

ART. XLVI.—*On the Remarkable Aurora of September 12–13, 1881; by J. M. SCHAEBERLE.*

THE night of Sept. 12–13, 1881, witnessed one of the grandest displays of aurora ever seen in this latitude. Beginning soon after sunset and lasting until the approach of day, the various phenomena which presented themselves during this time are deserving of being placed on permanent record.

The following are some of the notes taken during the night:

7^h 30^m.—Ann Arbor, mean time. A grand continuous arch seen spanning the northeastern sky, beginning in the horizon at E. 1° N., and ending N. 45° W.; altitude of highest point of arch 30°; breadth, 5° (close resemblance to cirrus clouds). A second arch, enclosed by the first and 10° from it, quite bright. Space between the arches clear as any part of the sky.

7^h 35^m. At the eastern extremity of the large arc are streamers inclined 70° to the horizon.

7^h 37^m. Four bright streamers in the east, 15° long, 1½° wide, and 2° from each other.

7^h 41^m. Bright streamer, 40° long, 1½° broad, E. 10° N. Bright auroral light in northern horizon; most intense, N. 40° E.

7^h 42^m. Broad sheet of streamers in the east; horizontal motion from east to west, very marked; rate, 1° in 8 seconds of time. Large arch has disappeared.

7^h 50^m. Dark segment; greatest altitude 3°, at N. 20° E. α Aurigæ seen through the same with undiminished luster.

7^h 56^m. Streamers 5° long between N. 30° W., and N. 70° E. It is very evident that the dark segment is nothing but the clear sky, for occasionally a streamer starts from the very horizon and in moving west the dark space seems to offer no resistance.

8^h 2^m. Streamers 15° long; a detached one in Cassiopeia, 45° from the horizon, seen moving westward at the rate of 1° in 3 seconds.

8^h 5^m. Dark segment 5° high; streamers form one continuous sheet of light. In the northeast streamers start 2° from horizon and in their motion westward plough through the dark space.

8^h, 12^m–20^m. Bright arch from N. 30° W. to N. 60° E.; greatest elevation, 10°; occasional streamers, from 3° to 5° in length, shooting from it. Electric lightning in the east.

8^h 31^m. Streamers in the north 15° long; dark segment 6° high, but very irregular in outline.

8^h 33^m. Continuous sheet of light in N.N.E.; no arch.

11^h 45^m. Up to the present time only the auroral twilight could be seen. Moon about three hours high; signs of returning activity; dark segment 7° high.

11^h 53^m. Bright streamer 40° long, N. 10° E.

11^h 54^m. Three arches; whole northern sky covered with streamers 45° in length.

11^h 56^m. Streamers of a reddish tinge, 55° in length; arch broken near the north point; western portion wanting.

12^h 0^m. Arch 15° high, symmetrical with respect to the meridian. Irregular black patches distributed throughout the space enclosed by the arch; sky in the northwest has a reddish tinge. Motion from east to west, 1° in 3 seconds.

12^h 10^m. Waves toward the zenith very violent; streamers 50° long.

12^h 13^m–17^m. Whole northern sky up to 45° altitude, in great commotion; streamers 60° long.

12^h 30^m–60^m. Streamers from the east and west points of horizon meet south of the zenith, within the square of Pegasus, several parallel spans formed and broken at short intervals.

13^h. Streamers extend 15° southeast of the point of convergence, which is now near α Andromedæ.

13^h 20^m. Arch from east to west, altitude 25°; vigorous action of auroral waves.

13^h 30^m. The crossing of the streamers in the zenith gives the appearance of a zigzag motion.

13^h 30^m. Point of convergence near δ Andromedæ.

13^h 41^m. Remarkable streamer E. 30° N., beginning in the horizon and for a distance of 8° making an angle of only 30° with it, then suddenly changing its direction to parallelism with the other streamers each side of it which are inclined 75° to the horizon.

13^h 55^m. Sudden abatement of vigorous action; looks as though the display was coming to a close.

14^h 2^m. Two arches formed, one in the N.E. the other in the N.N.W., joining each other in the horizon 15° east of north point.

Observations resumed at 15^h 45^m. The view now presented to the observer baffles all description. The whole northern sky from N. 55 W., to N. 55 E. and from the horizon to 60° altitude is one mass of moving fire. The auroral waves succeed each other with great rapidity. Each wave extends throughout the entire width of the aurora, and the flashes toward the zenith are in the form of segments of small circles or zones parallel to the horizon. In the northeast the phenomenon known as the *merry dancers* is very beautiful. A little to the west of north sudden outbursts of light, similar to sheet lightning and having the form of cumulus clouds, instantly appear and disappear at short intervals.

This description can give but a faint idea of the appearance of the aurora at the close of my observations. Although the moon was still two days from last quarter the phenomena were seen with a vividness truly remarkable. On the following evening the auroral twilight was quite bright until the moon came up. An arch was formed and broken several times. About nine o'clock the northern sky had the appearance of being covered with faint streamers 40° long. Later the aurora gradually died out, and by eleven o'clock no trace of it could be seen.