

On August 28, 1859 a massive solar storm caused spectacular aurora seen all over the globe. It was reported in all the major newspapers, poems were written about it, and famous artists painted its shapes and forms. It also caused severe problems with telegraph networks at the time, which lasted for many hours world-wide. Although scientists gave detailed reports of the changing forms of this vivid display, many ordinary citizens offered their own impressions of this event too. Below are two of these descriptions seen from two different locations.

Galveston, Texas:

August 28 as early as twilight closed, the northern sky was reddish, and at times lighter than other portions of the heavens. At 7:30 PM a few streamers showed themselves. Soon the whole sky from Ursa Major to the zodiac in the east was occupied by the streams or spiral columns that rose from the horizon. Spread over the same extent was an exquisite roseate tint which faded and returned. Stately columns of light reaching up about 45 degrees above the horizon moved westward. There were frequent flashes of lightning along the whole extent of the aurora. At 9:00 PM the whole of the streaking had faded leaving only a sort of twilight over the northern sky.”

London, England.

“At 0:15 AM on August 28th the auroral light in the north assumed the form of a luminous arch, similar to daybreak, and in the southwest there was an intense glare of red covering a very large extent of the sky. At 00:20 AM streamers appeared; at 00:25 AM the streamers rose to the zenith and were tinged with crimson at their summits. At 00:45 AM frequent coruscations appeared in the aurora. At 01:20 AM the arch which had partially faded began to reform and the body of the light was very strong but not bright enough to read newspaper print. At 1:30 AM the light had begun to fade. By 2:00 AM the aurora was very indistinct.”

Question 1: From these two descriptions, extract the specific points of each narrative. What are their similarities and differences?

Question 2: From the sequences of events in each description, can you create a timeline for the aurora display that fits the most details?

Answer - Extra Credit Problem

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Question 1: From these two descriptions, extract the specific points of each narrative. What are their similarities and differences?

Answer: Here are the main points in each story.

Story 1:

1. Display began at end of twilight with faint reddish light in north.
2. 7:30 PM streamers began to appear
3. Streamers of spiral columns filled eastern sky
4. Faint rose-colored light covered same eastern sky, fading and returning
5. Columns of light reached 45 degrees to zenith, and moved westwards
6. Frequent flashes of light along the whole aurora
7. 9:00 PM, the aurora faded and left a twilight glow in north.

Story 2:

1. 00:15 AM - Luminous arch appeared in northern sky
2. 00:16 AM - Intense glare of red in southwest
3. 00:20 AM - Streamers appeared
4. 00:25 AM - Streamers reached zenith and were crimson at highest points
5. 00:45 AM - Frequent coruscations appeared in aurora
6. 01:20 AM - Arch begins to fade and reform
7. 01:30 AM - Aurora begins to fade.
8. 02:00 AM - Aurora very indistinct.

Question 2: From the sequences of events in each description, can you create a common timeline for the aurora display that fits the most details?

Answer: Each student might group the events differently because the eyewitness accounts are not detailed enough. Because this aurora is seen in the Northern Hemisphere, it is properly called the Aurora Borealis. Here is one way to organize the timeline:

“The aurora borealis started with a faint wash of reddish light in the north. A brilliant arch of light formed. Five minutes later, streamers began to appear which were crimson at their highest points above the horizon. Then, coruscations (waves) began to appear in the brightening red glow of the aurora with the streamers filling the entire eastern sky. The columns of light and streamers began to move westwards, and frequent flashes of light were seen along the aurora as the luminous arch of began to fade and reform. After an hour and fifteen minutes, the aurora began to fade away, leaving behind a twilight glow that persisted for another half-hour.”