud remained at E. b. S.; the sun was bright, about $3^{\circ} 30'$ high, and a light breeze prevailed from E. b. N. (true); still the needle was moving between $1^{\circ} 10' E.$ and $1^{\circ} 30' E.$ Thermometer, observatory, $-33\frac{1}{2}^{\circ}$, air, -37° , sun, 36° .

January 12th.—There was a calm nearly all day, the weather sometimes clear, sometimes overcast, and the needle had been found always vibrating slowly and unequally. At 10h. P. M. the moon was dimly seen through the gray haze that overcast the sky: it bore E. I found the needle moving at $1^{\circ} 00' E.$, and immediately ran out, but could not detect any aurora, except by a softened flaky appearance for a moment at S. E., at an angle of about 45° ; on my return, the needle was still vibrating at $1^{\circ} 20' E.$, from which it went at once to $7^{\circ} 50' E.$, the farthest I ever