# SUBJECT AND AUTHOR INDEX OF THE MONTHLY WEATHER REVIEW, 1909.

The following rules have been observed by Mr. Cleveland Abbe, jr., in preparing this index:

The meteorological elements most important in determining climate, such as temperature and precipitation, are entered under both the element and the locality, but the following are entered only under their respective headings, and not under the locality: Atmospheric electricity, droughts, earthquakes, evaporation, floods, fog, frost, lightning, meteors, optical phenomena, excessive precipitation, radiation, storms of all kinds, temperature of snow, soil, and water. Places in the United States are entered under the name of the State or Territory; in foreign countries, under the country.

If tables of observations contain but two subjects, e. g., pressure and temperature, each is indexed separately under its proper heading. Tables containing more than two subjects are entered but once (in addition to the entry under location), under the general heading "Observations," except that the following are indexed separately wherever they occur: Auroras, drought, evaporation, fog, frost, halos, number of days with precipitation, ozone, radiation, snow, sunshine, temperature of soil and water, thunderstorms, and (under clouds) number of clear, partly cloudy, and cloudy days.

The letters *a*, *b*, *c*, *d*, refer to the 1st, 2d, 3d, and 4th quarters of the page, respectively, and indicate a brief note or reference. The length of any article covering more than one column is given to the nearest whole page. An asterisk (*) preceding a page number shows that not more than a very few lines are devoted to the subject on that page. A dagger (†) indicates that the phenomenon described is especially noteworthy.

The following abbreviations are used: Q., "quoted"; p., "page" or "pages"; ch., "chart" or "charts"; pl., "plate" or "plates"; for the calendar months, Ja., F., Mr., Ap., My., Je., Jl., Ag., S., O., N., D.


A[bbe], C[leveland].
Chinook wind? What is, 131 *d*.
Chronological outline of the history of meteorology in the United States, 7 p., 87, 146, 178, [Addenda] 252 *d*.
Dr. Sereno Bishop. [Obituary notice], *47 *d*.
Dry farming, 53 *d*.
Duststorms in Texas, 16 *b*.
Force of gravity at the earth's surface (O. Hecker q. on), †133 *c*.
Meteorological methods, reform in (remarks on), 132 *b*.
Meteorology as a study for practical men, 134 *b*.
Meteorology at Harvard College observatory, 1 p., 133 *d*.
Monthly Weather Review, changes in, 207 *c*.
Northers of the Sacramento Valley (remarks on), 133 *c*.
Psychrometer: rotated, whirled, ventilated, †23.
Weather words in all languages, 62 *b*.
A[bbe], jr., C[leveland].
Aurora of May 15–16, 1909, 1 p., 156 *c*.
P. P. Calvert.—Map of mean annual temperatures for Mexico and Central America (notice), 66 *a*.
Canadian meteorological service, recent extensions of, 15 *b*.
(Translation by.) Climate of the glacial epoch (H. Arctowsky), 2 p., 26.
(Translation by.) Express all barometric measurements by the ordinary general units of force (W. Koeppen), 1p., 92*d*
Meteorological observatory at Teneriffe, 95 *d*, 191 *b*.
Meteorology in the schools, 109 *c*.
(Translation by). Squalls and thunderstorms (J. Loisel), 3 p., 237.
Tornado in Illinois, 151 *d*.
Tornadoes in Kansas (F., Ap., 1909), *151 *d*.
Missouri, 207 *d*.
Oklahoma, My., 1909, 199 *d*.
Weather Bureau men as educators, 23, 64, 100.
Weather Bureau meteorological charts of the oceans, 110.
Zodiacal light, 253 *a*, *c*.
Abyssinia. Meteorological expedition to, under J. I. Craig, *46 *c*.
Aerial observations. Aerological stations of the world, *10 *d*.
[Explain] Rain with low temperature (A. L. Rotch), 21 *d*.
Highest balloon [ballon-sonde] ascension in North America (A. L. Rotch), 199.
Inversions in the vertical gradient of temperature in the atmosphere, relations of, to areas of heat and cold (H. H. Clayton), 2 p., 191.
Isothermal layer over Africa, 46 *b*.
Summer and winter vertical temperature gradients [in Europe], (W. J. Humphreys), 1 p., 10.
*Belgium. Uccle.* Vertical temperature gradients between 3,000 and 8,000 meters (W. J. Humphreys), 11 *b*, *c*.
*East Africa.* German aerological expedition to (C. F. Talman), 46 *b*.
*France. Trappes.* Vertical temperature gradients between 3,000 and 8,000 meters (W. J. Humphreys), 11 *b*, *c*.
*Germany. Frankfurt a/M.* Observations and weather service at, during Exposition of 1909, 46 *d*.
*Lindenberg.* Vertical temperature gradients between 3,000 and 8,000 meters (W. J. Humphreys), 11 *a*, *c*.
*Strassburg.* Vertical temperature gradients between 3,000 and 8,000 meters (W. J. Humphreys), 11 *a*, *c*.
*Russia. Pavlovsk.* Vertical temperature gradients between 3,000 and 8,000 meters (W. J. Humphreys), 11 *a*, *c*.
*Virginia. Mount Weather.* Great inversions of temperature (A. J. Henry), 1 p., 22.
Aerology. International Commission on, *9 *d*.
Agamennone, [Giovanni]. (Observes an inverted rainbow at Rocca di Papa Observatory, Ap. 9, 1909), 47 *b*.
Agriculture. Dry farming (C. Abbe), 53 *d*.
Dry farming. Some climatic features of Wyoming and their relation to, (W. S. Palmer), 2 p., map, 54.
A[lciatore], H[enry] F. Tornadoes in Arkansas (F., Mr., Ap., 1909), 2p, 154.
Aqueous vapor. Vapor pressure over ice and water, difference, Arrhenius' expression for (q. by C. F. Marvin), 8 *b*.
Vapor pressure formula adopted by Clausius, 8 *a*.
Vapor pressure formula adopted by N. Ekholm, †7 *b*.
Pressure of saturated vapor from water and ice as measured by different authorities (C. F. Marvin), 7 p., ch. XI., Ja., 3.
Pressures of, Battelli's values above 120° C. (q. by Marvin), 6.
Cailletet & Colardeau values above 120° C. (q. by Marvin), 6.
values accepted by Ekholm (q. by Marvin), 7.
adopted by Ekholm (q. by Marvin), 6.
Holborn & Henning values (q. by Marvin), 6.
Juhlin values q. by Ekholm, 6.
as measured by Marvin, 4, 6
Ramsay & Young values above 120°C. (q. by Marvin), 6.
Regnault's values above 120° C. (q. by Marvin), 6.
Regnault-Broch values (q. by Marvin), 6, 7.
Thiesen & Scheel values (q. by Marvin), 6.
Wiebe's values (q. by Marvin), 6.
Archenhold, F[riedrich] S. Photographing the Leonids of November, 1909 [prize for], 199.
Arctowsky, Henryk Climate of the glacial epoch, 2 p., 26.
Argentine Republic. Argentine Weather (H. L. Solyom), 3 p., maps, 96.
Island station at the South Orkneys, annual relief expedition to, 47 *b*.
Armington, John H. The Lake Region—General Features, 1 p., 1036.
Arrhenius, [Svante]. Vapor pressure over ice and water different (q. by C. F. Marvin), 8 *b*.
Associated Bureaus. Invited to contribute to the Monthly Weather Review (W. L. Moore), 833 *a*.
Atmosphere. Transparency of, throughout the world (W. H. Pickering q. on), 1 p., 133 *d*.
Aurora. Aurora of May 15–16, 1909 (R. Niss and A. H. Palmer), 1 p., 156.
Investigations of, by Norwegian Aurora Polaris expedition (K. Birkeland), 2 p., 16.
*Massachusetts. Blue Hill.* My. 15–16, 1909 (A. H. Palmer), 156 *d*.

Ballooning. Meteorology for balloonists, at Cologne, 10 *b*.
Balloons. Sounding. Highest ascent of a sounding balloon in North America, 199.
Bate, H[enry] C. Tornadoes in Tennessee (Ap. 29, 1909), 1 p., †152.
Battelli. Vapor pressure measurements noticed and quoted, 5, 6, 9.
Bauer, J[acob] W. Severe winds in South Carolina, Mr., 1909, *111 *c*.
Bauer, L[ouis] A[gricola]. Terrestrial and cosmical physics, plea for, 2 p., 27.
Beals, E[dward] A. Annual rise of the Columbia River, 1909, 1 p., 223.
Editor, District 12, Columbia Valley. *See* Climatological Summaries.

Belden, W[illiam] S. Tornadoes in Mississippi, F., 1909, 112 *a*; Ap. 29, 1909, *153 *a*.
Bergholz, Paul. Death of, noticed [Ja. 3, 1909], *10 *c*.
Berthelot, D. (Q. on relation between the hydrogen thermometer and the thermodynamic scale,) †5 *d*.
Bibliography. Annotated bibliography of evaporation [continued] (G. J. Livingston), 21 p., 68, 103, 157, 193, 248, [Addenda] 252, [corrigenda] 252 *d*.
Bigelow, Frank Hagar. Important problems in climatology, 4 p., 979.
Studies on the vortices in the atmosphere of the earth.
VI.—The assymetric land cyclone and its system of vortex lines. The concave dumbbell-shaped vortex, 6 p.
Birkeland, K[ristian]. Aurora Polaris. [Summary of report on the Norwegian Aurora Polaris expedition of 1902–1903], 2 p., 16.
Bishop, Dr. Sereno. Obituary notice of (C. Abbe), *47 *d*.
Blair, Thomas A. Northers of the Sacramento Valley, 1 p., 132 *c*.
Börnstein, Richard. *See also* Landolt, H., and R. Börnstein.
Bowie, Edward H. Rivers and Floods. [Monthly Summary], 399.
Boyer, H[arry] B. Tornado at Savannah, Ga., 177.
Brandenburg, Frederick H. Editor, District 9, Colorado Valley. *See* Climatological Summaries.
Broch, O. J. (Vapor pressure measurements noticed and quoted), 3, 6, 9.
Buckingham, Edward. Communication on relation between the hydrogen thermometer and the thermodynamic scales (q. by C. F. Marvin), †5 *d*.
Bunnemeyer, Bernard. Editor, District 8, Texas and Rio Grande Valley. *See* Climatological Summaries.
Report on the Texas hurricane of Jl. 21, 1909, 3 p., 351.
Tornadoes in Texas, F., Mr., 1909, 111 *c*.

Cailletet & Colardeau. Vapor pressure measurements noticed and quoted 5, 6, 9.
California. Precipitation. Excessive local annual falls during 1909,†1116 *d*.
Rainfall of the Hetch Hetchy Valley (A. G. McAdie), 6 p., 1117.
*Hetch Hetchy Valley*. Rainfall of (A. G. McAdie), 6 p., 1117.
*Sacramento Valley*. Northers of (T. A. Blair), 1 p., 132 *c*.
*San Diego*. Climatological exhibit at Seattle, Wash., 1909, 176.
*Tuolumne River* basin. Precipitation over, 1849–1909 (M. Manson), 1120.
Calvert, Philip P. Mean annual temperatures for Mexico and Central America, map of. (Notice), 66 *a*.
Canadian Meteorological Service. Recent extensions of (C. Abbe, jr.; R. F. Stupart), 15 *b*.
Canary Isles. *Teneriffe*. Meteorological observatory on (C. Abbe, jr.), 95 *d*., 191 *b*.
Carpenter, Ford A. Method of advertising climate, 176.
Chaffee, F. P. Tornadoes in Alabama [F., 1909], 111 *b*.
Chappel, George M. Editor, District 5, Upper Mississippi Valley. *See* Climatological Summaries.
Charts. Description of tables and charts (P. C. Day), 1 p., 34.
Chinook. What is the chinook wind (C. Abbe)? 131 *d*.
Clark, W[illiam] F. Tornado at Anniston, Ala. [Ap. 13, 1909], 1 p., *207 *d*.
Clausius. Vapor pressure formula of (q. by C. F. Marvin), 8 *a*.
Clayden, Arthur W. Clouds of Venus and their significance, 4 p., Ch. IX, Ap., 127.
Clayton, Henry Helm. Adopt the Kelvin thermometer scale and the metric system, 92 *a*.
Inversions in the vertical gradient of temperature in the atmosphere, relations of, to areas of heat and cold, 2 p., 191.
Climate. Advertising, a method of (F. A. Carpenter), 176.
*Geological*. Glacial epoch, climate of (H. Arctowsky), 2 p., 26.
Mountain climate, importance of, in the West (E. R. Hodson), 1 p., 949.
*United States*. Condensed Climatological Summary [by sections], (Monthly), 33, 76, 115, 163, 211, 255, 404, 544, 690, 834, 990, 1148.
District Summaries (monthly):
1. North Atlantic States, 267, 412, 552, 698, 842, 998.
2. South Atlantic and East Gulf States, 278, 423, 563, 709, 854, 1011.
3. Ohio Valley, 290, 435, 575, 722, 865, 1023.
4. Lake Region, 301, 446, 586, 734, 877, 1035.
5. Upper Mississippi Valley, 309, 454, 594, 742, 885, 1045.
6. Missouri Valley, 320, 466, 605, 754, 898, 1058.
7. Lower Mississippi Valley, 337, 483, 622, 771, 916, 1076.
8. Texas and the Rio Grande Valley, 351, 497, 638, 785, 932, 1090.
9. The Colorado Valley, 363, 505, 648, 794, 941, 1098.
10. The Great Basin, 372, 513, 657, 802, 949, 1107.
11. California, 378, 519, 665, 810, 956, 1116.
12. Columbia Valley, 386, 527, 673, 818, 964, 1130.
*Wyoming*. Some climatic features of, and their relation to dry farming (W. S. Palmer), 2 p., map, 54.
Climatology. Important problems in (F. H. Bigelow), 4 p., 979.
Cline, Isaac M. Editor, District 7, Lower Mississippi Valley. *See* Climatological Summaries.
Report on the New Orleans hurricane of S. 18–20, 1909, 2 p., 623.
Clouds. Blanket effect of (W. W. Coblentz), 65 *c*.
Clouds of Venus and their significance (A. W. Clayden), 4 p., Ch. IX, Ap., 127.
Clouds—*Continued*.
[The earth as it would appear from Venus], 128 *a*.
[Emissivity of] (W. W. Coblentz), 65 *d*.
Movement. Relation of the movement of high clouds to cyclones in the West Indes (J. T. Quinn), 6 p., 134 *d*.
Coblentz, W. W. Blanket effect of clouds, 65 *c*.
Colardeau. *See also* Cailletet and Colardeau.
Cold Waves. *Cause*. Source of our cold waves (R. F. Stupart), ch. IX, X, Ja., 26 *a*.
Colorado River. Hydrographs for, Je. and Jl., 1909, 364.
Columbia River. Annual rise of, 1909 (E. A. Beals), 1 p., 223.
Conger, N[orman] B. Great Lakes, ice conditions on, during the winter of 1908–09, 2 p., *244 *d*.
Summary of ice conditions of the Great Lakes [F., 1909], 47 *d*.
Cosmical physics. Plea for terrestrial and (L. A. Bauer), 2 p., 27.
Cox, Henry J. Editor, District 4, Lake Region. *See* Climatological Summaries.
Crowell, Lincoln. Effect of exposure and altitude on the distribution of forest types in the Manti National Forest, 803.
Cycles. *See* Periodicity.
Cyclones. Influence of mountains and coasts on [paths] of (D. T. Smith), 64 *c*.
Wind directions in [by movement of high clouds] in West Indies, 6 p., 134 *d*.

Dabney, A. L. Relation between precipitation, run-off, and discharges in the Tallahatchie, [Miss.], drainage district, 2 p., 917.
Day, Preston C. *See also* Weather of the Month (Monthly Summary.)
Description of tables and charts, 1 p., 34.
Weather of the month (Monthly Summary), 30, 73, 112, 161, 209, 253.
Douglass, A[ndrew] E[llicott]. Weather cycles in the growth of big trees [in Arizona], 10 p., *225 *d*.
Durand-Gréville, E. Cited on the nature of squalls and thunderstorms, 237.
Squalls, classification of, q. on, 238 *a*.

Earth pulsation. Barometric pressure and (N. Shimono), †65 *a*.
[Wind and], (N. Shimono), †65 *a*.
Earthquakes. *See also* Earth pulsation.
*California*. [Policy of concealment in regard to], (G. K. Gilbert q. on), †63 *d*.
*Utah*. *Salt Lake City*. [Brief note and seismogram], O. 5, 1909, 659 *a*.
East Africa. Prussian aerological expedition to, results of (C. F. Talman), 46 *b*.
Ekholm, Nils. Pressure of aqueous vapor over water and over ice (review by C. F. Marvin), 7 p., ch. XI, Ja., 3.
Erman, A[dolf]. Transformations of snow crystals, 1 p., 13.
Evaporation. Annotated bibliography of [continued] (G. J. Livingston), 21 p., 68, 103, 157, 193, 248, [Addenda] 252, [corrigenda] 252 *d*.
Formulas for computing (Marvin), 144.
Clapeyron equation (q. by Marvin), 60 *a*.
Importance of the wind-term in (C. F. Marvin), 59 *a*, *b*.
Proposed new formula (C. F. Marvin), 4 p., 57.
[Lines of equal evaporation called "isothymes,"] 142 *d*.
Methods and apparatus for the observation and study of (C. F. Marvin), 15 p., 141, 182.
Exhibits. Exhibit of meteorological data, device for (D. T. Maring), 1 p., 239 *d*.
Expositions. *See* Seattle Exposition.

Fassig, Oliver L[anard]. Average annual rainfall of Porto Rico, W. I., 4 p., maps, 982.
Fath, E. A. Zodiacal light, q. on spectrum of, 253 *a*.
Fechner's Law. *See* Weber's Law.
Finley, J[ohn] P. Meteorological terms used in the Philippines. 62 *c*.
Flammarion, Cammille. The moon blameless, 1 p., 130 *d*.
Floods. Columbia River, My–Jl., 1909, 1 p., 223.
Sacramento River, Cal., 1868, 956 *c*.
San Juan River, Colo., and N. Mex., S., 1909, 1 p., 648.
*Iowa*. Effect of drainage work in northern Iowa on the flood stages of the rivers (A. Marston), 1 p., 1046.
Forecasts. Forecasts and warnings. [Monthly summary], 1, 43, 85, 125, 173, 173, 221, 397, 538, 685, 829, 986, 1143.
*See also* Weather, forecasts, and warnings for the month.
Probabilities, simple application of the theory of, to weather prediction (C. E. Von Orstrand), 1 p., 175 *d*.
Thunderstorms, proposed method for forecasting (Durand–Gréville), 239 *c*.
Forest types. Effects of exposure and altitude in the distribution of, in the Manti National Forest (L. Crowell), 803.
Frankenfield, H[arry] C[rawford]. (Comments on C. E. Van Orstrand's paper proposing a forecast scale of probabilities), 176 *b*.
Rivers and Floods. [Monthly summary], 2, 45, 86, 126, 174, 222, 540, 687, 831 *c*, 988, 1145.
Freeman, W. B. Flood on the San Juan River, September, 1909, 1 p., 648.

Frost. Protection against, by covers (A. G. McAdie), 1 p., 224 *c*.
(Relative efficiency of pots and covers), (A. G. McAdie), 1 p., 224 *c*.
Smudge pot test at Salt Lake City, Utah, S., 1909 (A. H. Thiessen, J. Taylor), 1 p., 658.

Garriott, Edward B. *See also* Weather, forecasts, and warnings for the month.
The Key West, Fla., hurricane of O. 11, 1909, 2 p., maps, 829.
Gheury, M. E. J. Specific gravity of snow, 2 p., *98 *d*.
Suggested reforms in meteorological methods, 1 p., 91.
Gibson, J. B. Formation of hail, †11.
Gilbert, G[rove] K[arl]. [Honesty the best policy], †63 *d*.
Scientific trespass, q. on, 131 *c*.
Glidden, Charles J. Balloon among thunderstorms, 175 *b*.
Gravity. Force of, at the earth's surface (O. Hecker q. on), †133 *c*.
Great Lakes. Lake region, general features (J. H. Armington), 1 p., 1036.
Great Plains. Hot winds on, in summer (I. M. Cline), 1 p., 337.
Gréville. *See* Durand-Gréville.

Hadley, [Arthur Twining]. [Q. on technical training in the United States], 134 *b*.
Hailstones. Formation of (J. B. Gibson), 11 *d*.
Size of, at Atlanta, Ga., O. 14, 1909, 711 *a*.
Hailstorms. *Georgia. Atlanta.* O. 14, 1909, †710 *d*.
Hall, Maxwell. [Furnishes rainfall data from Jamaica], 42, 123, 171, 219, 255, 398, 540, 687, 831, 988. [Annual summary], 1145.
Hammonds, Oscar H. Thunderstorm at Southeast Farallon, Cal., S. 26, 1909, †665 *c*.
Hann, Julius. Celebration of 70th birthday [Mr. 23, 1909], *10 *b*.
Hecker, O. [Force of gravity at the earth's surface, quoted on], †133 *c*.
Heiskell, Henry L. Notice concerning Weather Bureau meteorological charts of the oceans, 110 *c*.
Henry, A[lfred] J[udson]. Great inversions of temperature, 1p., 22.
Henning, F. *See also* Holborn, L. and F. Henning.
Hodson, E. R. Importance of mountain climate in the West, 1 p., 949.
Holborn, L. and F. Henning. (Vapor pressure measurements noticed and quoted), 5, 6, 7, 9.
Honesty the best policy (G. K. Gilbert q. on), †63 *d*.
Horton, E[dgar] C. Destructive storms in Alabama [Ap., My., 1909], 1 p., 208 *c*.
Tornado in Alabama (Ap. 30, 1909), 154 *c*.
Horton, Robert E. Snowfalls and water equivalents in New York [1905–1909], 151.
Humphreys, W[illiam] J[ackson]. Attendance on scientific meetings, 1 p., 56.
Summer and winter vertical temperature gradients, 1 p., 10.
Hurricanes. *Florida. Key West.* The Key West hurricane of O. 11, 1909, (C. F. von Herrmann), 1 p.
(E. B. Garriott), 2 p., 710, 829.
*Texas.* 1909. Report on the Texas hurricane of Jl. 21, 1909 (B. Bunnemeyer), 3 p., 351.
*West Indies.* A., 1909, 538.
S., 1909, 564, 623, 685.
Hydrographs. Colorado and tributaries, Je. and Jl., 1909, 1 p., 364.
Hydrological Journal. Proposed issue of, by the Weather Bureau (F. H. Bigelow), 979 *b*.

Ice. Great Lakes, ice conditions on, during the winter of 1908–1909 (N. B. Conger), 2 p., *244 *d*.
Sleet storm in Ohio, F. 14, 1909, 112 *a*.
Summary of ice conditions on the Great Lakes (N. B. Conger), 47 *d*.
[Weight of sleet on wires, Ohio, F. 14, 1909, 112 *a*.
Instruction in meteorology. Balloonists, instruction in meteorology for, at Cologne, *10 *b*.
Meteorology as a study for pratical men (C. Abbe), 134 *b*.
Meteorology at Colby College (H. E. Simpson), 1 p., 177.
Meteorology in the schools, 109 *c*.
Weather Bureau men as educators, 23, 64, 100.
Instruments. Evaporation. Apparatus for the observation and study of, (C. F. Marvin), 10 p., 182.
Kiosk, Weather Bureau (D. T. Maring), 2 p., 89 *d*.
International commission on daily weather reports for the globe, 10 *a*.
International Commission on Scientific Aeronautics, Monaco session, *9 *d*.
Isothymes. [Lines of equal evaporation], 142 *d*.

Jefferson, M[ark] S. W. Winter aridity indoors, 1 p., 62 *d*.
Jennings, T[horp] B. Tornadoes in Kansas [Je. 24, 1909], 225 *b*.
Jones, M. E. Suggestions for the Weather Bureau to aid the agriculturist, 1 p., 802.
Juhlin, Julius. (Vapor pressure measurements noticed and quoted), 4, 6, 9.

Kenealy, James. Severe local storm at Cleveland, O. (Ap. 21, 1909), 2 p., 152.
Kimball, H. H. Nichol's "Theories of the color of the sky." (Abstract), 1 p., 15.
Kirk, J[oseph] M. Sleet storm in Ohio, F. 14, 1909, 112 *a*.
Klossovskiĭ, A[lexander Vikentievich]. Retirement of (A. Ziwet), 29 *d*.

Koeppen, W. Express all barometric measurements by the ordinary general units of force, 1 p., 92 *d*.

Landolt, Hans, and Richard Börnstein. (Adopted values for aqueous vapor pressure noticed and quoted), 5, 7, 9.
Library of United States Weather Bureau. Notes from (C. F. Talman), 9, 46.
Livingston, Grace J. Annotated bibliography of evaporation (continued), 21 p., 68, 103, 157, 193, 248.
Local storms. *Alabama. Piedmont,* Ap. 30, 1909, 208 *c*.
*Michigan.* My. 15, 1909, 209 *a*.
*Ohio.* High winds in, Ap. 7, 21, 29, 1909, 150 *d*.
*Ohio. Cleveland.* Ap. 21, 1909, 2 p., 152.
*South Carolina.* Severe winds, Mr. 25, 1909, *111 *c*.
Loisel, J. Squalls and thunderstorms, 3 p., 237.
McAdie, Alexander G. (Comment by, on Koeppen's suggested reforms in meteorological methods), 132 *b*.
Editor, District 10, The Great Basin. *See* Climatological summaries.
Editor, District 11, California. *See* Climatological summaries.
Frost damage prevented by covers, 1 p., 224 *c*.
Problem of the Sacramento, 956.
Rainfall of Hetch Hetchy Valley, [Cal.], 6 p., 1117.

Magnetic storms. Cause of, and the origin of terrestrial magnetism (K. Birkeland), 2 p., 16.
Marston, A. Effect of drainage work in northern Iowa on the flood stages of the rivers, 1 p., 1046.
Maring, D[elos] T. Exhibit of meteorological data, 1 p., 239 *d*.
Weather Bureau kiosks, 2 p., 89 *d*.
Marvin, C[harles] F[rederick]. Evaporation. Proposed new formula for, 4 p., 57.
Methods and apparatus for the observation and study of, 15 p., 141, 182.
Vapor pressure measurements, noticed and quoted, 4, 9.
Pressure of saturated vapor from water and ice as measured by different authorities, 7 p., 1 ch., 3.
Massachusetts. Harvard College observatory, meteorological work at (W. H. Pickering q. on), 1 p., 133 *d*.
Means, Thomas H. Agricultural engineer and the Weather Bureau, 1 p., 1107.
Meteors. Fireball of S. 20, 1909 [at Westwood, Mass.], (F. W. Very), 225 *a*.
Observations of. [How to report, 13, *b*, *c*.
Photographing the Leonids of N., 1909, [Prize offered for], (F. S. Archenhold), 199.
Trains of. How to observe (C. C. Trowbridge), 13 *b*, *c*.
Importance of systematic observations of persistent meteor trains (C. C. Trowbridge), 2 p., 11.
Meteorological methods. Reform in, suggested (A. G. McAdie), 132 *b*.
Comments on his suggestion (C. Abbe), 132 *b*.
Reforms in, suggested (M. E. J. Gheury), 1 p., 91.
(H. H. Clayton), 92 *a*.
(W. Koeppen), 1 p., 92 *d*.
Meteorological terms. Weather words in all languages (C. Abbe), 62 *b*.
Used in the Philippines (J. P. Finley), 62 *c*.
Meteorology. History of, in the United States, chronological outline (C. Abbe), 7 p., 87, 146, 178, [Addenda] 252 *d*.
Missouri. *Mexico.* Seasons and the mean daily minimum [temperature] at (G. Reeder), 3 p., 241 *d*.
Mixer, Charles A. The 24-hour day, 175 *b*.
Monthly Weather Review. Changes in the Monthly Weather Review (W. L. Moore), 61, 100 and Ch. IX., Mr., 207.
Contributions to, on relations of forests, precipitation, and run-off (W. L. Moore), 833 *a*.
New (W. L. Moore), 1 p., 266.
Problems that ought to be discussed in the new Monthly Weather Review (F. H. Bigelow), 979 *b*.
Moon. Moon blameless [for spring frosts] (C. Flammarion), 1 p., 130 *d*.
Moore, Willis L[uther]. Invitation to discuss in the Monthly Weather Review, the relations of forests to precipitation and run-off of water, 833 *a*.
Monthly Weather Review, changes in, 2 p., 61, 100.
New Monthly Weather Review, 1 p., 266.
Munn, Hans, jr. Hydrography of the South Palouse River, Wash., 3 p., 966.

National Forests. *Nanti.* Distribution of forest types in (L. Crowell), 803.
Navigation. *Great Lakes.* Ice conditions on, winter of 1908–09 (N. B. Conger), 2 p., *244 *d*.
Navigator Islands. *See* Samoa.
Neifert, W. W. Snow, is this one natural method of making? [Q. from New England Palladium of F. 6, 1810], 64 *a*.
New York. Snowfalls and water equivalents in [for 1905–1909], (R. E. Horton), 151.
Nichols, E[dward] L. Color of the sky, theories of (Abstract, H. H. Kimball), 1 p., 15.
Overcast skies, study of, 4 p., 18.

Nile. Flood of, and the meteorology of Abyssinia, *46 *c*.
Niss, R. Aurora of May 15–16, 1909, report on, 156 *c*.
Northers. Northers of the Sacramento Valley (T. A. Blair), 1 p., 132 *c*.

Oberholzer, George R. Report on tornado at Erie, Pa., on O. 21, 1909, 734 *c*.
Observatories. Teneriffe, meteorological observatory at, 95 *d*, 191 *b*.
*Belgium*. Royal observatory, H. Vincent appointed director of, *10 *b*.
O'Gara, P[atrick] J. Psychrometer, portable rotation, 1 p., 21.
Oklahoma. *Cherokee*. Hot winds at, Jl. 11, 1909, 337.
Optical phenomena. [Atmospheric transparency], (W. H. Pickering q. on), 1 p., 133 *d*.
Color of the sky, theories of (E. L. Nichols; abstract by H. H. Kimball), 1 p., 15.
(Luminous cloud observed in connection with severe wind storm, Columbia, S. C.), *111 *c*.
Overcast skies, study of [the spectrum of the light of], (E. L. Nichols), 4 p., 18.
Rainbow, an inverted (Rocca di Papa Observatory, Ap. 9, 1909), 47 *b*.
Sky light, percentage of polarization of (H. H. Kimball), †16 *b*.
Sunset glow at New Orleans, La., S. 19, 1909, 623.

Palmer, Andrew H. [Aurora of May 15–16, 1909, observations of, Q.], 156 *d*.
Palmer, W[alter] S. Some climatic features of Wyoming and their relation to dry farming, 2 p., map, 54.
Periodicity. Weather cycles in the growth of big trees [in Arizona], (A. E. Douglass), 10 p., *225 *d*.
Phenology. In Missouri (1904–1907), [soft maple and autumn foliage], (G. Reeder), map, 244.
Philippines. Meteorological terms used in (J. P. Finley), 62 *c*.
Physics. Terrestrial and cosmical physics, a plea for (L. A. Bauer), 2 p., 27.
Pickering, W[illiam] H[enry]. Q. on transparency of the atmosphere throughout the world, 1 p., 133 *d*.
Pilot charts. Meteorological, of the Atlantic and Pacific oceans, 110.
Polis, [Peter]. Lectures by, on meteorology for balloonists, *10 *b*.
Precipitation. Excessive. *Louisiana*. *St. Francisville*. S. 21, 1909, 635.
*West Indies*. *Jamaica*. N., 1909, 988.
"Grades" of rain (O. Tetens), 3 p., 203.
Rain with low temperature (A. L. Rotch), 21 *d*.
*Arizona*. Tree growth and precipitation in (A. E. Douglass), 10 p., *225 *d*.
*California*. Excessive local annual falls during 1909, †1116.
*Hetch Hetchy Valley*. Rainfall of (A. G. McAdie), 6 p., maps, 1117.
*Tuolumne River*. Precipitation over the basin of (M. Manson), 1120.
*West Indies*. *Dominican Republic*. *Puerto Plata*. Monthly rainfall, 1908–1909, 207 *b*; maximum 24-hour fall, 1908–1909, 207 *b*.
*New York*. Snowfall and water-equivalents in [for 1905–1909], 151.
*Mississippi*. Relation between precipitation, run-off, and discharges in the Tallahatchie drainage district (A. L. Dabney), 2 p., 917.
*Missouri*. *Mexico*. Precipitation totals, daily, 1878–1907 (G. Reeder), 3 p., 242.
*Samoa*. *Apia*. Annual, monthly, daily, hourly, 1902–6 (O. Tetens), 200.
*West Indies*. *Jamaica*. [Current record], 42, 123, 171, 219, 255, 398, 540, 687, 831, 988. [Annual summary], 1145.
*West Indies*. *Porto Rico*. Average annual rainfall of Porto Rico (O. L. Fassig), 4 p., maps, 982.
*Wyoming*. [In relation to dry farming], (W. S. Palmer), 2 p., map, 54.
Pressure. Barometric pressure and earth pulsation (N. Shimono), †65 *a*.
Psycho-physical law. *See* Weber's law.
Psychrometers. Portable rotation psychrometer (P. J. O'Gara), 1 p., 21.
Psychrometer: rotated, whirled, ventilated (C. Abbe), †23 *c*.
Publications.
Hydrological Journal, proposed, 979 *b*.
Meteorological charts of the oceans [published by U. S. Weather Bureau], 1 p., 110.
Recent additions to the Weather Bureau Library, 24, 67, 102, 149, 180, 247, 402, 541, 687, 832, 989, 1146.
Recent papers bearing on meteorology, 25, 66, 101, 149, 181, 246, 400, 542, 688, 832, 989, 1146.

Quinn, John T. Cyclones in the West Indies, relation of the movements of high clouds to, 6 p., 134 *d*.

Radiation. Solar. Researches on the solar constant and the temperature of the sun. (Abstract, J. Scheiner), 65 *b*.
Ramsay and Young. Vapor pressure measurements noticed and quoted, 5, 6, 9.
Reeder, George. Seasons and the daily minimum [temperature] at Mexico, Mo., 3 p., maps, 241 *d*.
Tornadoes in Missouri [Je. 22, 1909], 225 *c*.
Regnault, [Henri] V[ictor]. Vapor pressure measurements noticed and quoted, 3, 6.
Relative humidity. Winter aridity indoors (M. S. W. Jefferson), 1 p., 62 *d*.
Rivers. Hydrographs, special, for the Colorado and its tributaries, Je. and Jl., 1909, 364.
Rivers and Floods. *In* Forecasts and warnings, 2, 45, 86, 126, 174, 222, 399, 540, 687, 831 *c*, 988, 1145.
Rotch, A[bbott] L[awrence]. Highest balloon ascension in North America [ballon-sondes], 199.
Rain with low temperature, 21 *d*.
Royal Meteorological Society Officers for 1909, *10 *c*.

Sacramento River, Cal. Problem of the Sacramento (A. G. McAdie), 956.
Samoa. [*Apia*.] Meteorological registrations in, 1902–1906 (O. Tetens), 11 p., 93, 200, 240.
Rainfall (O. Tetens), 7 p., 200.
Sunshine (O. Tetens), 2 p., 240.
Winds [1906], (O. Tetens), 2 p., 93.
Sandstorms. *Texas*. Duststorms in (C. Abbe), 16 *b*.
Scheel, K. *See also* Thiesen, M. and K. Scheel.
Scheiner, J. Researches on the solar constant and the temperature of the sun. (Abstract), 65 *b*.
Schneider, C[harles] F. Destructive storms in Michigan [My. 15, 1909], 209 *a*.
Scientific meetings, attendance on [desirable for meteorologists], (W. J. Humphreys), 1 p., 56.
Scientific trespass, 131 *c*.
Scottish Meteorological Society, prize offered by, 47 *c*.
Seattle Exposition, 1909. [San Diego, Cal., climatological exhibit at the Alaska-Yukon-Pacific Exposition, 1909], (F. A. Carpenter), 176.
Sheley, Horace W. Practical benefits of the Weather Bureau, 1 p., 1108.
Shimono, N. Barometric pressure and earth pulsation. (Abstract), 65 *a*.
Simpson, H. E. Meteorology at Colby College, 1 p., 177.
Smith, D. T. Influence of mountains and coasts on storms, 64 *c*.
Smith, J. Warren. Editor, District 6, Missouri Valley. *See* Climatological Summaries.
High winds in Ohio, 150 *d*.
Snow. Is this one natural method of making snow? (New England Palladium), 64 *a*.
Red snow in Michigan [Ap. 10-11, 1909], (A. Wiesner), 156 *b*.
Specific gravity of snow (M. E. J. Gheury), 2 p., *98 *d*.
Transformations of snow crystals (A. Erman), 1 p., 13.
*Massachusetts*. *Springfield*. [Q. New England Palladium on heavy fog turning into snow, Ja. 12, 1810], 64 *a*.
Solar constant. Researches on the solar constant and the temperature of the sun. (Abstract, J. Scheiner), 65 *b*.
Solar relations. Weather cycles in the growth of big trees [in Arizona], (A. E. Douglass), 10 p., *225 *d*.
Solyom, Herbert L[ouis], Argentine weather, 3 p., 96.
South Palouse River, Wash. Hydrography of the South Palouse River, Wash. (H. Munn, jr.), 3 p., 966.
Squalls. Durand-Gréville cited on classification of, 238 *a*.
Prediction of, method for, proposed by Durand-Gréville, 239 *c*.
Squalls and thunderstorms (J. Loisel), 3 p., maps, 237.
Squall.
Squall "band" defined, 239 *c*.
"front" defined, 237 *d*.
"hook." *See* "nose."
"nose" defined, 239 *a*.
"nose" occurs, 665 *c*.
"trough" defined, 239 *a*.
"wind" defined, 238 *b*.
"zigzag" defined, 237 *a*.
"zone" defined, 237 *a*.
Storms. Christmas storms of 1909 (W. M. Wilson), 2 p., 999.
Influence of mountains and coasts on [paths of], (D. T. Smith), 64 *c*.
["*Portland* storm" of N. 27, 1898, compared with the "Christmas storm" of D. 26, 1909], (W. M. Wilson), 1000 *a*.
*Canada*. Tracks of lows for Ja., 1908; Ja., Ch. IX.
Stupart, R. F. Cold waves, source of our [U. S.], 26 *a*; ch. IX, X, Ja.
Q. as to recent extensions of the Canadian meteorological service, 15 *b*.
Suggestions for the Weather Bureau to aid the agriculturist (M. E. Jones), 1 p., 802.
Sunshine. Effect of insolation on the diurnal wind period, with diagram [Samoa, Apia], 95 *b*.
*Samoa*. *Apia*. Records of, 1902-1906 (O. Tetens), 2 p., 240.
Tables. Description of tables and charts (P. C. Day), 1 p., 34.
Talman, C. Fitzhugh. Notes from the Weather Bureau Library, 9, 46.
Recent additions to the Weather Bureau Library, 24, 67, 102, 149, 180, 247, 402, 541, 687, 832, 989, 1146.
Recent papers bearing on meteorology and seismology, 25, 66, 101, 149, 181, 246, 400, 542, 688, 832, 989, 1146.
Taylor, Joseph, and A. H. Thiessen. Smudge-pot test at Salt Lake City, Utah, S., 1909, 1 p., 658.
T[aylor], T[homas] R. Tornadoes in Arkansas (F., 1909), 154 *d*.
Teisserenc de Bort, Leon. [Q. on terrestrial cloud belts], *133 *d*.
Telegraphy. Wireless. [Hurricane off Yucatan reported by the *Cartago* by wireless and used in forecasts] (E. B. Garriott), 539 *a*.

Temperature. Great inversions of (A. J. Henry), 1 p., 22.
Rain with low temperature (A. L. Rotch), 21 *d*.
*Central America*. Map of mean annual temperatures for (P. P. Calvert), 66 *a*.
*Mexico*. Map of mean annual temperatures for (P. P. Calvert), 66 *a*.
*Missouri. Mexico*. Seasons and the mean daily minimum, at (G. Reeder), 3 p., 249 *d*.
*West Indies. Dominican Republic. Puerto Plata*. [Monthly extremes, Jy. 1908–Je. 1909], 207 *b*.
Teneriffe. Meteorological observatory established on (C. Abbe, jr.), 95 *d*, 191 *b*.
Tetens, Otto. Meteorological registrations in [Apia], Samoa, 1902–1906. I. Winds, 2 p., 93; II. Rainfall, 7 p., 200; III. Sunshine, 2 p., 240.
Thermodynamic scale, relation between the hydrogen thermometer and, D. Berthelot q. on (C. F. Marvin), †5 *d*.
Thermometer. Hydrogen, relation between the thermodynamic scale and, D. Berthelot q. on (C. F. Marvin), †5 *d*.
Thiesen, M., and K. Scheel. Vapor pressure measurements noticed and quoted, 5, 6, 9.
Thiessen, Alfred H. Editor, District 10, Great Basin. *See* Climatological Summaries.
Thiessen, Alfred H., and Joseph Taylor. Smudge pot test at Salt Lake City, Utah, S., 1909, 1 p., 658.
Thunderstorms. A balloon among (C. J. Glidden), 175 *b*.
Squalls and thunderstorms (J. Loisel), 3 p., 237.
*California. Southeast Farallon*. S. 26, 1909, *665 *c*.
Thunderstorm "nose," 111 *c*; 239 *a*. *See also* Squall "nose."
Time. [Adopt] the 24-hour day (C. A. Mixer), 175 *b*.
Tornadoes. Losses and casualties by, in Arkansas, Mr. 8, 1909, 155.
*Alabama*. F., 1909, 111 *b*; Ap. 30, 1909, 154 *c*; Ap., My., 1909, 208.
*Anniston*. Ap. 13, 1909, 1 p., *207.
*Arkansas*. F., Mr., Ap., 1909, 2 p., 154.
*Brinkley*. Mr. 8, 1909, 1 p., 155.
*Georgia. Cuthbert*. Mr. 9, 1909, 110 *d*.
*Savannah*. My. 1, 1909, 177.
*Illinois. Marion*. Ap. 6, 1909, 151 *d*.
*Indiana. Terre Haute*. D. 5, 1909, 1023 *d*.
*Kansas*. F., Ap., 1909, *151 *d*; My., 1909, 210 *b*; Je., 1909, 225 *c*.
*Mississippi*. F., 1909, 112 *a*; Ap. 6, 29, 1909, *153 *a*.
*Missouri*. Ap. 29, 1909, 207 *d*; Je. 22, 1909, 225 *c*.
*North Dakota*. My., 1909, 210 *b*.
*Oklahoma*. My. 29, 1909, 199 *d*.
*Pennsylvania. Erie*. O. 21, 1909, 734.
*Tennessee* Ap. 29, 1909, †152.
*Texas*. F., Mr., 1909, 111 *c*.
*Zephyr*. My. 30, 1909, 210 *b*.
Totten, R[alph] J. Weather notes from Puerto Plata, D. R., †207 *b*.
Trees. Annual rings of Arizona big pines, measurements of (A. E. Douglass), 7 p., 230.
Growth, average rate of, in Arizona (A. E. Douglass), 2 p., 235 *b*, *d*.
Tree growth in Arizona, weather cycles in (A. E. Douglass), 10 p., *225 *d*.
Trowbridge, C. C. Importance of systematic observation of persistent meteor trains, 2 p., 11.

United States. Climatological "Districts." *See also* Climate. United States.
District 4, Lake region. Physical features of (J. H. Armington), 1 p., 1036.
U. S. Weather Bureau. Agricultural engineer and (T. H. Means), 1 p., 1107.
Practical benefits of [to the general public], (H. W. Sheley), 1 p., 1108.

Venus. Clouds of, and their significance (A. W. Clayden), 4 p., Ch. IX., Ap., 127.
Very, Frank W. Fireball of September 20, 1909 [at Westwood, Mass.], 225 *a*.
Vincent, J[ean]. Appointed director of the meteorological service of the Royal Observatory, Belgium, *10 *b*.
Vortices. Assymmetric land cyclone (F. H. Bigelow), 6 p., 48.
Concave dumb-bell-shaped vortex (F. H. Bigelow), 53 *b*.
Studies on the vortices in the atmosphere of the earth.—VI. The assymmetric land cyclone and its system of vortex lines. The concave dumb-bell-shaped vortex (F. H. Bigelow), 6 p., 48.
Van Orstrand, C[harles] E. Simple application of the theory of probabilities to weather prediction. [Comments by H. C. Frankenfield], 1 p., 175 *d*.
von Herrman, C[harles] F. Cuthbert, Ga., tornado [Mr. 9, 1909], 110 *d*.
Editor, District 2, South Atlantic and East Gulf States. *See* Climatological Summaries.
Severe hailstorm at Atlanta, Ga., O. 14, 1909, 1 p., 710 *d*.
The West Indian hurricane of O. 11, 1909, 1 p., 710.

Walz, Ferdinand J. Editor, District 3, Ohio Valley. *See* Climatological Summaries.
Water. Undercooled, crystallization of (B. Weinberg), 1 p., 14.
Waterspouts. Waterspouts on the Atlantic coast, 112 *c*.
Weather. Weather of the month. [Monthly summary], 30, 73, 112, 161, 209, 253, 397, 538, 685, 829, 986, 1143.
Weather, forecasts, and warnings for the month. [Monthly summary], 397, 538, 685, 829, 986, 1143.
Weather reports. Daily, for the globe. International Commission on, meeting at Monaco, 10 *a*.
Weather service. *Germany. Frankfurt a/M*. Weather service for the exposition of 1909 at, 46 *d*.
Weber's Law. Q. with reference to Teten's rain "grades," 203 *c*, *d*.
Weinberg, Boris. Crystallization of undercooled water, 1 p., 14.
West Indies. *Dominican Republic. Puerto Plata*. Weather notes from (R. J. Totten), 207 *b*.
*Jamaica*. Precipitation. [Current record], 42, 123, 171, 219, 255, 398, 540, 687, 831, 988. [Annual summary], 1145.
*Porto Rico*. Precipitation (average monthly, seasonal, and annual), [1899–1909], (O. L. Fassig), 983 *b*, *d*, maps.
*St. Croix*. Cloud movements [in relation to hurricanes], 6 p., 134 *d*.
Winds. *See also* Chinooks, Northers.
Wiebe, H. F. Vapor pressure measurements noticed and quoted, 5, 6, 9.
Wiesner, A[be]. Red snow in Michigan, 156 *b*.
Wilson, Wilford M. Christmas storm of 1909, 2 p., 999.
Editor, District 1, North Atlantic States. *See* Climatological Summaries.
Winds. Squall "wind" defined, 238 *b*.
[Wind and earth pulsation], (N. Shimono), †65 *a*.
*Oklahoma. Cherokee*. Summer hot winds at (I. M. Cline, A. L. Ray), 1 p., 337.
Wireless telegraphy. *See* Telegraphy.

Young. *See also* Ramsay and Young.

Ziwet, Alexander. Klossovskiĭ, retirement of A[lexander Vikentievich], 29 *d*.
Zodiacal light. Spectrum of (E. A. Fath), 253 *a*, *c*.