

Duluth, Minn.; Cresco, Iowa; Cornish and Gardiner, Me.; Newport, Vt.; Waupaca, Wis. 11th, La Crosse, Wis.; Cresco, Iowa; Gardiner, Me. 13th, Eastport, Me. 16th, Dodge City, Kan. 17th, Duluth, Minn.; Malone, N. Y.; Gardiner, Me. 18th, Austin, Texas. 19th, Auburn, N. H. 21st, Escanaba, Mich. 23d, Egypt, Penn. At Attaway Hill, N. C., from 10 p. m. of the 22d to sunrise of the 23d, a peculiar reddish glow was observed in the northeast. At Carthage, Ohio, shortly after the passage of the great meteor, on the evening of the 21st, the observer noticed a reddish glow in the northeast which lasted a few minutes.

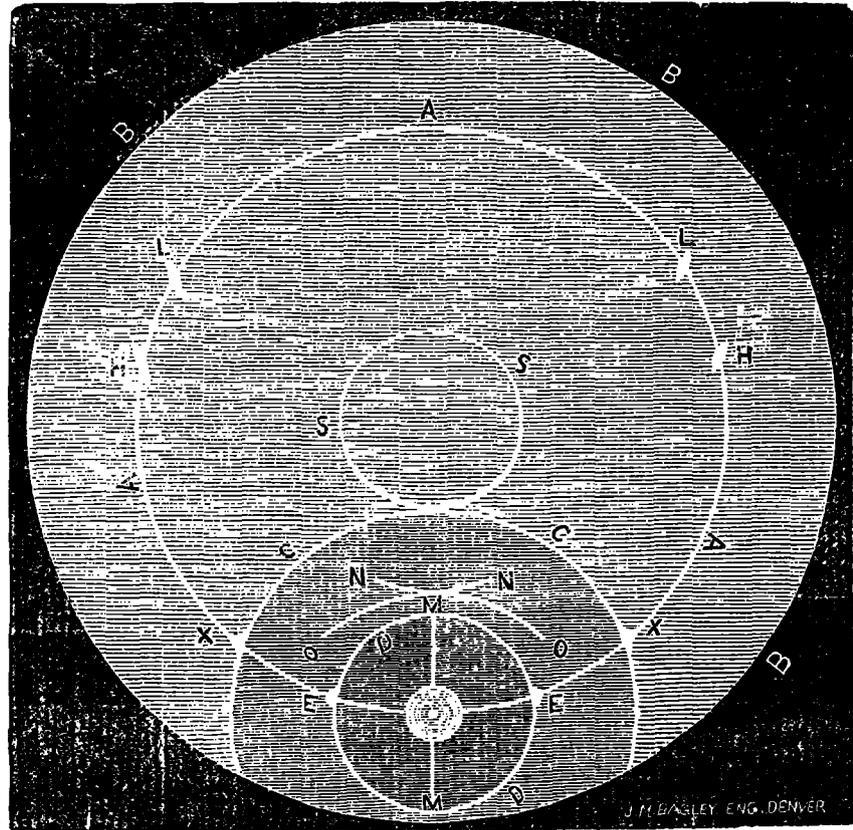
Telegraphic Ground Currents.—The observer at Detroit reports that, in connection with the great storm of the 16th, the operators of the Western Union Telegraph Company worked the lines without a battery, during a portion of the night of the 15th and 16th. At this time clear weather, low temperature and north-west gales prevailed immediately west of Detroit, while southwesterly winds, warmer, cloudy and snowy weather prevailed to the eastward.

OPTICAL PHENOMENA.

Solar Halos were noted as follows: 1st, Ill., Mich., N. Y., Wis. 2nd, Del., Iowa, Me., N. Y. 3rd, Me., N. H. 4th, Ill., D. C., Tenn. 5th, Miss., N. Y., Texas. 6th, Iowa, Neb., Tenn. 7th, Ill., Ind., Ky., Mass., N. Y., Ohio, Tenn. 8th, Dak., Ind., N. Y., Ohio, Penn. 9th, Ill., Ind., Iowa, Kan., Ky., Mich., Ohio, Penn., Tenn. 10th, Dak., Mich., Minn., N. H., N. Y., Penn. 11th, N. Y. 12th, Minn., N. Y. 13th, N. H., N. Y., Ohio, Tenn. 14th, Ind. Ty., Iowa, Minn., N. J., N. Y., Ohio. 15th, Miss. 16th, Ill., Ind., Iowa, Mass., Tenn., Wis. 17th, Dak., Md., N. Y., Wis. 18th, Minn., Tenn., Wis. 19th, Minn., Neb., Ohio, Penn., Tenn. 20th, Ill., Iowa, Mass., Ohio. 21st, Ill., Iowa, Mich., N. Y., Ohio, S. C. 22nd, Kan., Texas, Wis. 23rd, Col., Iowa, Minn., Neb., N. J., Wis., Wy. 24th, Dak., Ill., Kan., Mich., Minn., N. J., N. Y. 25th, N. H., N. Y. 26th, Iowa, Kan., Neb. 27th, Iowa, Kan., Minn., Neb. 28th, Dak., Mass., Neb., N. H., N. Y., Penn., Wis. 29th, Iowa, Mo., Neb. 30th, Ill., Iowa, Minn. 31st, Minn.

A very interesting solar halo was observed at Denver, during the 23d, it consisted essentially of two concentric circles, (DD and CC,) surrounding the sun of 22° and 46° radii respectively; two other concentric circles, (SS and AA,) around the zenith whose radii varied with the altitude of the sun, but were at

midday respectively about 15° and 60°. (SS and CC were tangent to each other;) there were also segments (OO and NN) of circles, centered respectively at the sun and zenith and tangent to each other, these circles had the same radii, namely, about 30°; there was also a well defined vertical column (MM) extending through the sun as a diameter to the circle (CC.) At the intersections of all these circles the mock suns or sun dogs were seen, and also at other points (L, L, H, H) to the number of eight in all. The whole display steadily increased in brilliancy, from sunrise until 9:40 a. m.; it continued at its maximum brilliancy until 11:50 a. m., and was still beautiful at 2 p. m. That portion of the zenithal circle (SS) which lay nearest the sun, was a strikingly brilliant rainbow, the red being nearest the sun, and all its glowing colors were very clearly defined. The spectacle was the admiration of the entire population. The solar halo



observed on the 10th, at Pembina, between 7 and 9 a. m., seems to have been of nearly equal brilliancy. The circles (DD, CC and AA) and the rainbow segment of (SS) and the vertical column, (MM) and four of the attending mock suns were well seen.

Lunar Halos were noted as follows: 1st, Ala., Dak., D. C., Iowa, Me., Md., Mich., N. J., N. Y., Ohio, 2nd, Ala., Conn., D. C., Ill., Ind., Iowa, Md., Minn., N. H., N. J., N. Y., N. C., Ohio, R. I., Tenn., Wis. 3rd, Iowa, Me., N. C., Tenn. 4th, Cal., Del., Me., N. J., Ohio. 5th, D. C., Tenn., Wis. 7th, D. C., Fla., Ill., Ind., Neb., Ohio, Vt. 8th, D. C. 9th, Ohio. 10th, D. C. 12th, N. J. 14th, Minn. 19th, Dak., Ind. 20th, Ga., Kan., Mo., N. J., N. Y., W. Va., Va. 21st, Fla. Ill., Iowa, Kan., Me., N. Y., N. C., Ohio. 22nd, Ala., Ark., Ga., Iowa, Kann., Miss., Neb., Ohio, Tenn., Texas, Wis. 23rd, Conn., Dak., Del., D. C., Iowa, Md., Mass., Minn., Neb., N. J., Ohio, Penn., Utah, Va. 24th, Conn., Dak., Iowa, Mass., Mich., Minn., N. J., N. Y., R. I., Texas. 25th, Ind., Minn., Neb., W. Va. 26th, Col., Iowa, Md., Neb., Texas, Va. 27th, Col., Del., D. C., Iowa, Md., Neb., N. J., N. C., Penn., Tenn., Va., Wis. 28th, Dak., D. C., Ind., Iowa, Me., Mass., Neb., N. H., N. J., N. Y., R. I., Vt., Wis. 29th, Col., Dak., Ind., Iowa, Kan., Mich., Neb., Tenn. 30th, Al., Ill., Ind., Iowa, Kan., Me., Mass., Minn., Neb., N. Y., Penn., Tenn., Wis. 31st, Ga., Ill., Ind., Iowa, Minn., Mich., N. Y., Ohio, Penn., Tenn., W. Va.

Mirage.—3rd, Breckenridge, Minn. 4th, 26th and 27th, Great Bend, Kan. 11th and 13th, Tybee Island, Ga.

MISCELLANEOUS PHENOMENA.

Polar Bands were observed as follows: 1st, Breckenridge, Minn. 4th, Detroit, Mich.; Duluth, Minn. 5th, Duluth, Minn.; Dubuque, Iowa. 6th, Iowa City, Iowa; Carthage, Ohio; Plattsmouth, Neb. 7th, Guttenburg, Iowa. 8th, Auburn, N. H. 10th, Eastport Me. 11th, Tybee Island, Ga. 13th, Carthage, Ohio; Wytheville, Va. 14th, Danville, Ky.; Carthage, Ohio. 15th, Frechold, N. J.; Carthage, Ohio. 16th, Tabor, Iowa; Carthage, Ohio. 17th, Gardiner, Me. 19th, Dubuque, Iowa. 21st, Danville, Ky.; Wytheville, Va.; Tybee Island, Ga. 22nd, Iowa City, Iowa. 23rd, Danville, Ky.; Carthage, Ohio. 25th, Gardiner, Me. 27th, Wytheville, Va. 28th, Iowa City, Iowa; Auburn, N. H. 29th, Iowa City, Iowa. 30th, Iowa City, Iowa. 31st, Wytheville, Va.; Tybee Island, Ga.

Zoological.—*Wild geese* were seen, at Nashville, flying S. 17th; St. Louis, Mo., N. 21st; Laconia, Ind., S. and SE. 20th and 21st; Creswell, Kan., NE. 7th; Fall River Mass., SW. 8th. *Wild ducks* were seen at Laconia, Ind., flying S. and SE. 20th and 21st. *Sparrows* were seen at Baltimore, Md., 4th. *Crows* were seen, at Baltimore, Md., flying S. 30th and 31st.

Prairie Fires.—4th, Pike's Peak; 6th and 8th, Creswell, Kan.; 12th, Fort Gibson, Ind. Ty.; 13th, Fort Randall, Dak.; 15th and 18th, Oregon, Mo.

Zodiacal Light.—8th, Oregon, Mo.; 13th, 14th, 16th and 18th, Bellfontaine, Ohio; 16th, Nashville, Tenn.

Earthquake.—A slight shock was felt in the west end of the city of Charleston on the evening of the 12th, windows rattled and the usual evidences of such convulsions were plainly felt. Wytheville, Va., an earthquake shock, 10:30 a. m., 21st, is reported.

Meteors.—1st, Penn., Texas. 2nd, Texas. 4th, Ill., Ohio. 5th, N. J., Penn. 6th, Ill., N. Y., Penn. 7th, Iowa, Md., N. Y. 8th, Ky., Mich. 9th, Md. 10th, Ill., Iowa, Mo. 11th, Iowa, Kan., Mo. 12th, Ga., Mo., W. Va., Wis. 13th, Iowa, Mo. 14th, N. C., Ohio. 15th, Kan., N. Y., Vt. 16th, D. C. 17th, Cal. 18th, Ill., N. C., Texas. 19th, Texas. 20th, Kan. 21st, Ill., Ind., Iowa, Kann., Minn., Mo., Neb., Ohio, W. Va. 22nd, Kan. 24th, Texas. 30th, Penn. 31st, Fla., Texas.

The great meteor of the evening of the 21st was one of the most remarkable that has lately been recorded in the United States; reports concerning it have been received from about 120 stations. From a brief study of these it becomes apparent that the meteor entered the earth's atmosphere somewhere over or west of Kansas or Nebraska, its true course was nearly due east, and it was last seen over the State of New York. Its visible track, as projected upon the earth, is therefore over a thousand miles long. The times of its appearance and disappearance, as noted by the observers, are extremely discordant. The average of about 45 observations, pretty uniformly distributed along its course, gives 9h. 26min. as the Washington mean time, which may, therefore, represent the moment when it was at the middle of its visible path. No definite conclusion can be satisfactorily arrived at, with reference to its actual velocity in miles, from a comparison of the records of distant observers; but the observations of the individual observers, taken by themselves, give velocities relative to the earth's surface of between 1 and 5 miles per second, or 2 to 5 miles relative to the earth's centre, and as the meteor was overtaking the earth in its annual orbit, its velocity in space relative to the sun was 20 to 25 miles, its movement being towards a point in lat. 20°, long. 35°, with reference to the plane of ecliptic. When first seen the meteor appeared to be as large as the moon, but much brighter. In passing over Indiana its main body divided into two portions, and one of these subsequently broke into a hundred fragments, which at first kept together in one cluster, but gradually fell behind each other, forming a long train in single-file and as such passed over Ohio into New York. The brightness of the meteor was everywhere described as far surpassing bright moonlight. No reliable accounts speak of any noise heard during the visibility of the meteor, but in from two to five minutes after its passage a shock resembling thunder was heard, which in the majority of cases was described as tremend-