

Glossary of Meteorological Terms

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Weather Bureau

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PART VIII. GLOSSARY

A. TECHNICAL TERMS

Absolute temperature.—The temperature of the centigrade thermometer, increased by 273°, more properly called the temperature on the absolute or thermodynamic scale. On the Fahrenheit scale the absolute zero is approximately 459° below the Fahrenheit zero.

Actinometer.—An instrument for measuring the intensity of radiation received from the sun.

Adiabatic.—The word applied in the science of thermodynamics to a process during which no heat is communicated to or withdrawn from the body or system concerned. Adiabatic changes of atmospheric temperature are those that occur only in consequence of compression or expansion accompanying an increase or a decrease of atmospheric pressure. Such changes are also described as dynamic heating and cooling.

Advection.—The process of transfer by horizontal motion, particularly applied to the transfer of heat by horizontal motion of the air. The transfer of heat from low to high latitudes is the most obvious example of advection.

Advection fog.—Fog resulting from the transfer of warm, humid air over a cold surface, especially a cold ocean surface, or (comparatively rarely) from the transport of air that is relatively very cold over an ocean surface that is relatively very warm.

Aerology.—The study of the free atmosphere throughout its vertical extent, as distinguished from investigations confined to the layer of the atmosphere adjacent to the earth's surface. Aerological investigations are made directly with pilot balloons, sounding balloons and by means of airplanes. They are also made indirectly by visual observations from the ground. Included in the latter are observations of clouds, meteor trails, the aurora, etc.

Afterglow.—The glow in the western sky after sunset.

Air mass.—A term applied by meteorologists to an extensive body of air within which the conditions of temperature and moisture in a horizontal plane are essentially uniform.

Air mass property.—Any quality or quantity the nature or value of which can be used in a characterization of the physical state or condition of an air mass.

Alto cumulus.—A form of cloud. (See part V.)

Alto stratus.—A form of cloud. (See part V.)

Anemogram.—The record traced by a self-registering anemometer.

Anemometer.—An instrument for measuring the force or speed of the wind.

Anemoscope.—An instrument for indicating the existence of wind and showing its direction.

Aneroid barometer. (See part II.)

Anomaly.—The difference between the mean of any meteorological element, or phase of that element, over a given time at a particular place, and the mean of the same element or phase over the same time for all other points on the same parallel of latitude.

Anthelion.—A rare species of halo, consisting of a brilliant, usually white, image of the sun opposite the latter in azimuth. (This term has also been applied to the glory, q. v.).

Anticrepuscular rays.—The continuation of the crepuscular rays, converging toward a point in the sky opposite to the sun.

Anticyclogenesis.—The term applied to the process which creates or develops a new anticyclone. The word is applied also to the process which produces an intensification of a pre-existing anticyclone.

Anticyclone.—An area of high barometric pressure and its attendant system of winds. (Cf. Cyclone.)

Antitrades.—The term applied to the westerly winds which are observed at high elevations above the trade winds.

Antitwilight arch.—The pink or purplish zone of illumination bordering the shadow of the earth (dark segment), in the part of the sky opposite the sun after sunset and before sunrise.

Aqueous vapor.—Water vapor. (Cf. Humidity.)

Arcs of Lowitz.—A pair of rare halo phenomena. These arcs are directed obliquely downward from the parhelia of 22° on either side of the sun toward the halo of 22°.

Arctic front.—The line of discontinuity between very cold air flowing directly from the Arctic regions and polar maritime air that has moved away from its source region in a more or less circuitous path and been warmed through contact with the ocean surface.

Atmosphere.—The whole mass of air surrounding the earth.

Aurora.—A luminous phenomenon due to electrical discharges in the atmosphere; probably confined to the tenuous air of high altitudes. It is most commonly seen in sub-Arctic and sub-Antarctic latitudes. Called *aurora borealis* or *aurora australis*, according to the hemisphere in which it occurs. Observations with the spectroscope seem to indicate that a faint "permanent aurora" is a normal feature of the sky in all parts of the world.

Back.—Of the wind, to shift in a counterclockwise direction; opposite of veer. In scientific practice this definition now applies to both hemispheres.

Bar.—A unit of pressure equal to 1,000,000 dynes per square centimeter. A bar=100 centibars=1,000 millibars. A barometric pressure of one bar is sometimes called a "C. G. S. atmosphere," and is equivalent to a pressure of 29.531 inches of mercury at 32° F. and in latitude 45°.

Barocyclonometer.—One of the several instruments that have been devised for locating tropical hurricanes without the aid of a weather map.

Barogram.—The continuous record made by a self-registering barometer.

Barograph.—A self-registering barometer.

Barometer.—An instrument for measuring the pressure of the atmosphere. The two principal types are the mercurial and the aneroid. The microbarometer is used to show very small changes of pressure.

Barometric tendency.—The change of barometric pressure within a specified time (usually three hours), before the observation.

Beaufort scale.—The scale of wind force devised by Admiral Sir Francis Beaufort in 1805.

Bishop's ring.—A large corona due to fine dust in the atmosphere. It has been seen after certain great volcanic eruptions, especially that of Krakatoa, in 1883.

Blizzard.—A violent, intensely cold wind, laden with snow.

Bright segment.—The broad band of golden light that, in clear weather, borders the western horizon just after sunset and the eastern just before sunrise.

Buys Ballot's law.—In the Northern Hemisphere, if you face the wind the atmospheric pressure decreases toward your right and increases toward your left. In the Southern Hemisphere the reverse is true. The law is useful in locating centers of cyclones and anticyclones.

Calibration.—The name ordinarily given to the process of ascertaining the corrections to be applied to the indicated readings of an instrument in order to obtain true values.

Calm.—Absence of appreciable wind.

Calms of Cancer; calms of Capicorn.—The belts of high pressure lying north of the northeast trade winds and south of the southeast trade winds, respectively.

Cascade.—The name applied to the mass of spray or dense vapor thrown outward from around the base of a waterspout. Also known as "bush", or "bonfire."

Center of action.—Any one of several large areas of high and low barometric pressure, changing little in location, and persisting through a season or through the whole year; e. g., the Iceland low, the Siberian winter high, etc. Changes in the intensity and positions of these pressure systems are associated with widespread weather changes.

Centibar.—(See Bar.)

Centigrade.—A thermometric scale on which 0° denotes the temperature of melting ice, and 100° the temperature of boiling water, both under standard atmospheric pressure.

Chinook, or chinook wind.—A foehn blowing down the eastern slopes of the Rocky Mountains over the adjacent plains, in the United States and Canada. In winter, this warm, dry wind causes snow to disappear with remarkable rapidity, and hence it has been nicknamed the "snow-eater" (Cf. Foehn).

Circumscribed halo.—A halo formed by the junction of the upper and lower tangent arcs of the halo of 22°, when the luminary is about 40° or more above the horizon. As the altitude of the luminary increases, the circumscribed halo gradually assumes an elliptical form and finally merges into the halo of 22°.

Circumzenithal arc.—A rainbow-tinted halo, often very bright, convex to the luminary, and 46° or a little more above it. It is sometimes called the upper quasi-tangent arc of the halo of 46°, but the circumzenithal arc and the halo of 46° are rarely seen at the same time.

Cirrocumulus.—A form of cloud. (See part V.)

Cirrostratus.—A form of cloud. (See part V.)

Cirrus.—A form of cloud. (See part V.)

Climate.—The prevalent or characteristic meteorological conditions of any place or region.

Climatology.—The study of climate.

Cloud banner.—A banner-like cloud streaming off from a mountain peak.

Cloud-burst.—A sudden and extremely heavy downpour of rain; especially in mountainous regions.

Cloud cap.—A cap-like cloud crowning (1) a mountain summit, or (2) another cloud, especially a mass of cumulonimbus.

Col.—A neck of relatively low pressure between two anticyclones; also called a saddle.

Cold air mass.—Broadly speaking, an air mass that is cold relative to neighboring air masses. The term implies that the air mass originated in higher latitudes than those in which it now finds itself and that it is, therefore, colder than the surface over which it is moving.

Cold front.—The discontinuity at the forward edge of an advancing cold air mass which is displacing warmer air in its path.

Cold wave.—A rapid and marked fall of temperature during the cold season of the year. The United States Weather Bureau applies this term to a fall of temperature in 24 hours equaling or exceeding a specified number of degrees and reaching a specified minimum temperature or lower; the specifications varying for different parts of the country and for different periods of the year.

Conservative property.—Any air mass property the nature or value of which is affected comparatively little by the various modifying influences to which a moving body of air is exposed.

Continental climate.—The type of climate characteristic of the interior of a continent. As compared with a marine climate, a continental climate has a large annual and daily range of temperature.

Convection.—The upward or downward movement, mechanically or thermally produced, of a limited portion of the atmosphere. Convection is essential to the formation of many clouds, especially of the cumulus type.

Convergence.—The condition that exists when the distribution of winds within a given area is such that there is a net horizontal inflow of air into the area. The removal of the resulting excess is accomplished by an upward movement of air; consequently areas of convergent winds are regions favorable to the occurrence of precipitation.

Corona.—(See part VI.)

Corposant.—(See St. Elmo's fire.)

Countertrades.—(See Antitrades.)

Counter sun.—(See Antheion.)

Crepuscular rays.—(See part VI; see also "Sun drawing water.")

Cumuliform.—A general term applied to all clouds having dome-shaped upper surfaces which exhibit protuberances, the bases of such clouds being generally horizontal. Cumuliform clouds are characteristically distinct and separated from one another by clear spaces.

Cumulonimbus.—A form of cloud. (See part V.)

Cumulus.—A form of cloud. (See part V.)

Cyclogenesis.—The term applied to the process which creates or develops a new cyclone. The word is applied also to the process which produces an intensification of a preexisting cyclone.

Cyclone.—An area of low barometric pressure with its attendant system of winds. The cyclones occurring within the Tropics (tropical cyclones) are smaller, on an average, than those of higher latitudes and in many cases are the most violent of all storms, except tornadoes. Those occurring in higher latitudes (extratropical cyclones) whether originating there or in the Tropics, usually bring about marked changes of weather and temperature during their passage; their winds may be high or otherwise. Tropical cyclones are also called hurricanes (when violent), typhoons, or baguios. Extratropical cyclones are commonly known as lows or barometric depressions.

Dark segment.—The shadow of the earth which, in clear weather, rises from the eastern horizon at sunset and sinks below the western horizon at sunrise.

Débauche.—Breaking up of the ice in the spring in rivers and seas.

Deepening.—The occurrence of decreasing pressure in the center of a moving pressure system.

Depressions.—A cyclonic area, or low.

Deviation of the wind.—The angle between the direction of the wind and the direction of the pressure gradient. (Cf. Inclination of the wind.)

Dew.—Atmospheric moisture condensed, in liquid form, upon objects cooler than the air, especially at night.

Dewpoint.—The temperature at which, under ordinary conditions, condensation begins in a cooling mass of air. It varies with the specific humidity. The dewpoint is a conservative air mass property.

Discontinuity.—The term applied in a special sense by meteorologists to a zone within which there is a comparatively rapid transition of the meteorological elements.

Disturbance.—A local departure from the normal or average wind conditions of any part of the world, or, in other words, a feature of what is sometimes called the "secondary" circulation of the atmosphere, as distinguished from the general circulation. In everyday usage *disturbance* has come to be synonymous with *cyclone* and *depression*.

Divergence.—The condition that exists when the distribution of winds within a given area is such that there is a net horizontal flow of air outward from the region. The resulting deficit is compensated by a downward movement of air from aloft; consequently areas of divergent winds are regions unfavorable to the occurrence of precipitation.

Doldrums.—The equatorial belt of calms or light variable winds, lying between the two trade-wind belts.

Drizzle.—Precipitation consisting of numerous tiny droplets. Drizzle originates from stratus clouds. (See also part V.)

Drought.—A protracted period of dry weather.

Dry adiabatic lapse rate.—A rate of decrease of temperature with height approximately equal to 1° C. per 100 meters (1.8° F. per 328 feet.) This is close to the rate at which an ascending body of unsaturated air will cool due to adiabatic expansion.

Dry bulb.—A name given to an ordinary thermometer used to determine the temperature of the air, in order to distinguish it from the wet bulb.

Dry fog.—A haze due to the presence of dust or smoke in the air.

Dust counter.—An instrument for determining approximately the number of dust particles or condensation nuclei per unit volume in a sample of air.

Dynamic meteorology.—The branch of meteorology that treats of the motions of the atmosphere and their relations to other meteorological phenomena.

Eddy.—A more or less fully developed vortex in the atmosphere, constituting a local irregularity in a wind. All winds near the earth's surface contain eddies, which at any given place produce "gusts" and "lulls." Air containing numerous eddies is said to be "turbulent."

Equivalent potential temperature.—The temperature that a given sample of air would have if it were brought adiabatically to the top of the atmosphere (i. e., to zero pressure) so that along its route all the water vapor present were condensed and precipitated, the latent heat of condensation being given to the sample, and then the remaining dry air compressed adiabatically to a pressure of 1,000 millibars. The equivalent potential temperature at any point is therefore determined by the values of absolute temperature, pressure, and humidity. It is one of the most conservative of air mass properties.

Evaporimeter.—An instrument for measuring the rate of evaporation of water into the atmosphere.

Exposure.—In meteorology the method of presentation of an instrument to that element which it is destined to measure or record, or the situation of the station with regard to the phenomenon or phenomena there to be observed.

Eye of the storm.—A calm region at the center of a tropical cyclone or a break in the clouds marking its location.

Fahrenheit.—A thermometric scale on which 32° denotes the temperature of melting ice, and 212° the temperature of boiling water, both under standard atmospheric pressure.

Fall-wind.—A wind blowing down a mountainside; or any wind having a strong downward component. Fall-winds include the foehn, mistral, bora, etc.

False cirrus.—Cirruslike clouds at the summit of a thunder cloud; more appropriately called "thunderstorm cirrus."

Fata Morgana.—A complex form of mirage, characterized by marked distortion of images.

Festoon cloud.—Mammatacumulus.

Filling.—The occurrence of increasing pressure in the center of a moving pressure system. *Filling* is the opposite of *deepening*.

Foehn.—A dry wind with strong downward component, warm for the season, characteristic of many mountainous regions. The air is cooled dynamically in ascending the mountains, but this leads to condensation, which checks the fall in temperature through the liberation of latent heat. The wind deposits its moisture as rain or snow. In descending the opposite slope it is strongly heated dynamically and arrives in the valleys beyond as a warm and very dry wind. Some writers apply this term to any wind that is dynamically heated by descent; e. g., the sinking air of an anticyclone.

Fog.—A cloud at the earth's surface. Fog consists of numerous droplets of water, which are so small that they cannot readily be distinguished by the naked eye. In ordinary speech the term "fog" generally implies an obscurity of the atmosphere sufficiently great to interfere with marine and aerial navigation. (See also part V.)

Fogbow.—A rainbow, colorless or nearly so, formed in a fog.

Fog drip.—Moisture that is deposited on terrestrial objects by fog and drips from them to the ground.

Fractocumulus.—A form of cloud. (See part V.)

Fractostratus.—A form of cloud. (See part V.)

Front.—A surface of discontinuity between two juxtaposed currents of air possessing different densities, or, more simply, the boundary between two different air masses.

Frontogenesis.—The term used to describe the process which creates a front i. e., produces a discontinuity in a continuous field of the meteorological elements; also applied to the process which increases the intensity of a pre-existing front. Frontogenesis is generally set up by the horizontal convergence of air currents possessing widely different properties.

Frontolysis.—The term used to describe the process which tends to destroy a pre-existing front. Frontolysis is generally brought about by horizontal mixing and divergence of the air within the frontal zone.

Frost.—Atmospheric moisture deposited upon terrestrial objects in the form of ice crystals. Also called hoarfrost.

Frost smoke.—A fog produced by apparent steaming of the sea in the presence of air having a temperature much below freezing. Also called "Arctic-sea smoke."

Gale.—Wind with an hourly velocity exceeding some specified value. In American practice a wind of or exceeding force 8 on the Beaufort scale is counted a gale.

Glaze.—Term applied by the United States Weather Bureau to a smooth coating of ice on terrestrial objects due to the freezing of rain; often popularly called sleet. In Great Britain such a deposit is called glazed frost. A deposit of glaze on an extensive scale constitutes an "ice storm."

Glory.—A series of concentric colored rings seen around the shadow of the observer, or of his head only, cast upon a cloud or fog bank. It is due to the diffraction of reflected light.

Gradient.—Change of value of a meteorological element per unit of distance. The gradients commonly discussed in meteorology are the horizontal gradient of pressure, the vertical gradient of temperature, and the vertical gradient of electrical potential. Meteorologists now prefer the term "lapse-rate" to "vertical gradient."

Gradient wind.—A wind of the velocity which is necessary to balance the pressure gradient. The direction of the gradient wind is along the isobars, and the velocity is so adjusted that there is equilibrium between the force pressing the air toward the region of low pressure, and the centrifugal action to which the moving air is subject in consequence of its motion.

Granular snow.—A form of precipitation consisting of small nontransparent grains of snow.

Green flash.—A bright green coloration of the upper edge of the sun's disk, sometimes seen when the rest of the disk is below the horizon at sunrise or sunset.

Gust.—A sudden brief increase in the force of the wind. Most winds near the earth's surface display alternate gusts and lulls.

Hail.—Balls or irregular lumps of ice, often of considerable size, having a complex structure; large hailstones generally have a snowlike center, surrounded by layers of ice, which may be alternately clear and cloudy. Hail falls almost exclusively in connection with thunderstorms. (Cf. Sleet.)

Halo.—A generic name for a large group of optical phenomena caused by ice crystals in the atmosphere. The commonest of these phenomena is the halo of 22° (i. e., of 22° radius), surrounding the sun or moon. The halo of 46° and the rare halo of 90°, or halos of Hevelius, also surround the luminary. Other forms of halo are the tangent arcs, parhelia (or paraselenae), parhelic (or paraselenic) circle, anthelion, etc.

Haze.—A lack of transparency in the atmosphere caused by the presence of dust or of salt particles left by evaporated ocean spray. At a certain distance, depending on the density of the haze, all details of landscape and of color disappear. (See also part V.)

High.—An area of high barometric pressure; an anticyclone.

Hoarfrost.—(See Frost.)

Hot wave.—A period of abnormally high temperatures. It has sometimes been defined, in the United States, as a period of three or more consecutive days during each of which the maximum temperature is 90° F. or over.

Humidity.—The degree to which the air is charged with water vapor. This may be expressed in several ways. *Absolute humidity* expresses the weight of water vapor per unit volume of air; *relative humidity* is the ratio of the actual vapor pressure to the vapor pressure corresponding to saturation at the prevailing temperature, or simply the percentage of saturation; *specific humidity* expresses the mass of water vapor contained in a unit mass of moist air. Specific humidity is the only truly conservative air mass property of the three.

Hurricane.—A tropical cyclone; especially one of the West Indian region. (A cyclone originating in this region and passing northward into the Temperate Zone is often called a "West India hurricane," even after it has assumed the character of an extra-tropical cyclone, and if sufficiently severe, justifies the display of "hurricane warnings" at ports of the United States. "Hurricane" is also the designation of the highest wind force on the Beaufort scale.

Hydrometeor.—A generic term for weather phenomena such as rain, cloud, fog, etc., which mostly depend upon modifications in the condition of the water vapor in the atmosphere.

Hygograph.—A self-recording hygrometer.

Hygrometer.—An instrument for measuring the humidity of the air.

Iceberg.—A large mass of ice that breaks from the tongue of a glacier running into the sea and floats away.

Iceblink.—A white, luminous appearance near the horizon caused by the reflection of light from ice.

Ice needles.—Thin crystals or shafts of ice, so light that they seem to be suspended in the air. (See also part V.)

Ice rain.—1. A rain that causes a deposit of glaze. 2. Falling pellets of clear ice (called sleet by the United States Weather Bureau.)

Ice storm.—(See Glaze.)

Inclination of the wind.—The angle which the wind direction makes with the direction of the isobar at the place of observation. Over the ocean the angle is usually between 20° and 30°. (Cf. Deviation of the wind.)

Insolation.—Solar radiation, as received by the earth or other planets; also, the rate of delivery of the same, per unit of horizontal surface.

Instability.—A state in which the vertical distribution of temperature is such that an air particle, if given either an upward or a downward impulse, will tend to move away with increasing speed from its original level. (In the case of unsaturated air the lapse rate for instability will be greater than the dry adiabatic lapse rate; in that of saturated air greater than the saturated adiabatic lapse rate.)

Instrument shelter.—The American name of the cage or screen in which thermometers and sometimes other instruments are exposed at meteorological stations. Called thermometer screen in Great Britain.

Intertropical front.—The boundary between the trade wind systems of the northern and southern hemispheres. It manifests itself as a fairly broad zone of transition commonly known as the *Doldrums*.

Inversion.—An abbreviation for "inversion of the vertical gradient of temperature." The temperature of the air is ordinarily observed to become lower with increasing height, but occasionally the reverse is the case, and when the temperature increases with height there is said to be an "inversion."

Irisation.—Irregular patches or fringes of iridescence sometimes seen in clouds (called iridescent clouds), not corresponding in location with the ordinary corona or the known forms of halo (such as parhelia). They are probably fragments of coronas of unusual size, produced by exceedingly fine cloud particles.

Isobar.—A line on a chart or diagram drawn through places or points having the same barometric pressure. (Isobars are customarily drawn on weather charts to show the horizontal distribution of atmospheric pressure reduced to sea level or the pressure at some specified altitude.)

Isogram.—A line drawn on a chart or diagram to show the distribution of some physical condition in space or time (or both), by connecting points corresponding to equal values of the phenomenon represented. Most of the isograms used in meteorology are drawn on geographical charts, and show the distribution of a meteorological element in space only. A special form of isogram, known as the *isopleth*, shows the variation of an element in relation to two coordinates; one of the coordinates representing the time of the year (month), and the other usually the time of the day (hour), but sometimes space (especially altitude). The following list includes the most important meteorological isograms: *Anisallobar*, isogram of rise of barometric pressure

in a given time; *isallobar*, isogram of the amount of change in barometric pressure within a specified period; *isanomal*, or *isanomalous line*, isogram of anomaly, i. e., of the departure of the local mean value of an element from the mean pertaining to the latitude; *isobar*, isogram of barometric pressure; *isotherm*, isogram of temperature; *katisallobar*, isogram of fall of barometric pressure in a given time.

Isotherm.—A line on a chart or diagram drawn through places or points having equal temperatures.

Isothermal layer.—(See Stratosphere.)

Land and sea breezes.—The breezes that, on certain coasts and under certain conditions, blow from the land by night and from the water by day.

Lapse rate.—The rate of decrease of temperature in the atmosphere with height.

Lenticular cloud.—A cloud having approximately the form of a double-convex lens. Clouds of this sort may be formed at the crests of standing waves in the atmosphere such as are often induced by mountain ranges; usually they represent a transitional stage in the development or disintegration of one of the more well-known cloud types.

Lightning.—A disruptive electrical discharge in the atmosphere, or, generally, the luminous phenomena attending such a discharge.

Light pillar.—A form of halo, consisting of a column of light, vertical or nearly so, extending from or through the sun or moon. Called a sun pillar, or a moon pillar, as the case may be.

Line squall.—A more or less continuous line of squalls and thunderstorms marking the position of an advancing cold front.

Looming.—An apparent elevation of distant objects by mirage.

Low.—An area of low barometric pressure, with its attendant system of winds. Also called a barometric depression or cyclone.

Mammatocumulus.—A form of cloud showing pendulous sack-like protuberances.

March.—The variation of any meteorological element in the course of a day, year, or other interval of time; e. g., the diurnal march of temperature; the annual march of barometric pressure.

Marine climate.—A type of climate characteristic of the ocean and oceanic islands. Its most prominent feature is equability of temperature.

Maximum.—The highest value of any element occurring during a given period.

Meniscus.—The curved upper surface of a liquid in a tube.

Meteorograph.—A self-registering apparatus which records simultaneously the values of two or more meteorological elements. Certain types of meteorograph are connected, electrically or otherwise, with some of the standard instruments at meteorological stations. These record conditions at the earth's surface only. Other types are carried aloft by airplanes and free balloons.

Meteorology.—The science of the atmosphere.

Microbarograph.—An instrument designed for recording small and rapid variations of atmospheric pressure.

Millibar.—(See Bar.)

Minimum.—The lowest value of any element occurring during a given period.

Mirage.—An apparent displacement or distortion of observed objects by abnormal atmospheric refraction. Sometimes the images of objects are inverted, magnified, multiplied, raised, or brought nearer to the eye than the object. Refraction layers in the atmosphere often assume the appearance of fog. (See Refraction Phenomena, pages 80 to 82.)

Mist.—A very thin fog, in which the horizontal visibility is greater than 1 kilometer, or approximately 1,100 yards. (This is the definition laid down by the International Meteorological Organization.) In North America the word is often used synonymously with drizzle or fine rain. (See also part V.)

Mock fog.—A simulation of true fog by atmospheric refraction.

Mock sun.—(See Parhelion.)

Monsoon.—A wind that reverses its direction with the season, blowing more or less steadily from the interior of a continent toward the sea in winter, and in the opposite direction in the summer.

Nephoscope.—An instrument for measuring the movement of clouds.

Neutral point.—The term applied in a special sense to any point at which the axis of a wedge of high pressure intersects the axis of a trough of low pressure. Also called "saddle point."

Nimbostratus.—A form of cloud. (See part V.)

Noctilucent clouds.—Luminous, cirrus-like clouds sometimes visible throughout the short nights of summer; supposed to be clouds of dust at great altitudes shining with reflected sunlight. Such clouds were observed during several summers after the eruption of Krakatoa (1883), and are still occasionally reported.

Normal.—The average value which in the course of years any meteorological element is found to have on a specified date or during a specified month or other portion of the year, or during the year as a whole. Also used as an adjective in such expressions as "normal temperature," etc. Thus, for any station at which records have been maintained for years, we may compute the normal temperature of January 1, the normal pressure of February, the normal rainfall of the year, etc. The normal serves as a standard with which values occurring in a particular year may be compared in order to determine the departure from normal.

Nucleus.—A particle upon which condensation of water vapor occurs in the free atmosphere in the form of a water drop or an ice crystal.

Oblique arcs of the anthelion.—A rare form of halo, consisting of intersecting arcs, usually white, passing through the anthelion or the place where the anthelion would occur if visible.

Occluded front.—The front that is formed when and where the cold front overtakes the warm front of a cyclone. This front marks the position of an upper trough of warm air, originally from the warm sector, which has been forced aloft by the action of the converging cold and warm fronts.

Occlusion.—The term used to denote the process whereby the air in the warm sector of a cyclone is forced from the surface to higher levels. The process is accompanied by an increase in the intensity of the cyclone.

Ozone.—An allotropic form of oxygen which occurs transiently in small quantities in the lower atmosphere and is supposed to be permanently present and relatively abundant at high atmospheric levels.

Paranthesis.—A halo phenomenon similar to a parhelion, but occurring at a distance of 90° or more in azimuth from the sun. The solar distance of the ordinary paranthelia is 120°. (Analogous phenomena produced by the moon as source of light are called parantiselenæ.)

Paraselenæ (plural paraselenæ).—(See Parhelion.)

Paraselenic circle.—(See Parhelic circle.)

Parhelic circle.—A halo consisting of a white circle passing through the sun and parallel to the horizon. A similar phenomenon in connection with the moon is called a paraselenic circle.

Parhelion (plural parhelia).—A mock sun, or sun dog; a form of halo consisting of a more or less distinctly colored image of the sun at the same

altitude as the latter above the horizon, and hence lying on the parhelic circle, if present. The ordinary parhelia are 22° from the sun in azimuth, or a little more, according to the altitude of the luminary. Parhelia have occasionally been seen about 46° from the sun. Analogous phenomena seen in connection with the moon are called paraselenæ, mock moons, or moon dogs.

Pilot balloon.—A small free balloon the drift of which, as observed from the ground, indicates the movements of the air aloft.

Polar continental air.—The term used to describe any air mass that originates over land or frozen ocean areas in the polar regions. Polar continental air is characterized by low temperatures, low specific humidity and a high degree of vertical stability.

Polar front.—The surface of discontinuity separating an air mass of polar origin from one of tropical origin.

Polar maritime air.—The term used to describe any air mass that originally came from the polar regions but has since been modified by reason of its passage over a relatively warm ocean surface. Polar maritime air is characterized by moderately low surface temperatures, moderately high surface specific humidity, and a considerable degree of vertical instability.

Potential temperature.—The temperature that a specimen of air or other gas would assume if brought adiabatically to a standard pressure, now usually selected as 1,000 millibars.

Precipitation.—The collective name for deposits of atmospheric moisture in liquid and solid form, including rain, snow, hail, dew, hoarfrost, etc.

Pressure.—An elliptical expression, current in meteorological literature, for atmospheric pressure, or barometric pressure.

Pressure gradient.—The decrease in barometric pressure per unit horizontal distance in the direction in which the pressure decreases most rapidly.

Prevailing westerlies.—The belts of winds lying on the poleward sides of the subtropical high-pressure belts.

Psychrometer.—An instrument for measuring atmospheric humidity, consisting usually of a dry-bulb thermometer and a wet-bulb thermometer. The former is an ordinary mercurial thermometer. The latter has its bulb covered with muslin or other fabric, which is either permanently wet or is wetted before use. In some psychrometers there is only one thermometer, readings being taken both before and after moistening the bulb. In the aspiration psychrometer the air is drawn past the bulb by a revolving fan.

Pumping.—Unsteadiness of the mercury in the barometer caused by fluctuations of the air pressure produced by a gusty wind, or due to the oscillation of a ship.

Purple light.—The purple or rosy glow observed over a large area of the western sky after sunset and the eastern sky before sunrise; it lies above the bright segment that borders the horizon.

Pyrheliometer.—An instrument that measures solar radiation by its heating effects.

Radiation fog.—Fog characteristically resulting from the radiational cooling of air near the surface of the ground on calm clear nights.

Rain.—Drops of water falling from the sky. (See also part V.)

Rainbow.—A luminous arc formed by the refraction and reflection of light in drops of water. (See part VI.)

Rainfall.—A term sometimes synonymous with rain, but most frequently used in reference to amounts of precipitation (including snow, hail, etc.).

Rain gage.—An instrument for measuring rainfall.

Reduction.—As applied to meteorological observations, generally means the substitution for the values directly observed of others which are computed therefrom, and which place the results upon a comparable basis.

Refraction.—Astronomical refraction, change in the apparent position of a heavenly body due to atmospheric refraction; terrestrial refraction, change in the apparent position of distant terrestrial objects due to the same cause.

Relative humidity.—(See Humidity.)

Representative observations.—Those which give the true or typical meteorological conditions prevailing in an air mass; hence they must be relatively uninfluenced by local conditions.

Réseau.—A collection of meteorological stations operating under a common direction or in the same territory. An international réseau is a group of stations in different countries cooperating for any purpose. The réseau mondial is a world-wide system of selected stations, the observations of which may be utilized in studies of the meteorology of the globe.

Ridge.—A relatively narrow extension of an anticyclone or high-pressure area as shown on a weather chart.

Rime.—1. Hoarfrost. 2. A rough or feathery coating of ice deposited on terrestrial objects by fog. (The second meaning is the one now used in technical literature).

Saddle.—(See Col.)

St. Elmo's fire.—A luminous brush discharge of electricity from elevated objects, such as the masts and yardarms of ships, lightning rods, steeples, etc., occurring in stormy weather. Also called corposant.

Saturated adiabatic lapse rate.—A rate of decrease of temperature with height equal to the rate at which an ascending body of saturated air will cool during adiabatic expansion. The value of the latter, unlike the case for unsaturated air, is not the same under all conditions. However, under no circumstances is it greater than the dry adiabatic rate. It varies inversely with the temperature.

Saturation.—The condition that exists in the atmosphere when the partial pressure exerted by the water vapor present is equal to the maximum vapor pressure possible at the prevailing temperature.

Scarf cloud.—A thin cirruslike cloud which often drapes the summits of tall cumulonimbus clouds.

Sea breezes.—(See Land and sea breezes.)

Secondary.—A small area of low pressure on the border of a large or "primary" one. The secondary may develop into a vigorous cyclone while the primary center disappears.

Semicircle.—The "dangerous semicircle" of a cyclonic storm at sea is the half of the storm area in which rotary and progressive motions of the storm reinforce each other, and the winds are also directed in such a way as to drive a vessel running before the wind across the storm track ahead of the advancing center. The other half is called the "navigable" semicircle.

Shower.—A fall of rain, of short duration but often of considerable intensity, and usually consisting of relatively large drops. Also a similar fall of snow, sleet, or hail. Showers characteristically fall from isolated clouds separated from one another by clear spaces. They occur typically in air masses that possess a high degree of instability. (See also part V.)

Sleet.—1. Frozen or partly frozen rain; frozen raindrops in the form of particles of clear ice. (The official definition of the United States Weather

Bureau.) 2. Snow and rain falling together. (The British use, and the one occurring in publications of the International Meteorological Organizations. In popular and engineering use in the United States the word is often applied to a coating of glaze on trees, wires, rails, etc.)

Snow.—Precipitation in the form of small ice crystals, falling either separately or in loosely coherent clusters (snowflakes). (See also part V.)

Soft hail.—White, opaque, round pellets of snow. (See also part V.)

Solar constant of radiation.—The intensity of solar radiation outside the earth's atmosphere at the earth's mean distance from the sun. Recent investigations indicate that this intensity may vary and that its mean value is 1.94 gram-calories per minute per square centimeter of area lying normal to the incident solar ray.

Sounding balloon.—A free, unmanned balloon carrying a set of self-registering meteorological instruments.

Source region.—An extensive area of the earth's surface characterized by essentially uniform surface conditions and which is so placed in respect to the general atmospheric circulation that air masses may remain over it long enough to acquire definite characteristic properties. Examples of source regions are the ice-covered polar regions and the broad expanses of uniformly warm tropical oceans.

Specter of the Brocken.—The shadow of an observer and of objects in his immediate vicinity cast upon a cloud or fog bank; sometimes attended by a series of colored rings, called the glory or Brocken-bow.

Squall.—1. A sudden storm of brief duration; closely akin to a thunderstorm but not necessarily attended by thunder and lightning. 2. A sudden brief blast of wind, of longer duration than a gust.

Stability.—A state in which the vertical distribution of temperature is such that an air particle will resist displacement from its level. In the case of unsaturated air the lapse rate for stability will be less than the dry adiabatic lapse rate; in that of saturated air less than the saturated adiabatic lapse rate.

Static.—(See Stray.)

Storm.—A marked disturbance in the normal state of the atmosphere. The term has various applications, according to the context. It is most often applied to a disturbance in which strong wind is the most prominent characteristic, and sometimes specifically to a wind of force 11 on the Beaufort scale. It is also used for other types of disturbance, including thunderstorms, rainstorms, snowstorms, hailstorms, dust storms, sand storms, magnetic storms, etc.

Stratiform.—A general term applied to all clouds which are arranged in unbroken horizontal layers or sheets.

Stratocumulus.—A form of cloud. (See part V.)

Stratosphere.—The upper region or external layer of the atmosphere, in which the temperature is practically constant in a vertical direction. The stratosphere is free from clouds (except occasional dust clouds) and from strong vertical air currents, in other words, active convection. The height of its base (see Tropopause) varies in regular fashion with latitude and with the seasons over the earth as a whole and fluctuates irregularly from day to day over any particular place.

Stratus.—A form of cloud. (See part V.)

Stray.—A natural electromagnetic wave in the ether. The term is used in reference to the effect of such wave in producing erratic signals in radiotelegraphic receivers. Strays are also known as atmospheric, and collectively, as static.

Subsidence.—The word used to denote a slow downward motion of the air over a large area. Subsidence accompanies divergence in the horizontal motion of the lower layers of the atmosphere.

Sun pillar.—(See Light pillar.)

Sunshine recorder.—An instrument for recording the duration of sunshine; certain types also record the intensity of sunshine.

Surge.—A general change in barometric pressure apparently superposed upon cyclonic and normal diurnal changes.

Synoptic chart.—A chart, such as the ordinary weather map, which shows the distribution of meteorological conditions over an area at a given moment.

Synoptic meteorology.—The branch of meteorology that deals with the analysis of meteorological observations made simultaneously at a number of points in the atmosphere (at the ground or aloft) over the whole or a part of the earth, and the application of the analysis to weather forecasting and other problems.

Tangent arc.—Any halo that occurs as an arc tangent to one of the heliocentric halos.

Thermogram.—The continuous record of temperature made by a thermograph.

Thermograph.—A self-registering thermometer.

Thermometer.—An instrument for measuring temperature; in meteorology, generally the temperature of the air. Maximum and minimum thermometers indicate, respectively, the highest and lowest temperatures occurring between the times of setting the instrument. A wet-bulb thermometer is used in measuring humidity. (See Psychrometer.)

Thermometer screen.—A construction designed to screen a thermometer from the direct rays of the sun and from other conditions that would interfere with the registration of the true air temperature; usually a wooden cage with louvered sides. In the United States commonly called the instrument shelter.

Thunder.—The sound produced by lightning discharge.

Thunderstorm.—A storm attended by thunder and lightning. Thunderstorms are local disturbances, often occurring as episodes of cyclones, and, in common with squalls, are marked by abrupt variations in pressure, temperature, and wind.

Tornado.—1. A violent vortex in the atmosphere, attended by a pendulous, more or less funnel-shaped cloud. 2. In West Africa, a violent thundersquall.

Trade winds.—Two belts of winds, one on either side of the equatorial doldrums in which the winds blow almost constantly from easterly quadrants.

Trajectory.—The path traced out by a small volume of air in its movement over the earth's surface.

Transition zone.—The relatively narrow region occupied by a front wherein the meteorological properties exhibit large variations over a short distance and possess values intermediate between those characteristic of the air masses on either side of the zone.

Tropical disturbance.—The name used by the Weather Bureau for a cyclonic wind system of the tropics that is not known to have sufficient force to justify the use of the words "storm" or "hurricane."

Tropical maritime air.—The term used to describe any air mass that originates over an ocean area in the tropics. Tropical maritime air is characterized by high surface temperatures and high specific humidity.

Tropopause.—The point in the atmosphere at which the fall of temperature with increasing height abruptly ceases. This point marks the base of the

stratosphere. Over most of the earth it is located, on the average, at elevations of between 10 and 15 kilometers (6 and 9 miles) above sea level. Its normal level over the polar regions is somewhat below 10 kilometers and over the equator somewhat above 15 kilometers.

Troposphere.—The lower region of the atmosphere from the ground to the tropopause, in which the average condition is typified by a more or less regular decrease of temperature with increasing altitude.

Trough.—An elongated area of low barometric pressure.

Turbulence.—Irregular motion of the atmosphere produced when air flows over a comparatively uneven surface, such as the surface of the earth, or when two currents of air flow past or over each other in different directions or at different speeds. The existence of turbulence in the atmosphere is made apparent by the character of the trail of smoke from a ship's funnel and by gusts and lulls in the wind.

Twilight.—Astronomical twilight is the interval between sunrise or sunset and the total darkness of night. Civil twilight is the period of time before sunrise and after sunset during which there is enough daylight for ordinary outdoor occupations.

Typhoon.—The name applied in the Far East to a tropical cyclone.

Ulloa's ring.—1. A glory. 2. A halo (also called Bouguer's halo), surrounding a point in the sky diametrically opposite the sun; sometimes described as a "white rainbow."

V-shaped depression.—A trough of low barometric pressure bounded, on the weather map, by V-shaped isobars.

Vane.—A device that shows which way the wind blows; also called weather vane or wind vane.

Vapor pressure.—The pressure exerted by a vapor when it is in a confined space. In meteorology vapor pressure refers exclusively to the pressure of water vapor. When several gases or vapors are mixed together in the same space each one exerts the same pressure as it would if the others were not present; the vapor pressure is that part of the total atmospheric pressure which is due to water vapor.

Variability.—Interdiurnal variability is the mean difference between successive daily means of a meteorological element.

Veer.—Of the wind, to shift in a clockwise direction; opposite of "back." In scientific practice this definition now applies to both hemispheres.

Vernier.—An auxiliary scale for estimating fractions of a scale division when the reading to the nearest whole division on the main scale is not sufficiently accurate.

Visibility.—The transparency and illumination of the atmosphere as affecting the distance at which objects can be seen. It is usually expressed on a numerical scale.

Warm air mass.—Broadly speaking, an air mass that is warm relative to neighboring air masses. The term implies that the air mass originated in latitudes lower than those in which it now finds itself and that it is, therefore, warmer than the surface over which it is moving.

Warm front.—The discontinuity at the forward edge of an advancing current of relatively warm air which is displacing a retreating colder air mass.

Warm sector.—The area bounded by the cold and warm fronts of a cyclone.

Waterspout.—A tornadolike vortex and cloud occurring over a body of water.

Wave disturbance.—A localized deformation of a front, which travels along the front as a wave-shaped formation, and which generally develops into a well-marked cyclone.

Wedge.—1. A wedge-shaped area of high barometric pressure as shown on a weather chart. Synonymous with "ridge." 2. Applied to an air mass whose advancing forward portion, from a three-dimensional standpoint, is shaped like a wedge.

Wet bulb.—(See Psychrometer.)

Williwaw.—A sudden blast of wind descending from a mountainous coast to the sea. (Especially applied to such blasts in the Straits of Magellan.)

Wind.—Moving air, especially a mass of air having a common direction of motion. The term is generally limited to air moving horizontally, or nearly so; vertical streams of air are usually called "currents."

Wind rose.—1. A diagram showing the relative frequency and sometimes also the average strength of the winds blowing from different directions in a specified region. 2. A diagram showing the average relation between winds from different directions and the occurrence of other meteorological phenomena.

Zodiacal light.—A cone of faint light in the sky which is seen stretching along the zodiac from the western horizon after the twilight of sunset has faded and from the eastern horizon before the twilight of sunrise has begun.

B. COLLOQUIAL TERMS

"Backstays of the sun".—A sailor's name for crepuscular rays extending downward from the sun.

Baguio.—The name current in the Philippines for a tropical cyclone.

Bora.—A cold wind of the northern Adriatic, blowing down from the high plateaus to the northward. Also, a similar wind on the northeastern coast of the Black Sea.

Brave west winds.—The boisterous westerly winds blowing over the ocean between latitudes 40° and 50° S. This region is known as the "Roaring Forties."

Bull's-eye.—1. A patch of clear sky at the center of a cyclonic storm; the "eye of the storm." 2. A small isolated cloud seen at the beginning of a bull's-eye squall, marking the top of the otherwise invisible vortex of the storm.

Bull's-eye squall.—A squall forming in fair weather, characteristic of the ocean off the coast of South Africa; so called on account of the peculiar appearance of the small isolated cloud that marks the top of the invisible vortex of the storm.

Callina.—A Spanish name for dry fog.

Cat's paw.—A slight and local breeze, which shows itself by rippling the surface of the sea.

Chubasco.—A violent squall on the west coast of tropical and subtropical North America.

Cordonazo; in full, *cordonazo de San Francisco* ("lash of St. Francis").—A hurricane wind blowing from a southerly quadrant on the west coast of Mexico as the result of the passing of a tropical cyclone off the coast.

Devil.—The name applied to a dust whirlwind in India. The term is also current in South Africa.

"Doctor".—A colloquial name for the sea breeze in tropical climates. The name is sometimes applied to other cool, invigorating breezes.

Etesians.—Northerly winds blowing in summer over the eastern Mediterranean.

Garúa.—A wet fog of the west coast of South America.

Gregale.—The northeast wind on the Mediterranean; especially a stormy northeast wind at Malta.

Harmattan.—A dry, dusty wind of the West Coast of Africa, blowing from the deserts.

Horse latitudes.—The regions of calms and variable winds coinciding with the subtropical high-pressure belts lying on the poleward sides of the trade winds. (The term has generally been applied only to the northern of these two regions in the North Atlantic Ocean, or to the portion of it near Bermuda.)

Indian summer.—The period of mild, calm, hazy weather occurring in autumn or early winter, especially in the United States and Canada; popularly regarded as a definite event in the calendar, but weather of this type is really of irregular and intermittent occurrence.

Khamsin.—A hot, dry, southerly wind occurring in Egypt during the spring.

Leste.—A hot dry, easterly wind of the Madeira and Canary Islands.

Levanter.—A strong easterly wind of the Mediterranean, especially in the Straits of Gibraltar, where it is attended by damp or foggy weather.

Mackerel sky.—An area of sky covered with cirrocumulus or altocumulus clouds; especially when the clouds resemble the patterns seen on the backs of mackerel.

Mares' tails.—Cirrus in long slender streaks.

Mistral.—Along the Mediterranean coast, from the mouth of the Ebro to the Gulf of Genoa, a stormy, cold northerly wind, blowing down from the mountains of the interior. (The name is sometimes applied to northerly winds on the Adriatic, in Greece, and in Algeria.)

Moon dog.—A paraselene. (See Parhelion.)

Mountain and valley breezes.—The breezes that in mountainous regions normally blow up the slopes by day (valley breeze), and down the slopes by night.

Norther.—A northerly wind; especially strong northerly winds of sudden onset occurring during the colder half of the year over the region from Texas southward, including the Gulf of Mexico and the western Caribbean.

Pampero.—A southwest squall blowing over or from the pampas of South America. Off the coast of Argentina these squalls are most prevalent from July to September.

Papagayo.—A strong to violent northeasterly wind, somewhat similar to the Tehuantepecer, which blows during the colder months in the Gulf of Papagayo, on the northwest coast of Costa Rica, and in adjacent Pacific coastal waters.

Roaring forties.—(See Brave west winds.)

Scud.—Shreds or small detached masses of cloud moving rapidly below a solid deck of higher clouds. Scud may be composed of either fractocumulus or fractostratus clouds.

Shamal.—A northwesterly wind of Mesopotamia and the Persian Gulf.

Simoom.—An intensely hot and dry wind of Asian and African deserts; often described as a sand storm or dust storm, but certain authorities state that the typical simoom is free from sand or dust.

Sirocco.—A name applied to various types of warm wind in the Mediterranean regions. Some of these siroccos are foehns. The term is also used as the generic name for winds blowing from a warm region toward an area of low pressure in a normally colder region.

Sundog.—A mock sun or parhelion.

"Sun drawing water".—The sun is popularly said to be "drawing water" when crepuscular rays extend down from it toward the horizon. The sun's rays, passing through interstices in the clouds, are made visible through illumination of particles of dust in the atmosphere along their paths. (See part VI.)

Tablecloth.—A sheet of cloud that sometimes spreads over the flat top of Table Mountain, near Cape Town.

Tehuantepecer.—A strong to violent northerly wind of Pacific waters off southern Mexico and northern Central America, confined mostly to the Gulf of Tehuantepec, and occurring during the colder months.

Willy-willy.—A violent storm of wind and rain on the northwest coast of Australia. (The name is also applied in some parts of Australia to a local dust whirl.)

Woolpack.—Cumulus.