

HALO PHENOMENA OBSERVED DURING FEBRUARY, 1919.

By WILLIS RAY GREGG, Meteorologist.

| Station. | Altitude. | Latitude. | Longitude. | Date. | Form observed. | Time of— | | Theodolite readings. | | | | | | | | | |
|----------------------|------------------------|-------------|-------------|---------------------|------------------------|-------------|-------------|----------------------|------------------------|-----------------|----------------|----------------------------|--------------------------|--|--|--|--|
| | | | | | | Beginning. | Ending. | Time. | Radius inside. | Radius outside. | Length of arc. | Distance from sun or moon. | Altitude of sun or moon. | | | | |
| Broken Arrow, Okla.* | m. 233 | 36 02 | 95 49 | 4 | Solar halo, 22° | 12:45 p. m. | | 2:20 p. m. | 23 | 23.5 | 360 | | 32 | | | | |
| | | | | | Solar halo, 22° | 8:45 a. m. | 3:30 p. m. | | | | | | | | | | |
| | | | | | Lunar halo, 22° | 8:20 p. m. | D. N. | | | | | | | | | | |
| | | | | | Solar halo, 22° | 7:45 a. m. | 8:10 a. m. | 7:55 a. m. | 21.5 | 22.6 | 20 | | 12.1 | | | | |
| Canton, N. Y. | 137 | 44 36 | 75 10 | 28 | Parheliion, right, 22° | 7:45 a. m. | 8:10 a. m. | 7:55 a. m. | | | | 22 | | | | | |
| | | | | 28 | Parheliion, left, 22° | 7:45 a. m. | 8:10 a. m. | 7:55 a. m. | | | | 22 | | | | | |
| | | | | 10 | Lunar halo, 22° | 9:00 p. m. | 10:25 p. m. | | | | | | | | | | |
| | | | | 11 | Lunar halo, 22° | 9:20 p. m. | 11:00 p. m. | | | | | | | | | | |
| | | | | 11 | Parasclene, right, 22° | 9:20 p. m. | 10:00 p. m. | | | | | | | | | | |
| | | | | 11 | Lunar halo, 46° | 9:50 p. m. | 10:03 p. m. | | | | | | | | | | |
| | | | | 13 | Solar halo, 32° | 2:10 p. m. | 3:00 p. m. | | | | | | | | | | |
| | | | | 17 | Solar halo, 22° | 2:12 p. m. | 2:35 p. m. | | | | | | | | | | |
| | | | | 18 | Solar halo, 22° | 8:25 a. m. | 9:10 a. m. | | | | | | | | | | |
| | | | | 27 | Light pillar | 5:21 p. m. | 5:42 p. m. | | | | | | | | | | |
| Cincinnati, Ohio. | 191 | 39 06 | 84 30 | 7 | Solar halo, 18° | 5:20 p. m. | 5:40 p. m. | | | | | | | | | | |
| | | | | 28 | Solar halo, 22° | 2:10 p. m. | 3:05 p. m. | | | | | | | | | | |
| | | | | 7 | Upper tangent arcs | 10:05 a. m. | 3:10 p. m. | | | | | | | | | | |
| | | | | 8 | Solar halo, 22° | 11:35 a. m. | 12:30 p. m. | | | | | | | | | | |
| | | | | 8 | Lunar halo, 22° | 5:50 p. m. | 9:15 p. m. | | | | | | | | | | |
| | | | | 11 | Lunar halo, 22° | 8:25 p. m. | 8:40 p. m. | | | | | | | | | | |
| | | | | 24 | Solar halo, 22° | 10:55 a. m. | 11:50 a. m. | | | | | | | | | | |
| | | | | 24 | Solar halo, 22° | 8:05 a. m. | 3:20 p. m. | | | | | | | | | | |
| Dayton, Ohio. | 274 | 39 46 | 84 10 | 7 | Solar halo, 22° | 12:55 p. m. | 1:15 p. m. | | | | | | | | | | |
| | | | | 8 | Solar halo, 22° | 3:10 p. m. | 3:45 p. m. | | | | | | | | | | |
| | | | | 8 | Lunar halo, 22° | 5:50 p. m. | D. N. p. | | | | | | | | | | |
| | | | | 12 | Lunar halo, 22° | 8:30 p. m. | 9:00 p. m. | | | | | | | | | | |
| Drexel, Nebr.* | 396 | 41 20 | 96 16 | 7 | Solar halo, 22° | 4:50 p. m. | 4:58 p. m. | 4:55 p. m. | 21.5 | 22.5 | 5 | | 10 | | | | |
| | | | | 7 | Lunar halo, 22° | 7:10 p. m. | 7:45 p. m. | 7:15 p. m. | 22 | 23 | 360 | | 66 | | | | |
| | | | | 11 | Lunar halo, 22° | 10:50 p. m. | 11:08 p. m. | 11:06 p. m. | 22 | 22.5 | 360 | | 64 | | | | |
| | | | | 12 | Solar halo, 22° | 11:40 a. m. | 12:24 p. m. | 12:15 p. m. | 22 | 22.5 | 300 | | 34 | | | | |
| | | | | 15 | Solar halo, 22° | 12:25 p. m. | 4:30 p. m. | 1:41 p. m. | 22 | 22.5 | 180 | | 33 | | | | |
| | | | | 15 | Upper tangent arcs | 3:08 p. m. | 3:14 p. m. | 3:14 p. m. | 10 | | 22.5 | | 24 | | | | |
| | | | | 19 | Solar halo, 22° | 10:13 a. m. | 10:30 a. m. | 10:20 a. m. | 21.5 | 22.5 | 200 | | 28 | | | | |
| | | | | 28 | Solar halo, 22° | 8:10 a. m. | 10:25 a. m. | 9:05 a. m. | 22 | 22.5 | 360 | | 20 | | | | |
| | | | | 28 | Parheliion, right, 22° | 8:10 a. m. | 9:30 a. m. | 9:05 a. m. | 3 | | 3 | | 20 | | | | |
| | | | | 28 | Parheliion, left, 22° | 8:10 a. m. | 9:30 a. m. | 9:05 a. m. | 3 | | 3 | | 20 | | | | |
| | | | | 28 | Circumzenithal arc | 8:10 a. m. | 9:30 a. m. | 9:05 a. m. | 12 | | 46 | | 20 | | | | |
| | | | | Ellendale, N. Dak.* | 444 | 45 59 | 98 34 | 8 | Lunar halo, 22° | 7:20 p. m. | D. N. | | | | | | |
| 9 | Lunar halo, 22° | 7:15 p. m. | D. N. | | | | | | | | | | | | | | |
| 15 | Solar halo, 22° | 8:25 p. m. | 2:30 p. m. | | | | | 8:58 a. m. | 22.5 | 23 | 220 | | 12 | | | | |
| 16 | Solar halo, 22° | 10:20 a. m. | 12:15 p. m. | | | | | | | | | | | | | | |
| 25 | Parheliion, right, 22° | 4:10 p. m. | 6:15 p. m. | | | | | | | | | | | | | | |
| 25 | Parheliion, left, 22° | 4:10 p. m. | 6:15 p. m. | | | | | | | | | | | | | | |
| Grossbeck, Tex.* | 141 | 31 30 | 96 28 | 15 | Solar halo, 22° | 12:10 p. m. | 4:00 p. m. | 1:10 p. m. | 22 | 24.5 | 360 | | 45.5 | | | | |
| | | | | 18 | Solar halo, 22° | 3:50 p. m. | 4:00 p. m. | 3:55 p. m. | 22 | 25.5 | 30 | | 26 | | | | |
| | | | | 23 | Solar halo, 22° | 1:45 p. m. | 3:18 p. m. | 1:48 p. m. | 23 | 26 | 180 | | 44 | | | | |
| | | | | 23 | Solar halo, 22° | 1:45 p. m. | 3:18 p. m. | 1:48 p. m. | 23 | 26 | 180 | | 44 | | | | |
| Leesburg, Ga.* | 85 | 31 47 | 84 14 | 1 | Solar halo, 22° | 6:59 a. m. | 12:00 p. m. | 11:00 a. m. | 22 | | 360 | | | | | | |
| | | | | 8 | Solar halo, 22° | 2:00 p. m. | 2:15 p. m. | 2:10 p. m. | 22 | | 10 | | | | | | |
| | | | | 10 | Solar halo, 22° | 3:25 p. m. | 4:40 p. m. | 4:10 p. m. | 23 | | 300 | | | | | | |
| | | | | 10 | Lunar halo, 22° | 5:51 p. m. | 10:15 p. m. | 6:45 p. m. | 23 | | 360 | | | | | | |
| | | | | 12 | Solar halo, 22° | 11:06 a. m. | 11:27 a. m. | 11:17 a. m. | 23 | | 165 | | 10 | | | | |
| | | | | 12 | Solar halo, 22° | 3:45 p. m. | 4:02 p. m. | 3:53 p. m. | 23 | | 10 | | | | | | |
| | | | | 12 | Parheliion, right, 22° | 3:45 p. m. | 4:02 p. m. | 3:53 p. m. | | | | 22 | 16 | | | | |
| | | | | 12 | Parheliion, left, 22° | 3:45 p. m. | 4:02 p. m. | 3:53 p. m. | | | | 22 | 16 | | | | |
| | | | | 12 | Parhelic circle | 3:45 p. m. | 4:02 p. m. | 3:53 p. m. | | | 17 | | 16 | | | | |
| | | | | 16 | Solar halo, 22° | 12:23 p. m. | 12:36 p. m. | 12:26 p. m. | 22 | | 20 | | | | | | |
| | | | | 19 | Solar halo, 22° | 11:20 a. m. | 2:54 p. m. | 2:25 p. m. | 22 | | 300 | | | | | | |
| | | | | 24 | Solar halo, 22° | 12:30 p. m. | 12:45 p. m. | 12:32 p. m. | 22 | | 75 | | | | | | |
| | | | | 26 | Solar halo, 22° | 1:32 p. m. | 1:56 p. m. | 1:47 p. m. | 22 | | 148 | | | | | | |
| | | | | Madison, Wis. | 297 | 43 05 | 89 23 | 2 | Solar halo, 22° | 8:00 a. m. | 1:00 p. m. | | | | | | |
| | | | | | | | | 5 | Solar halo, 22° | 4:00 p. m. | Sunset. | | | | | | |
| | | | | | | | | 5 | Parheliion, right, 22° | 3:48 p. m. | Sunset. | | | | | | |
| 5 | Upper tangent arcs | 4:00 p. m. | Sunset. | | | | | | | | | | | | | | |
| 6 | Solar halo, 22° | 8:40 a. m. | 8:50 a. m. | | | | | | | | | | | | | | |
| 6 | Parheliion, right, 22° | 8:40 a. m. | 8:50 a. m. | | | | | | | | | | | | | | |
| 6 | Parheliion, left, 22° | 8:40 a. m. | 8:50 a. m. | | | | | | | | | | | | | | |
| 6 | Upper tangent arcs | 8:40 a. m. | 8:45 a. m. | | | | | | | | | | | | | | |
| 6 | Solar halo, 46° | 8:35 a. m. | 8:40 a. m. | | | | | | | | | | | | | | |
| 7 | Solar halo, 22° | 10:45 a. m. | 11:00 a. m. | | | | | | | | | | | | | | |
| 7 | Parheliion, right, 22° | 4:15 p. m. | Sunset. | | | | | | | | | | | | | | |
| 7 | Upper tangent arcs | 4:15 p. m. | Sunset. | | | | | | | | | | | | | | |
| 8 | Lunar halo, 22° | 6:20 p. m. | 9:00 p. m. | | | | | | | | | | | | | | |
| 11 | Solar halo, 22° | 12:20 p. m. | 12:30 p. m. | | | | | | | | | | | | | | |
| 12 | Lunar halo, 22° | 6:40 p. m. | 8:45 p. m. | | | | | | | | | | | | | | |
| 15 | Solar halo, 22° | 11:40 a. m. | 1:40 p. m. | | | | | | | | | | | | | | |
| 16 | Lunar halo, 22° | 8:45 p. m. | 10:30 p. m. | | | | | | | | | | | | | | |
| 19 | Solar halo, 22° | 10:30 a. m. | | | | | | | | | | | | | | | |
| 23 | Solar halo, 22° | 1:50 p. m. | 3:15 p. m. | | | | | | | | | | | | | | |
| 24 | Solar halo, 22° | 8:10 a. m. | | | | | | | | | | | | | | | |
| 26 | Solar halo, 22° | 9:30 a. m. | | | | | | | | | | | | | | | |
| Nashville, Tenn. | 166 | 36 10 | 86 47 | 10 | Lunar halo, 22° | | | 7:30 p. m. | | | | | | | | | |
| | | | | 2 | Solar halo, 22° | 7:30 a. m. | 2:00 p. m. | 8:40 a. m. | 22.3 | 23.3 | 225 | | 16.2 | | | | |
| | | | | 2 | Upper tangent arcs | 8:00 a. m. | 2:00 p. m. | 8:40 a. m. | | | 60 | 22 | 16.2 | | | | |
| | | | | 2 | Solar halo, 46° | 8:50 a. m. | 11:05 a. m. | 9:11 a. m. | 46 | 47 | 180 | | 18 | | | | |
| | | | | 10 | Solar halo, 22° | 12:40 p. m. | 1:40 p. m. | 12:30 p. m. | | | 370 | | | | | | |
| | | | | 12 | Solar halo, 22° | 9:15 a. m. | 4:05 p. m. | 9:30 a. m. | | | 360 | | | | | | |
| | | | | 24 | Solar halo, 22° | 8:35 a. m. | 3:15 p. m. | 8:36 a. m. | | | 180 | | | | | | |
| | | | | 25 | Solar halo, 22° | 1:55 p. m. | 2:02 p. m. | 2:02 p. m. | 5 | 9 | 120 | | | | | | |
| | | | | 26 | Solar halo, 22° | 10:14 a. m. | 1:20 p. m. | 1:15 p. m. | 22 | 23 | 180 | | 37.5 | | | | |
| | | | | 26 | Parhelic circle | 10:14 a. m. | 10:14 a. m. | 10:14 a. m. | | | 150 | | | | | | |
| Royal Center, Ind.* | 225 | 40 53 | 86 29 | 27 | Solar halo, 22° | 10:15 a. m. | 12:15 p. m. | 11:50 a. m. | 22.5 | 24.3 | 360 | | 41.8 | | | | |

* Aerological station.

Halo Phenomena Observed During February, 1919—Continued.

| Station. | Altitude. | Latitude. | Longitude. | Date. | Form observed. | Time of— | | Theodolite readings. | | | | | |
|---------------------------|--------------------|-------------|-------------|-----------------|-----------------------|-------------|-------------|----------------------|----------------------|-----------------|----------------|----------------------------|--------------------------|
| | | | | | | Beginning. | Ending. | Time. | Radius inside. | Radius outside. | Length of arc. | Distance from sun or moon. | Altitude of sun or moon. |
| Tatoosh Island, Wash..... | m. 26 | 48 23 | 124 44 | 5 | Solar halo, 22° | 1:05 p. m. | 2:40 p. m. | | | | | | |
| | | | | 5 | Parhelion, right, 22° | 2:00 p. m. | 2:11 p. m. | | | | | | |
| | | | | 5 | Parhelion, left, 22° | 2:18 p. m. | 2:19 p. m. | | | | | | |
| | | | | 5 | Lunar halo, 22° | 7:30 p. m. | 7:35 p. m. | | | | | | |
| | | | | 6 | Solar halo, 22° | 9:55 a. m. | 11:10 a. m. | | | | | | |
| | | | | 6 | Lunar halo, 22° | 7:35 p. m. | | | | | | | |
| | | | | 7 | Solar halo, 22° | 10:00 a. m. | 4:25 p. m. | | | | | | |
| | | | | 9 | Solar halo, 22° | 3:58 p. m. | 4:05 p. m. | | | | | | |
| | | | | 13 | Solar halo, 22° | 10:42 a. m. | 3:20 p. m. | | | | | | |
| | | | | 13 | Parhelion, left, 22° | 11:06 a. m. | 11:10 a. m. | | | | | | |
| | | | | 16 | Solar halo, 22° | 12:03 p. m. | 4:30 p. m. | | | | | | |
| | | | | 17 | Lunar halo, 22° | D. N. a. | 6:25 a. m. | | | | | | |
| | | | | 17 | Solar halo, 22° | 5:05 p. m. | 5:06 p. m. | | | | | | |
| | | | | 18 | Solar halo, 22° | 9:44 a. m. | 10:25 a. m. | | | | | | |
| | | | | 18 | Solar halo, 46° | 9:50 a. m. | 10:20 a. m. | | | | | | |
| | | | | 19 | Solar halo, 22° | 11:50 a. m. | 2:44 p. m. | | | | | | |
| | | | | 21 | Lunar halo, 22° | D. N. a. | 5:26 a. m. | | | | | | |
| | | | | 26 | Solar halo, 22° | 2:29 p. m. | 2:46 p. m. | | | | | | |
| | | | | 28 | Solar halo, 22° | 12:12 p. m. | 1:28 p. m. | | | | | | |
| | | | | York, N. Y..... | 232 | 42 52 | 77 53 | 28 | Parhelion, left, 22° | 12:48 p. m. | 12:55 p. m. | | |
| 28 | Upper tangent arc. | 12:33 p. m. | 1:27 p. m. | | | | | | | | | | |
| 7 | Lunar halo. | 7:00 p. m. | 10:15 p. m. | | | | | 8:00 p. m. | 23 | 30 | 360 | | 54.3 |
| 7 | | | | | | | | 8:05 p. m. | 28 | 30 | 360 | | 47 |
| 7 | | | | | | | | 8:15 p. m. | 23 | 31 | 360 | | 55 |
| 7 | | | | | | | | 8:25 p. m. | 22 | 30 | 360 | | 53 |
| 11 | Solar halo, 22° | 10:30 a. m. | 12:30 p. m. | | | | | | | | | | |
| 11 | Lunar halo, 22° | 6:15 p. m. | 7:50 p. m. | | | | | | | | | | |
| 13 | Solar halo, 22° | 12:30 p. m. | 1:30 p. m. | | | | | | | | | | |
| 19 | Lunar halo, 22° | | 9:45 a. m. | | | | | | | | | | |
| 20 | Solar halo, 22° | 4:30 p. m. | 5:15 p. m. | | | | | | | | | | |
| 24 | Solar halo, 22° | 3:30 p. m. | 4:30 p. m. | | | | | | | | | | |
| 28 | Solar halo, 22° | 10:20 a. m. | 11:30 a. m. | | | | | | | | | | |

| Station. | Date. | Colors.† | Degree of brightness. | Clouds. | | | Station pressure. | Precipitation. | |
|-----------------------|------------|------------------|-----------------------|---------|---------|------------|-------------------|----------------------|-------------------------|
| | | | | Amount. | Kind. | Direction. | | Last previous ended. | First subsequent began. |
| Broken Arrow, Okla.* | 4 | Y | Bright | 8 | Cl. st. | sw. | Stationary | D. N. p., 2d. | D. N. a., 8th. |
| | 6 | Y | Dim. | 8 | Cl. st. | w. | Stationary | D. N. p., 2d. | D. N. a., 8th. |
| | 12 | Y | Dim. | 9 | Cl. st. | s. | Falling | 4:30 p. m., 12th. | D. N. a., 13th. |
| | 28 | R, Y | Bright | 7 | St. cu. | wnw. | Rising | 7:10 a. m., 28th. | 8:05 a. m., 28th. |
| Canton, N. Y..... | 10 | O | Dim. | 2 | Cl. st. | w. | Stationary | D. N. a., 9th. | D. N. a., 14th. |
| | 11 | O | Brilliant | 4 | Cl. st. | w. | Falling | D. N. a., 9th. | D. N. a., 14th. |
| | 11 | O | Dim. | 2 | Cl. st. | w. | Falling | D. N. a., 9th. | D. N. a., 14th. |
| | 13 | O | Dim. | 1 | Cl. st. | w. | Falling | 3:35 p. m., 16th. | 2:23 p. m., 21st. |
| | 17 | O | Dim. | 3 | Cl. st. | w. | Falling | 3:35 p. m., 16th. | 2:23 p. m., 21st. |
| | 18 | R | Bright | 1 | Cl. | w. | Rising | | |
| Cincinnati, Ohio..... | 27 | R, O, G | Bright | 2 | Cl. st. | w. | Stationary | 1:22 p. m., 26th. | D. N. a., 28th. |
| | 27 | R, O, G | Bright | 2 | A. st. | w. | | | |
| | 28 | O | Dim. | 1 | St. | e. | Falling | D. N. a., 28th. | |
| | 7 | R, O, Y, G, B, V | Bright | 10 | A. st. | sw. | Falling | D. N. a., 4th. | 5:55 a. m., 9th. |
| | 8 | R, O, Y | Dim. | 9 | Cl. st. | w. | Falling | D. N. a., 4th. | 5:55 a. m., 9th. |
| Dayton, Ohio..... | 11 | R, O, Y, G | Bright | 10 | A. st. | w. | Stationary | | |
| | 21 | R, O, Y, G | Dim. | 7 | Cl. st. | wnw. | Falling | 5:00 p. m., 11th. | 4:00 a. m., 14th. |
| | 2 | R | Dim. | 10 | A. st. | w. | Falling | 11:30 a. m., 23d. | 5:45 a. m., 25th. |
| | 7 | R | Dim. | 6 | Cl. st. | nw. | Falling | 12:45 p. m., 23d. | 7:15 a. m., 3d. |
| Drexel, Nebr.* | 8 | R | Dim. | 10 | Cl. st. | w. | Falling | 6:30 a. m., 4th. | 6:05 p. m., 7th. |
| | 8 | R | Dim. | 7 | Cl. st. | w. | Stationary | D. N. p., 7th. | D. N. a., 9th. |
| | 8 | R | Bright | 10 | Cl. st. | w. | Stationary | D. N. p., 7th. | D. N. a., 9th. |
| | 12 | R | Dim. | 10 | Cl. st. | sw. | Falling | 7:08 p. m., 12th. | D. N. a., 13th. |
| | 7 | O, W | Bright | 2 | Cl. st. | wnw. | Stationary | 2:28 p. m., 6th. | 10:42 a. m., 8th. |
| | 7 | W | Dim. | 4 | A. st. | w. | | | |
| | 11 | W | Dim. | 4 | A. cu. | w. | Rising | | |
| | 12 | R, O, Y, G, B | Dim. | 2 | Cl. st. | w. | Stationary | 8:15 p. m., 10th. | 7:40 p. m., 12th. |
| | 15 | O, Y, G, B | Dim. | 7 | Cl. st. | sw. | Falling | 8:15 p. m., 10th. | 7:40 p. m., 12th. |
| | 15 | O, B | Dim. | 7 | Cl. st. | n. | Rising | 12:20 p. m., 15th. | 5:15 a. m., 20th. |
| Ellendale, N. Dak.* | 15 | O, B | Dim. | 3 | St. | nw. | | | |
| | 19 | W | Dim. | 4 | Cl. st. | ws | Falling | 12:20 p. m., 15th. | 5:15 a. m., 20th. |
| | 28 | R, O, Y, G, B | Bright | 2 | Cl. | sw. | Rising | 7:15 a. m., 28th. | 5:45 p. m., 3d. |
| | 28 | W | Dim. | 3 | A. cu. | sw. | | | |
| | 28 | W | Dim. | 6 | St. | nw. | | | |
| | 8 | R, O, Y, G | Bright | | | | Falling | 8:10 a. m., 7th. | D. N. a., 13th. |
| | 9 | R | Bright | | | | Falling | 9:10 a. m., 7th. | D. N. a., 13th. |
| | 15 | R | Bright | 9 | Cl. st. | nw. | Rising | 3:30 p. m., 14th. | 9:28 a. m., 17th. |
| Groesbeck, Tex.* | 16 | R | Dim. | 10 | Cl. st. | w. | Stationary | 3:30 p. m., 14th. | 9:28 a. m., 17th. |
| | 25 | R | Bright | 10 | Cl. st. | nw. | Stationary | 1:35 p. m., 24th. | D. N. a., 27th. |
| | 25 | R | Bright | | | | | | |
| | 15 | R, O, Y, G, B | Bright | 6 | Cl. st. | nw. | Stationary | 7:06 p. m., 12th. | D. N. a., 17th. |
| | 18 | R, Y, B | Dim. | 6 | Cl. st. | w. | Falling | D. N. a., 18th. | 12:10 p. m., 19th. |
| 23 | R, Y, G, B | Dim. | 7 | Cl. st. | sw. | Falling | D. N. p., 21st. | 1:28 p. m., 24th. | |

* Aerological station.

† Beginning with part nearest sun or moon: R, red; O, orange; etc.

Halo Phenomena Observed During February, 1919—Continued.

| Station. | Date. | Colors. | Degree of brightness. | Clouds. | | | Station pressure. | Precipitation. | | |
|-----------------------|---------------|-------------------|-----------------------|------------|---------|------------|-------------------|----------------------|-------------------------|-------------------|
| | | | | Amount. | Kind. | Direction. | | Last previous ended. | First subsequent began. | |
| Leesburg, Ga.* | 1 | R. | Dim. | 6 | Cl. st. | w. | Falling | D. N. a., 26th | 5:20 p. m., 2d. | |
| | 8 | R. | Dim. | Few | Cl. st. | w. | Stationary | 7:20 p. m., 5th | 8:02 a. m., 9th. | |
| | 10 | R. | Dim. | 9 | Cl. st. | nw. | Stationary | 10:21 a. m., 9th | 12:18 p. m., 11th. | |
| | 10 | R. | Dim. | 8 | Cl. st. | nw. | Rising | | | |
| | 12 | R, O, Y. | Dim. | 8 | Cl. st. | nw. | Falling | 4:50 p. m., 11th | D. N. a., 13th. | |
| | 12 | R, O, Y, G, B. | Bright. | 2 | A. cu. | w. | Falling | | | |
| | 12 | R, O, Y, G, B. | Bright. | 2 | Cu. | ssw. | | | | |
| | 12 | W. | Bright. | | | | | | | |
| | 18 | | | | 2 | Cl. st. | sw. | Falling | 4:30 p. m., 13th | 3:55 p. m., 17th. |
| | 19 | R, Y, B. | Dim. | 3 | Cl. st. | w. | Falling | 4:01 p. m., 17th | D. N. a., 20th. | |
| | 24 | R. | Dim. | 6 | A. cu. | w. | | | | |
| | 24 | R. | Dim. | 5 | Cl. st. | w. | Falling | 11:15 a. m., 22d | 4:15 p. m., 24th. | |
| | 28 | R, Y, G. | Dim. | 2 | Cl. st. | sw. | | | | |
| | 28 | R, Y, G. | Dim. | 7 | St. cu. | s. | Falling | 5:56 a. m., 28th | 2:50 p. m., 28th. | |
| | Madison, Wis. | 2 | R. | Bright. | 10 | Cl. st. | sw. | Falling | 3:00 p. m., 13th | 10:05 a. m., 3d. |
| | | 5 | W. | Dim. | 2 | Cl. st. | w. | Stationary | D. N. p., 3d | 9:00 a. m., 8th. |
| | | 5 | | | | | | | | |
| | | 6 | | Dim. | | | | | | |
| | | 6 | | Bright. | Few | Cl. st. | nw. | Stationary | D. N. p., 3d | 9:00 a. m., 8th. |
| | | 6 | | Bright. | | | | | | |
| | | 6 | | Bright. | | | | | | |
| | | 6 | | Dim. | | | | | | |
| | | 7 | W. | Dim. | 3 | Cl. st. | sw. | Stationary | D. N. p., 3d | 9:00 a. m., 8th. |
| | | 7 | R, O, Y. | Brilliant. | Few | Cl. st. | w. | | | |
| 8 | | R. | Bright. | | | | | | | |
| 8 | | W. | Bright. | 9 | Cl. st. | nw. | Stationary | 9:45 a. m., 8th | 6:30 a. m., 9th. | |
| 11 | | W. | Dim. | 1 | Cl. st. | w. | Falling | 10:00 a. m., 9th | D. N. a., 13th. | |
| 12 | | W. | Bright. | 3 | Cl. st. | w. | Stationary | 10:00 a. m., 9th | D. N. a., 13th. | |
| 15 | | R. | Bright. | 4 | Cl. st. | w. | Rising | D. N. p., 14th | 4:20 a. m., 20th. | |
| 16 | | W. | Bright. | 6 | Cl. st. | w. | Stationary | D. N. p., 14th | 4:20 a. m., 20th. | |
| 19 | | W. | Dim. | 8 | Cl. st. | w. | Stationary | D. N. p., 14th | 4:20 a. m., 20th. | |
| 23 | | W. | Dim. | 1 | Cl. st. | w. | Rising | D. N. p., 22d | 3:45 p. m., 24th. | |
| 24 | | W. | Dim. | 10 | Cl. st. | w. | Falling | D. N. p., 22d | 3:45 p. m., 24th. | |
| 24 | | W. | Dim. | 10 | Cl. st. | w. | Stationary | Snowing | | |
| 19 | | | Dim. | 4 | Cl. st. | w. | Falling | 8:40 p. m., 9th | D. N. a., 11th. | |
| Nashville, Tenn. | | 19 | R, O, Y, G, B. | Bright. | 10 | Cl. st. | w. | Stationary | 7:15 a. m., 23d | 7:18 a. m., 3d. |
| | | 2 | | Dim. | | | | | | |
| Royal Center, Ind.* | | 2 | R, O, Y, G, B. | Dim. | | | | | | |
| | 2 | R, O, Y, G, B. | Dim. | | | | | | | |
| Tatoosh Island, Wash. | 10 | R. | Dim. | 3 | Cl. st. | nw. | Falling | 5:00 p. m., 9th | 9:50 a. m., 11th. | |
| | 12 | R. | Dim. | 5 | A. cu. | nw. | | | | |
| | 24 | R. | Dim. | 6 | Cl. st. | w. | Stationary | 11:05 a. m., 11th | D. N. a., 13th. | |
| | 24 | R, O, Y, G, B. | Dim. | 7 | Cl. st. | sw. | Falling | 5:55 p. m., 22d | 3:00 a. m., 25th. | |
| | 25 | R, O, Y, G, B. | Brilliant. | 3 | Cl. cu. | w. | Rising | 9:15 a. m., 25th | 10:25 a. m., 28th. | |
| | 26 | R, B. | Dim. | 10 | Cl. st. | nw. | Falling | 9:15 a. m., 25th | 10:25 a. m., 28th. | |
| | 26 | W. | Bright. | 4 | Cl. st. | nw. | Rising | | | |
| | 27 | R, O, Y, G, B. | Dim. | 8 | Cl. st. | w. | Falling | 9:15 a. m., 25th | 10:25 a. m., 28th. | |
| | 5 | O, Y, B. | Dim. | 6 | Cl. st. | nw. | | | | |
| | 5 | R, O, Y, B. | Bright. | 1 | Cu. | w. | Rising | 3:20 p. m., 4th | 3:41 p. m., 5th. | |
| | 5 | R, O, Y, B, V. | Dim. | | | | | | | |
| | 5 | W. | Dim. | 1 | Cl. st. | e. | Rising | 4:20 p. m., 5th | D. N. p., 5th. | |
| | 6 | O. | Dim. | 7 | A. st. | e. | Falling | P. N. a., 6th | D. N. p., 7th. | |
| | 6 | W. | Dim. | 7 | Cl. st. | w. | Rising | | | |
| | 7 | R, O, G. | Dim. | 9 | A. st. | w. | Falling | D. N. a., 6th | D. N. p., 7th. | |
| | 9 | O. | Dim. | 7 | A. st. | sw. | Falling | 2:50 p. m., 9th | 4:06 p. m., 9th. | |
| | 13 | R, O. | Bright. | 1 | Cl. cu. | nw. | | | | |
| | 13 | W. | Dim. | 3 | St. cu. | s. | Falling | D. N. a., 13th | D. N. p., 13th. | |
| | York N. Y. | 16 | R, O, Y, G, B. | Bright. | 7 | Cl. st. | s. | Rising | 10:15 a. m., 16th | 7:58 p. m., 18th. |
| | | 17 | O. | Dim. | 2 | St. cu. | sw. | | | |
| | | 17 | R, B. | Dim. | 4 | Cl. st. | s. | Rising | 10:15 a. m., 16th | 7:58 p. m., 18th. |
| | | 17 | R, B. | Dim. | Few | Cl. st. | nw. | Rising | | |
| | | 18 | O. | Dim. | 9 | St. cu. | sw. | Rising | 10:15 a. m., 16th | 7:58 p. m., 18th. |
| | | 19 | O. | Dim. | 8 | A. st. | sw. | | | |
| 21 | | W. | Dim. | 2 | St. cu. | e. | Falling | 11:50 a. m., 19th | D. N. p., 21st. | |
| 21 | | W. | Dim. | 1 | Cl. st. | nw. | Falling | 11:50 a. m., 19th | D. N. p., 21st. | |
| 26 | | W. | Dim. | 6 | A. cu. | nw. | Rising | 9:50 a. m., 26th | D. N. a., 27th. | |
| 28 | | R, Y, B. | Dim. | 3 | Cl. st. | nw. | | | | |
| 28 | | W. | Dim. | 6 | St. cu. | w. | Rising | D. N. a., 28th | 7:21 p. m., 28th. | |
| 28 | | R, O, Y, G, B, V. | Brilliant. | | | | | | | |
| 7 | | W. | Brilliant. | 3 | Cl. st. | w. | Stationary | D. N. p., 6th | 4:00 a. m., 8th. | |
| 7 | | W. | Brilliant. | | | | | | | |
| 7 | | W. | Brilliant. | | | | | | | |
| 7 | | W. | Dim. | | | | | | | |
| 11 | | R. | Bright. | 3 | Cl. st. | w. | Falling | 3:00 p. m., 10th | D. N. p., 11th. | |
| 11 | | W. | Bright. | 4 | Cl. cu. | w. | | | | |
| 13 | | O. | Dim. | 2 | Cl. st. | w. | Falling | D. N. p., 11th | 7:15 p. m., 13th. | |
| 19 | | W. | Bright. | 8 | Cl. cu. | w. | Rising | 9:30 a. m., 18th | D. N. p., 20th. | |
| 20 | | R. | Dim. | 10 | Cl. st. | w. | Stationary | 9:30 a. m., 18th | D. N. p., 20th. | |
| 24 | | R. | Bright. | 2 | Cl. cu. | wnw. | Rising | 2:00 p. m., 23d | 1:00 p. m., 25th. | |
| 28 | | R. | Brilliant. | 8 | Cl. st. | sw. | Falling | 2:00 p. m., 27th | 9:00 p. m., 28th. | |
| | | | | 2 | St. cu. | s. | | | | |

* Aerological station.

† Beginning with part nearest sun or moon: R, red; O, orange, etc.

NOTES.

A very unusual and interesting halo was observed at Canton, N. Y., on February 27, 1919. Mr. J. S. Hazen, Observer, states that "this phenomenon was studied carefully and measurements were made as accurately as possible by means of a nephoscope. The colors were vivid, especially the green, which was a bright light green; the red and orange were less brilliant. The clouds consisted of an approaching bank of A. St. low down on the horizon, with some Ci. and Ci. St. and some that were classed as 'false' Ci. The 'false' type apparently gave the green color. The colors were arranged as in halos with the red nearest the sun. The width of the halo was between 2° and 3° . The light pillar, which occurred at the same time, was about one-half a degree in width and was colored dull orange merging into red."

The halo, as measured, has a radius of about 16° . Similar occurrences are noted by Besson in "Different Forms of Halos," p. 23. In 1839 a halo of 14° and coincidentally one of 16° , were seen by Heiden; in 1900 one of 17° was seen by Besson and Duthiel; and in 1899 and

1905 one of $17^{\circ} 55'$ was seen by Hissink, also one of the same radius was later observed by Kr mar.

Attention is called to the halo observed at Royal Center, Ind., on February 25, 1919. Mr. R. E. Frushour, Assistant Observer, states that "this phenomenon became visible as the patch of Ci. Cu. passed over the sun. It was very much like a halo, except that there was no distinct outline, it being wider at some places than at others. The colors were very brilliant and in regular halo order. The red was probably 5° from the sun and the blue probably 9° , although, its duration being so brief, it was impossible to get very accurate readings." Besson notes that a halo of 7° - 8° was seen by Arctowski in 1898 and by Hissing in 1899.

Mr. Milroy N. Stewart, Cooperative Observer at York, N. Y., reports concerning the observation on February 7, 1919, that "the elliptical form of this halo was very apparent, even to the unaided eye. The upper and lower arcs for about 45° were much brighter than the sides. There was absolutely no hint of a circular halo with enveloping arcs: only one ring was visible."