

Eagle Pass, Tex., 28th; Cape Lookout, N. C., 29th, instruments had to be cut out; Chattanooga, Tenn., 11th, electricity entered telegraph office, passed two arresters with loud explosion.

OPTICAL PHENOMENA.

Solar Halos.—1st, N. Y., N. H., Ga., Or.; 2nd, Conn., Dak., Ia., Mass., Mich., N. H., N. Y., Ga.; 3rd, Mass., Wis.; 4th, Ia., Mich., Mo.; 5th, N. J., Mich., Ga., Or.; 7th, Ohio, Mich., Ga., Or.; 8th, Ohio, Ga.; 9th, Ohio; 10th, Ga.; 11th, Miss., Ohio, Ill., N. Y.; 12th, La., Miss., Mich., Ohio, Ind.; 13th, Conn., Dak., Ia., Ohio, W. Va., Ind., Mo., N. H., N. Y., N. C., Or.; 14th, Neb., Dak., Minn., N. H., Me.; 15th, Ohio, Ill., Pa., Vt.; 16th, Cal., Conn., Utah., Minn., Ohio, Md., N. J., Va., Or.; 17th, Cal.; 18th, Conn., Mass.; 19th, Mich., Neb., Or.; 20th, Conn., N. Y., Kan., Mich., N. J., Cal.; 21st, Utah, Wis.; 22nd, Utah, Ill., Me., Mass., N. H., N. Y., Vt.; 23rd, Kan., Dak., Ia., Ind., Mich.; 24th, Conn., Dak., Fla., Mo., Ill., Ia., Mass., N. H., N. J., N. Y., Vt., Ga.; 25th, Dak., Ia., Mo., Ohio, Ill., Ind., Ga.; 26th, Utah, N. J., N. Y., N. C., Conn.; 27th, Dak., Ill., Ohio, S. C.; 28th, Ohio, Ind., Mich.; 29th, Ia., Kan., Or.; 30th, Col., Md., N. J., N. C., Cal.; 31st, Utah, Ohio., Ind., Mich., N. J.

Lunar Halos.—1st, Utah, Nev., Wis., Minn., Mich., N. J. 2nd, N. M., Neb., Mich., N. Y., Ia., Mass., N. H., Vt. 3rd, Utah, Idaho, Neb., Ind. Ty., Tex., Dak., Mo., Wis., Mich., N. Y., Ia., Kan., Mass., Mo., Vt. 4th, Ala., Tex., La., Ia., Mo., Minn., N. Y., Ohio, Tenn., Ill., Ind., Kan., Me., Mass., N. J., Va., Vt., Ga. 5th, Cal., Neb., N. Y., Ohio, Ind., Kan., Mo., N. J., Pa., Ga., N. C., Va., Conn. 6th, Col., Dak., Wis., Mich., Ohio, Pa., W. Va., Ia., Me., Mo., Vt., Or. 7th, Col., Dak., Tex., N. Y. 8th, Col., N. Y., W. Va., Mich., Ga. 9th, Wis., N. J. 10th, Ga., Md. 11th, Mich., Ind. 12th, Tenn., Me. 13th, Vt. 14th, Tenn., N. Y. 16th, Idaho, Wis. 17th, Neb. 20th, Wis. 23rd, Utah. 25th, Miss. 26th, Tex., Ia., Mass., Conn. 27th, Ia., Ind., Ohio, Ga. 28th, Dak., W. Va., Mo., N. J., N. Y., N. C., Va., N. H. 29th, Idaho, Dak., Ohio, N. C., Or. 30th, Conn., N. M., Col., Kan., Mass., Mo., N. J., N. Y., Ga., Va., N. H. 31st, Kan., Tex., Ohio, Ind., Mo., N. J.

Mirage.—Olivet, Dak., 1st, 4th, 26th, 30th; Pembina, Dak., 24th; Breckenridge, Minn., 1st, 2nd; Lynn, Mass, 6th.

MISCELLANEOUS PHENOMENA.

BOTANICAL.—*Alabama*—Green Springs, in bloom, 10th, dogwood, 15th, sassafras, 17th, red buckeye and yellow jessamine, 18th, fish poison, 28th, calycanthus, 29th, sweet gum. *Arkansas*—Mt. Ida, in bloom, 6th, peach and plum, 15th, apple and pear, 22nd, quince, 20th, dogwood and red oak. *Colorado*—Georgetown, 15th, few miles below station trees in bloom and in leaf, grass three inches high. *Dakota*—Olivet, 6th, sowing wheat; 8th to 12th, plowing. *Florida*—Houston, 10th, corn planting begun; 31st, cotton planting commenced, Milton, all peach trees in full bloom; 6th, oak trees in blossom; 17th, small figs on trees, stalks of Irish potatoes one foot high; 31st, roses and other hardy flowers in full bloom. *Georgia*—Forsyth, 31st, vegetation ten to fifteen days earlier than for many years, corn planting begun. Augusta, in bloom, 5th, wistaria, 6th, plum, 18th, jonquils; 8th, tree buds swelling; 11th, Irish potatoes sprouting, trees leafing; 22nd, asparagus, beets and English peas in market. *Illinois*—Riley, 10th, some farmers sowing wheat. Anna, in bloom, 26th, peach. *Indiana*—Vevay, Prof. Chas. G. Boernr reports as the result of a series of fourteen years observations (in the same exposure) upon the first flowering of the "Crocus," that "the earliest opening of the flower occurred on February 18th, 1877, and the latest on March 19th, 1870, being a difference of four weeks in the extremes." New Corydon, 31st, wheat, winter barley, rye and clover are in a very good condition, orchards and vineyards have not suffered by cold, pear trees will be covered with blossoms. St. Meinrad, in bloom, 9th, crocus and tulip. *Indian Territory*—Ft. Gibson, in bloom, 9th, wild plum, 10th, peach, plum, cherry and apple, 11th, wild daises and red bud, 13th, jonquils, tulips and hyacinths, 27th, forest trees leafing. *Iowa*—Vail, 10th, spring work commenced, sowing grain and plowing. Keokuk, 8th, trees budding. Dubuque, in bloom, 10th, maple, six days earlier than for thirty years. *Kansas*—Holton, in bloom, 9th, elm; 31st, most fruit thought to be killed, forest trees leafing. *Maryland*—Woodstock, 10th, grass in sheltered places beginning to grow, swamp willow budding; 22nd, white maple budding. *Massachusetts*—New Bedford, 11th, in bloom, snow-drop and crocus. Fall River, in bloom, 7th, snow-drop. Waltham, 31st, buds of poplar and willow swelling. *Michigan*—Northport, in bloom, 20th, polyanthus. *Missouri*—Oregon, sprouting, 6th, tulips, 9th, dandelions, 22nd, hops; in bloom, 7th elm, 8th, red maple, 29th, crocus. *Mississippi*—Brookhaven, 25th, second crop of strawberries ripening; 31st, finished planting corn and sugar cane, acreage of latter very large for this section, oat crop looks well, fruit crop very promising. *Nebraska*—Howard, 31st, peach trees reported killed throughout the county. *Nevada*—Winnemucca, in bloom, 21st, apricot and other fruit trees twelve miles south of station; Boise City, in bloom, 2nd, yellow jessamine, 28th, apricot, 31st, peach; 1st, blackberries frozen. *New Jersey*—Atco, in bloom, 27th, moss vine. *New York*—Flushing, in bloom, 30th, yellow tulip. *New Mexico*—Santa Fé, in bloom, 27th, apricot, plum and peach, much earlier than usual. *North Carolina*—Weldon, plums, 17th, peach, 23rd, white mulberry; in bloom, 23rd, peach and plum; leafing, 23rd, maple and weeping willow. Murphy, in bloom, 31st, peach, pear and plum. Fayetteville, 31st, wheat and oats in fine condition, fruit uninjured. *Ohio*—Ruggles, 31st, wheat very poor, badly winter killed: Jacksonburg, 8th, winter wheat and barley very promising. *Oregon*—Portland, in bloom, 22nd, peach, 30th, plum. *Tennessee*—McMinnville, in bloom, 1st, iris, 3rd, maple, 8th, wild flowers, 9th, spirea and peach, 21st, plum. Knoxville, in bloom, 11th, peach. Chattanooga, in bloom, 1st, japonicas and hyacinths, 10th, peach, 12th, pear, 26th, apple and cherry. *Texas*—Melissa, in bloom, 5th, wild flowers, some corn planted.

Clarksville, 31st, corn planting nearly finished, cotton planting will soon commence, oats and barley look well, very little wheat in the county, fruit crop promises to be very abundant. Pilot Point, in bloom, 2nd, peach and plum. Mason, in bloom, 26th, hawthorn. Uvalde, in bloom, 25th, china trees; 9th, trees in full leaf. *Utah*—Fort Douglass, in bloom, 18th, apricot. *Virginia*—Wytheville, in bloom, 9th, forsythia and crocus; leafing, 8th, gooseberry, 11th, lilac; budding, 8th, aspen. Dover Mines, in bloom, 1st, alder, 5th, maple, 10th, aspen, 17th, apricot, 28th, peach, 29th, cherry; 31st, vegetation very backward. Johnstown, in bloom, 10th, crocus. *West Virginia*—Morgantown, in bloom, 8th, lilac and red maple, 10th, gooseberry. *Vermont*—East Middlebury, 28th, sugar making commenced, and trees yielding finely.

BIRDS.—*Robins*—New Corydon, Ind., 8th; Belvidere, Ill., 8th; Afton, Ia., 9th; Vail, Ia., 7th; Holton, Kan., 7th; Woodstock, Md., 4th; Fallston, Md., 21st; Waltham, Mass., 10th; Somerset, Mass., 1st; Ft. Adams, R. I., 23rd; Southington, Conn., 1st; Highland, Ill., 4th, 5th; Emory Grove, Md., 21st to 30th; New Bedford, Mass., 10th; Fall River, Mass., 11th; Springfield, Mass., 9th; Westborough, Mass., 10th; Northport, Mich., 10th; Litchfield, Mich., 1st; Detroit, Mich., 11th; Fayette, Miss., 25th; Nirvana, Mich., 28th, 29th, 31st; Thornville, Mich., 7th; Corning, Mo., 23rd, 24th, 25th; Oregon, Mo., 1st, 7th; Dunbarton, N. H., 14th; Vineland, N. J., 29th; Princeton, N. J., 9th; Starkey, N. Y., 11th; Waterburg, N. Y., 13th; North Volney, N. Y., 14th; Penn Yan, N. Y., 9th; Bellefontaine, Ohio, 8th; Bethel, Ohio, 6th; Margaretta, Ohio, 9th; Cincinnati, 8th; North Lewisburg, Ohio, 10th; Tioga, Penn., 11th; Catawissa, Pa., 11th; Litchfield, Pa., 21st; Woodstock, Vt., 29th; Keswick, Va., 31st; Bloomfield, Wis., 7th; Embarrass, Wis., 28th, 29th; Wautoma, Wis., 12th; Manitowoc, Wis., 28th; Keokuk, 8th; Madison, Wis., 8th; Columbus, Ohio, 19th; Albany, 11th; Philadelphia, 11th; St. Albans, Vt., 28th; Contoocookville, N. H., 11th; Boonsboro, Ia., 19th; New Westminster, B. C., 11th. *Geese*—Mystic, Conn., 13th, 14th, 30th; Elmira, Ill., 7th; Riley, Ill., 8th; New Corydon, Ind., 6th, 26th; Mt. Sterling, Ill., 7th; Belvidere, Ill., 8th; Afton, Ia., 6th; Ft. Madison, Ia., 6th; Somerset, Mass., 24th; Ft. Adams, R. I., 13th; St. Meinrad, Ind., 18th; Independence, Kan., 7th, 8th, 26th; Emory Grove, Md., 12th, 24th, 27th, 29th; New Bedford, Mass., 17th, 24th, 25th; Springfield, Mass., 30th; Oregon, Mo., 5th, 6th; Corning, Mo., throughout month; Kansas City, Mo., 30th; Plattsmouth, Neb., 17th; Emerson, Neb., 3rd; Genoa, Neb., 7th; Starkey, N. Y., 18th, 25th; Penn Yan, N. Y., 27th; Fayetteville, N. C., 5th; Bellefontaine, Ohio, 11th; Margaretta, Ohio, 9th; North Lewisburg, Ohio, 22nd; Westchester, Pa., 17th; Catawissa, Pa., 11th, 16th, 29th; Melissa, Tex., 5th; Johnsonsboro, Va., 13th; Wautoma, Wis., 10th; Colorado Springs, Col., 26th; North Platte, Neb., 5th; Omaha, 11th; Ft. Gibson, 16th; Bismarck, 30th; Yaukton, 2nd, 8th, 14th; Corsicana, Tex., 7th; 24th, 25th; Davenport, 30th; St. Louis, 3rd; Breckenridge, 28th, 29th; Madison, Wis., 8th; Morgantown, 8th; Cairo, 5th, 6th, 7th; Burlington, Vt., 21st; Portland, Or., 7th, 31st; Red Bluff, Cal., 31st; Boonsboro, Ia., 4th, 6th, 7th, 8th. *Crows*—New Corydon, Ind., 6th; St. Meinrad, Ind., 6th; Independence, Kan., 26th; Rowe, Mass., 10th, 11th, 12th, 13th; Northport, Mich., 13th; Corning, Mo., throughout month; Genoa, Neb., 7th; Bellefontaine, Ohio, 9th; Bethel, Ohio, 6th; Embarrass, Wis., 9th; Wautoma, Wis., 11th. *Ducks*—New Corydon, Ind., 6th; Cresco, Ia., 11th; Vail, Ia., 7th; Ft. Hale, Dak., 27th; Emory Grove, Md., 7th, 9th, 15th, 23rd; Oregon, Mo., 5th, 6th; Nirvana, Mich., 26th; Corning, Mo., throughout month; Plattsmouth, Neb., 17th; Emerson, Neb., 4th; Genoa, Neb., 7th; Cape Vincent, N. Y., 11th; Jacksonburg, Ohio, 1st; North Platte, Neb., 5th; St. Marks, Fla., 10th; Davenport, 7th; Pembina, 7th; Dubuque, 6th, 17th, 19th; Madison, Wis., 8th. *Cranes*—Creswell, Kan., 13th; Fayette, Miss., 16th; Nirvana, Mich., 28th, 29th, 31st; Emerson, Neb., 8th; Melissa, Tex., 24th; Ft. Gibson, 2nd. *Bluebirds*—Mt. Sterling, Ill., 5th; Anna, Ill., 4th; Belvidere, Ill., 8th; Afton, Ia., 6th; Ft. Madison, Ia., 6th; Morse, Kan., 5th; Woodstock, Md., 1st; Waltham, Mass., 10th; Somerset, Mass., 1st; Southington, Conn., 7th; Emory Grove, Md., 24th, 26th, 31st; New Bedford, Mass., 23rd, 24th; Fall River, Mass., 10th; Springfield, Mass., 11th; Westborough, Mass., 10th; Rowe, Mass., 11th, 12th; Litchfield, Mich., 3rd; Oregon, Mo., 7th; Nirvana, Mich., 28th, 29th, 31st; Thornville, Mich., 7th; Dunbarton, N. H., 12th; Vineland, N. J., 6th; Linden, N. J., 5th; Princeton, N. J., 4th; North Volney, N. Y., 13th; Penn Yan, N. Y., 9th; Flushing, N. Y., 9th; North Lewisburg, Ohio, 23rd; Tioga, Pa., 11th; Cincinnati, 8th; Catawissa, Pa., 2nd; Litchfield, Pa., 10th; Accotink, Va., 7th; Keokuk, 7th; Madison, Wis., 8th; Columbus, Ohio, 19th; Atlantic City, N. J., 11th; Albany, 10th; Middlebury, Vt., 31st; Contoocookville, N. H., 13th; Boonsboro, Ia., 19th. *Martins*—New Corydon, Ind., 6th; Afton, Ia., 29th; New Market, Md., 24th; Fayette, Miss., 15th; Ashley, Mo., 27th; Weldon, N. C., 28th; Fayetteville, N. C., 15th; Bethel, Ohio, 27th; Jacksonburg, Ohio, 31st; Ringgold, Ohio, 25th; Catawissa, Pa., 28th; Clarksville, Tex., 10th; Melissa, Tex., 5th; Keokuk, 24th; St. Louis, 28th; La Crosse, 30th. *Killdeers*—Afton, Ia., 7th; Belvidere, Ill., 8th; Ft. Madison, Ia., 7th; Topeka, Kan., 6th; Atco, N. J., 5th; Emerson, Neb., 7th; Waterburg, N. Y., 19th; Bellefontaine, Ohio, 8th; Ringgold, Ohio, 25th; Bloomfield, Wis., 7th. *Sniipe*—Riley, Ill., 8th; Vail, Ia., 7th; St. Meinrad, Ind., 8th. *Sparrows*—Waltham, Mass., 11th; Somerset, Mass., 4th; Highland, Ill., 4th, 5th; Emory Grove, Md., 24th to 31st; Detroit, Mich., 11th; Woodstock, Vt., 29th; Embarrass, Wis., 4th; Wautoma, Wis., 22nd. *Mockingbirds*—Brookhaven, Miss., 1st; Keswick, Va., 31st; Ft. Gibson, Ind. Ty., 6th; Uvalde, Tex., 2nd. *Owls*—Emory Grove, Md., 24th, 29th; Oregon, Mo., 1st, 5th. *Snowbirds*—Waltham, Mass., 10th; Oregon, Mo., 1st, 18th. *Swallows*—Somerset, Mass., 5th; Fayette, Miss., 28th; Brookhaven, Miss., 30th; Jacksonburg, Ohio, 31st; Ft. Gibson, 15th; Portland, Or., 12th; New Westminster, B. C., 16th, 22nd. *Blackbirds*—Elmira, Ill., 6th; New Corydon, Ind., 6th, 24th, 25th; Mt. Sterling, Ill., 31st; Ft. Madison, Iowa, 6th; Vail, Iowa, 7th; Fallston, Md., 2nd; Waltham, Mass., 12th; Southington, Conn., 9th; Sandy Springs, Md., 1st; Oregon, Mo., 5th, 6th; Corning, Mo.,

throughout month; Dunbarton, N. H., 14th; Vineland, N. J., 29th; Moorestown, N. J., 4th; Starkey, N. Y., 10th, 14th; Waterburg, N. Y., 26th; Bellefontaine, Ohio, 9th; Bethel, Ohio, 1st; Cincinnati, 2nd; Ringgold, Ohio, 8th; Catawissa, Pa., 11th; Wytheville, Va., 24th; Bloomfield, Wis., 7th; Manitowoc, Wis., 28th; Howard, Neb., 8th.

FISH.—*Herring*—Fall River, Mass., first caught at Westport harbor, last year appeared as early as February 16th. Somerset, Mass., 17th, first caught. *Shad*—Fayetteville, N. C. 4th, first caught. *Smelt*—Somerset, Mass., 10th, first caught. *Bass*—Somerset, Mass., 21st, first caught.

MISCELLANEOUS.—*Frogs piping*—Elmira, Ill., 10th; New Corydon, Ind., 24th; Belvidere, Ill., 9th; Morse, Kan., 5th; Woodstock, Md., 27th; New Market, Md., 10th; Emory Grove, Md., 4th, 8th, 15th, 21st, 30th; Highland, Ill., 7th, 8th; St. Meinrad, Ind., 7th; Creswell, Kan., 8th, 25th; Independence, Kan., 6th; Topeka, Kan., 26th; Vineland, N. J., 25th; Moorestown, N. J., 10th; Linden, N. J., 15th; Starkey, N. Y., 16th; Flushing, N. Y., 30th; Little Mountain, Ohio, 9th, 29th; Bethel, Ohio, 5th; Margaretta, Ohio, 10th; Jacksonburg, Ohio, 10th; Ringgold, Ohio, 8th; North Lewisburg, Ohio, 10th; Catawissa, Pa., 30th; McMinnville, Tenn., 8th; Wytheville, Va., 7th, 8th; Keswick, Va., 4th, 5th; John-sontown, Va., 9th; Accotink, Va., 7th; Dover Mines, Va., 5th; Bloomfield, Wis., 10th; Wautoma, Wis., 28th; Frankford, Mo., 7th; Howard, Neb., 9th; Keokuk, Iowa, 26th; Portland, Or., 12th, 13th. *Mosquitos*—Oregon, Mo., 27th; Fayette, Miss., 31st. *Honey bees*—Emory Grove, Md., 21st, 29th; Keswick, Va., 4th, 5th; Embarrass, Wis., 9th; Keokuk, 7th. *Grasshoppers*—Melissa, Tex., 12th; Corsicana, Tex., 15th, large numbers of young ones. *Butterflies*—Anna, Ill., 5th; Emory Grove, Md., 9th, 12th, 28th; Oregon, Mo., 30th, 31st; Brookhaven, Miss., 1st; Starkey, N. Y., 13th; Melissa, Tex., 12th; Dover Mines, Va., 9th; Uvalde, Tex., 26th; Keokuk, 8th. *Fire flies*—Houston, Fla., 12th, 23rd; Fayette, Miss., 20th; Brookhaven, Miss., 16th. *Wasps*—Brookhaven, Miss., 3rd; Dover Mines, Va., 6th. *House flies*—Independence, Kan., 10th; Oregon, Mo., 7th; Indianola, Tex., 26th; Keokuk, 7th. *Dragon flies*—Fayette, Miss., 21st; Kansas City, Mo., 25th.

Meteors.—Woodstock, Md., 7th, 11th, 12th, 13th, 14th to 25th. Emmittsburg, Md., 16th. Fayette, Miss., 10th, 23rd, 27th. Corning, Mo., 14th, 20th, 30th. Princeton, N. J., 9th, 7:16 p. m., very brilliant meteor; direction south of east; length of visible path about 100°; color, first yellowish, later white, leaving a train of sparks; when brightest exceeded Venus in intensity, resembling a ball from a Roman candle; visible ten or fifteen seconds. Trenton, N. J., 9th, 7:15 p. m., very brilliant meteor; direction, east to west; color, yellow; duration, twenty seconds; trail, bright scarlet. Freehold, N. J., 9th, 12th. Atco, N. J., 11th and 12th. Princeton, N. J., 8th. Waterburg, N. Y., 10th. Jacksonburg, Ohio, 15th, 30th. Hulmesville, Pa., 9th, 7 p. m., large and brilliant meteor passed from SW. to NE.; duration, about four seconds. Wilmington, 31st, 2 a. m., a most brilliant meteor from the NW. exploded when about the zenith; while in motion it emitted a brilliant light, leaving a trail of fire apparently about 50 yards in length.

Polar Bands.—New Corydon, Ind., 8th, 7th, 11th, 13th, 16th, 25th, 28th, 31st; Thornville, Mich., 20th, 21st, 31st; Freehold, N. J., 19th, 26th; Leavenworth, 17th; St. Paul, Minn., 4th; Woodstock, Vt., 8th, 11th, 26th; Wytheville, Va., 5th, 7th, 18th, 20th.

Prairie and Forest Fires.—Ft. Randall, Dak., 3rd, 5th, 6th, 9th, 10th, 11th, 12th, 15th, 19th, 26th, 29th; Ft. Union, N. M., 10th, 14th, 23rd, 26th, 27th, 28th; Mt. Ida, Ark., throughout month; Independence, Ia., 19th; Creswell, Kan., 5th to 15th, 18th, 25th; Independence, Kan., 6th to 16th; De Soto, Neb., throughout month; Genoa, Neb., 21st to 31st; North Platte, 25th, very destructive to ranches and cattle; Dodge City, 12th, 17th, 21st, 22nd to 25th, 27th; Ft. Gibson, 21st, 24th, 25th; Yankton, 8th, 9th, 10th, 28th, 29th, 30th, 31st; from the 28th to 31st, devastated a great part of the Big Sioux valley, destroying over fifty farms, also churches, school-houses and several human lives; Eagle Pass, Tex., 25th; Ft. Davis, Tex., 25th, 26th, 27th, 28th; Corsicana, 24th; Breckenridge, 10th; Madison, Wis., 19th; Chattanooga, Tenn., 5th; Wytheville, Va., 14th, 15th, 16th, 28th; Graham, Tex., 19th, 20th, 22nd, 24th, 25th, 30th; Coleman, Tex., 7th; Punta Rassa, Fla., 6th and 7th.

Earthquakes.—Granada, Nicaragua, C. A., June 9th, 1878, 4:30 p. m., shock from NW. to SE., duration 17 seconds; 17th, 11:15 a. m., slight shock, NW. to SE., 11 seconds. Cerro de Pasco, Peru, June 16th, 1878, two severe shocks; 19th, 1:30 a. m., severe shock. U. S. Flagship "Monongahela," at Yokohama, Japan, reports January 21st, 1879, 2:35 a. m., smart shock, motion in a southerly direction, sharp at first, gradually diminishing and immediately followed by a less violent shock, the whole lasting from 5 to 6 seconds; 27th, 10:50 a. m., another shock, which was much more severe at Tokio. U. S. Naval Hospital, Yokohama, Japan, January 21st, 3:40 a. m., smart shock, duration about 15 seconds; 23rd, a. m., light shock; 26th, 4 p. m., light shock; 27th, 10:47 a. m., smart shock, duration 5 seconds; 28th, 1 a. m., light shock; February 27th, 2:45 a. m., smart shock, duration 45 seconds. San José de Costa Rica, C. A., February 12th, 10:46 p. m., feeble shock; 18th, 3:10 a. m., very feeble shock; 26th, at 6:00, 6:10 and 6:30 a. m., feeble shocks, and at 4:40 p. m., stronger shock. March 18th, 0:17 a. m., strong shock, oscillations from E. to W., lasting 10 seconds; at Alajuela, 0:15 a. m., strong shock of short duration.

Sunsets.—The characteristics of the sky at sunset, as indicative of fair or foul weather for the succeeding twenty-four hours have been observed at all Signal Corps stations. Reports from 123 stations show 3,798 observations to have been made, of which 56 were reported doubtful; of the remainder, 3,021, or 79.5 per cent were followed by the expected weather.

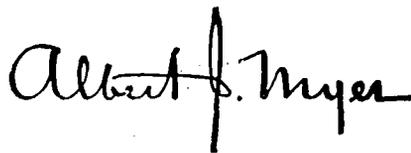
Pollen.—Prof. W. H. Chandler, Lehigh University, South Bethlehem, Penn., writes that during Sunday night, March 16th, there was a slight fall of snow in that section, and on Monday morning, when the snow had melted, a yellow deposit was found covering the ground, more or less; upon examining the deposit, it was found to be the pollen of pine trees. The U. S. Signal Corps observer at New Orleans reports light showers on the 17th, and states that “a peculiar feature of the rain was its yellow color, which was due to large quantities of the pollen of the cyprus tree floating in the atmosphere.” The U. S. Signal Corps observer at Lynchburg, Va., forwarded on the 21st a sample of the yellow deposit which had fallen with the rain during the preceding night; it was transmitted to the Surgeon General, U. S. A., for microscopical examination. Major J. J. Woodward, Surgeon, U. S. A., reports that “the yellow powder which gives it its physical properties consists entirely of the characteristic triple-grained pollen of the pine. The pine woods in the region around Lynchburg had been in blossom, I believe, for some days previous to the 20th, and the direction of the wind at the time should indicate where the pollen came from. Under favorable circumstances, however, the pollen may be carried for long distances, so that its source is not necessarily near the town.”

Sun-spots.—The following record has been forwarded by Prof. S. Newcomb, U. S. Navy, Superintendent Nautical Almanac, Washington, D. C.: observations were taken by Mr. D. P. Todd, assistant, on March 1st, 3rd, 4th, 5th, 7th, 8th, 10th, 11th, 12th, 13th, 15th, 16th, 18th, 19th, 25th, 28th and 31st, but not any spots were seen. Mr. Wm. Dawson, Spiceland, Ind., reports having taken observations on the 1st, 3rd, 4th, 5th, 7th, 8th, 9th, 11th, 12th, 14th, 16th, 17th, 18th, 23rd, 24th, 25th, 27th, 28th, 29th and 31st; not any spots were seen except one small spot on the 14th, one-third of the way from the centre to south edge of the sun. Mr. David Trowbridge, Waterburg, N. Y., examined the sun on the 3rd, 7th to 14th, 16th, 19th and 20th without observing any spots. Prof. Gustavus Hinrichs, Iowa City, Ia., reports having observed on nineteen days, and that the sun was free from spots visible in his telescope. At Ft. Whipple, Va., observations were continued throughout the month without having seen any spots.

New Stations.—Since August, 1878, instructions have been issued establishing stations of the *First Class* as follows: October 15th, 1878, Deadwood, and discontinuing Lead City, Dakota. April 9th, 1879, Springfield, Ill.; 10th, Little Rock, Ark.

The following have been announced as *Display stations*, (for displaying Cautionary Signals,) viz: September, 17th, Gloucester, Mass., and included in *Section Eight*. September 19th, Fall River, Mass., to repeat Newport Signals. September 26th, Port Eads, La., to repeat New Orleans Signals. October, 1st, Stonington, Conn., to repeat New London Signals. October 18th, Fall River, Mass., placed in *Section Eight*. November 1st, Pensacola, Fla., to repeat Mobile Signals. January 21st, 1879, City Island, New York harbor, to repeat New York City Signals. February 6th, Tybee Island, Ga., changed from *First Class*. February 7th, New Buffalo, Mich., discontinued; Muskegon, Mich., placed in *Section Three*.

PUBLISHED BY ORDER OF THE SECRETARY OF WAR.



Brig. Gen. (Bvt. Assg^d.) Chief Signal Officer. U. S. A.

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