Vol. VIII No. 1

Bulletin
of
St. Louis University

The Geophysical Observatory

APRIL, 1912

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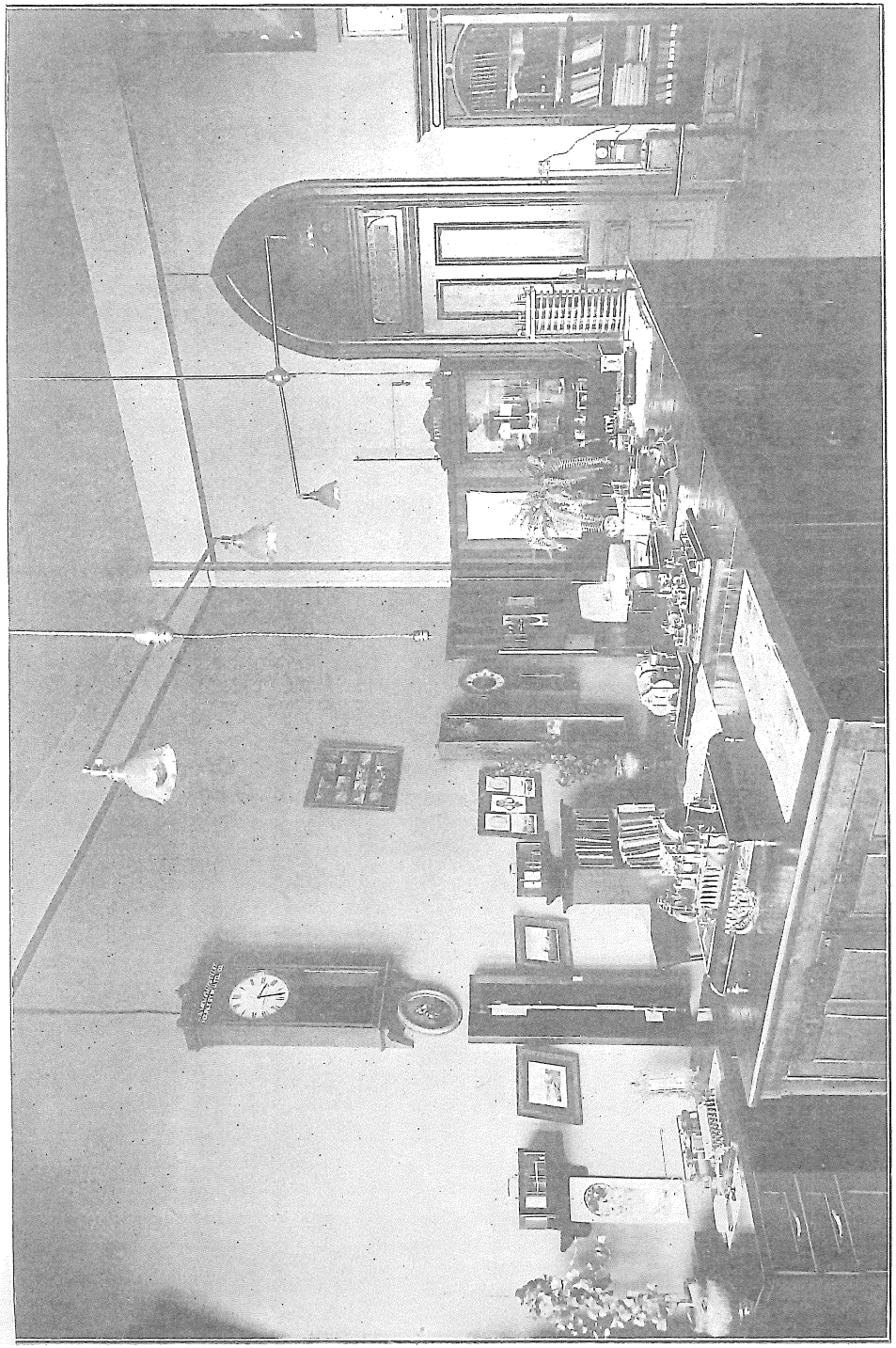


OBSERVATORY.

Meteorology in St. Louis University.

HISTORICAL OUTLINE. 1860-1910.

THE day on which the present observatory was opened, January 1, 1910, was the fiftieth anniversary of the first meteorological observatory begun at St. Louis University. Although the pioneer work had been interrupted long before the expiration of the half century, still it was an encouraging reality to those who, in happier times and with brighter prospects, fell heir to the invaluable records compiled with such scrupulous care by those early observers. Gratitude and respect for their efforts demand that we give more than a passing reference to the work accomplished by our predecessors.

Fifty years ago, at the request of the U. S. Government, meteorological observations were begun at the University. The station was located at what was then called "College Hill, a suburb of the city in St. Louis County." Latitude 38° 40′ north, Longitude 90° 15′ west. Mr. Francis H. Stuntebeck, S. J., then completing his studies in Theology at College Hill, was placed in charge and was assisted by Mr. John H. Luneman, S. J., of the Philosophy department. The ability and earnestness of these two pioneer observers is attested by the complete and careful records they have left us.

The first observations were taken on January 1, 1860, and consisted of readings of atmospheric pressure; maximum, minimum and mean temperatures; relative humidity; vapor pressure; precipitation; amount, kind, direction and velocity of clouds; direction and velocity of winds. Later, some of the instruments which had done service at St. Joseph's College, Bardstown, Ky., from 1857 till the closing of that institution in 1861, were transferred to the observatory on College Hill, St. Louis, Mo. During the year 1860 the efficiency of the observatory was lessened to such an extent by the encroachment of rendering establishments with their "two and seventy stenches, several and well-defined," and by foundries and rolling mills, that its location had to be changed. The instruments were removed to what was known as the Old College Building at Ninth and Washington Avenue, and Father Peter G. Koning, S. J., was appointed director. Father Koning determined the Latitude of the new station

to be 38° 37′ 28″ north, Longitude 90° 15′ west, and the height above sea level as 470 feet.

On May 23, 1861, Rev. Father Ignatius Panken, S. J., long and lovingly remembered by the people of St. Louis, succeeded to the directorship.

On September 24, 1861, Mr. Luneman, the former assistant, was placed in charge, holding the office until July, 1864, when Father Stuntebeck returned to the observatory. The latter was succeeded in January, 1869, by Mr. Aloysius Averbeck, S. J., and he in turn by Mr. Michael Tracy, S. J., in 1873.

It was in 1873 that the U. S. Government opened its own station in the city within a few blocks of the University. The observatory was thus relieved of its official responsibility and deprived of much of its usefulness, and, as a result, we find no data after March 26, 1874.

For 14 years, during which this department of St. Louis University existed, we find besides the accurate daily tabulation of the data enumerated above, many interesting notes among the "casual phenomena." Under August 7, 1860, we read: "An earthquake at 9 hrs. 17 min. A. M. felt by persons at College Hill. Lasted about 15 sec. The number of oscillations was about 30. Direction seemed to be from east to west. No noise was heard. Oscillations very distinct."

Under July 23 is the note: "A brilliant meteor appeared in the sky about south of this place. It exploded nearly over the large building. Part of it fell on the building. It was seen by one of the Brothers and by many persons that were passing by. Next morning I went to examine the roof of the building (metallic), but found nothing except a wet spot, which became dry during the day."

An interesting succession of events is thus tabulated: "January 1, 1864, the coldest day for at least 31 years. The Minimum Thermometer of 'Green' fell as low as 20° below zero, F. Doctor Engelmann's (Green Thermometer, too) went as low as 22° below zero during the night."

January 2: "Mississippi frozen over. January 5, Government wagons crossing the Mississippi on the ice. January 27, River open below and opposite the city; ferry boats crossed yesterday, broke the ice. Above the city, persons are still crossing on the ice."

Under January 15, 1865, we read: "This morning at 6 o'clock four rings were seen around the moon; the nearest white, the second blue, the third yellow, and the fourth light green. These lasted for some 6 or 8 minutes and then gradually disappeared."

On January 16, 1866: "The river was gorged with ice yesterday. To-day it broke above the city. The floating ice destroyed some seven or eight boats at the city landing."

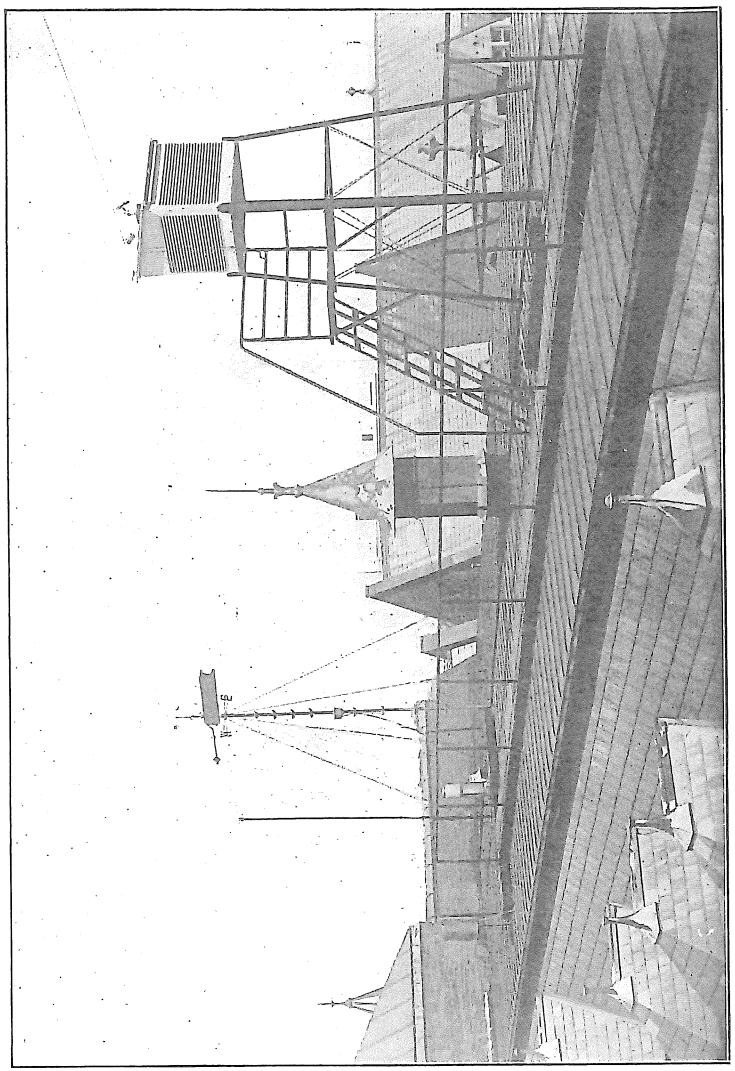
These are only a few of the many interesting notes, telling of the visits of earthquakes, storms, tornadoes, the aurora borealis, the migration of birds, etc.

THE NEW OBSERVATORY.

Some 36 years had to elapse before a favorable opportunity for re-establishing the observatory was met with. Meanwhile, the development of the University in its various departments had kept pace with the rapid growth of the city. The need of larger quarters and the encroachment of the business district had determined the authorities to abandon the old site at Ninth Street and Washington Avenue for a more suitable location. The outcome was the erection of the present group of modern buildings on Grand Avenue, Lindell and West Pine Boulevards.

That a Meteorological Observatory would be a valuable and perhaps necessary department in the general expansion of the University was readily conceded, but it was recognized likewise that, in view of the modern requirements of meteorology, none but the most complete and reliable equipment would form a useful investment. It was further desired that, if the observatory were re-established, it should be rather as a research laboratory than a station for gathering the ordinary weather data. The funds for carrying out this project were provided by friends of the University towards the close of the year 1909. A Meteorological Bureau of the first class was the established, and thereby long cherished hopes were realized. As soon as the instruments could be secured, the work of installing them began The roof of the Divinity Building, 76 feet above ground, was selected as the most advantageous location for the thermometers, wind vane, rain gauge, anemometer, etc. The exposure towards the residential district of the West End is particularly favorable. The proximity of the Administration and Arts and Science Buildings towards the east was found to exert no disturbing influence. The thermometer shelter is 86 feet, and the anemometer and wind vane 96 feet above ground. A cable carries the connections of the electrically recording instruments to the office room in the Arts and Science Building.

In the desire to begin official observations on January 1, 1910. those in charge of the observatory had to be content with a rather



INSTRUMENTS ON DIVINITY BUILDING.

inconvenient location for the recording instruments. It was only in September, 1910, that more suitable quarters were occupied, when one of the large physical laboratory rooms became vacant and was given over to the observatory.

Equipment.

The present equipment of the observatory consists of the following instruments:

1.) Fortin Barometer.
2.) Barograph, Richard Bros. pattern.
3.) Thermograph, Richard Bros. pattern.
4.) Maximum and Minimum Thermometers.
5.) Whirling Psychrometer.
6.) Hygrograph.
7.) Thermograph (National Clock and Electric Mfg. Co.).
8.) Tipping Bucket Rain Gauge.
9.) Snow Gauge.
10.) Electrical Sunshine Recorder.
11.) Jordan's Photographic Sunshine Recorder.
12.) Wind Vane.
13.) Anemometer (Robinson).
14.) Meteorograph (Quadruple Register).
15.) Ceraunograph (Lightning Recorder).
16.) Ceraunophone.
17.) Thermostatic and Temperature Alarm.
18.) Ground Thermometers.
19.) Several Standard Thermometers.
20.) Electrograph.

The instruments are of standard make and of United States Weather Bureau patterns.

SCOPE OF THE WORK.

The propriety of establishing a Meteorological Observatory as a department of a University may not be so obvious as to require no word of justification. As stated above, the purpose of the observatory is to conduct a research station. If our universities seek to promote the material welfare of the world by subsidizing and operating laboratories for research in agriculture, electricity, biology, medicine and a score of other sciences, why not, on the same plea, assume a

like attitude toward the study of the weather? True, other sciences enable us to get in more direct contact with the forces of nature and to make them the servants of our necessities and pleasures, while the meteorologist, after all his probing into the laws governing the phenomena of our atmosphere, may be able to do little more than foresee weather conditions at a comfortable distance, without being able to offer further protection. Thus stated, the advantages offered may not seem worth the effort; but they assume tremendous proportions when measured in terms of property saved, health and lives preserved. If such be the nature and extent of the advantage to be gained, there should be no hesitation in giving meteorology its proper relation to the other sciences now fostered in our universities.

This position gains strength from the fact that meteorologists themselves, at least in this country, look to the universities for assistance in solving their larger problems. At the Peoria Convention of Weather Bureau Officials, Professor Cleveland Abbe said: "We have also to wish that the professors and special mathematical students interested in meteorology shall have their attention directed specifically to some of our problems; for instance, the mathematical expressions for the action of the wind on a plane surface. . . . But there are still grander problems for the mathematicians of the universities. I refer to the motions of the atmosphere and the attendant temperature and rainfall."

Some experts, such as Professor Langley, have been lending their assistance in this way. The truest response to Professor Abbe's suggestion, however, assumes the shape of liberal endowments, for the purpose of putting the work on a safe and independent footing. A gift of this sort has furnished this observatory with its preliminary equipment, and it is only with the help of similar gifts that the research work, for which it was principally established, can be carried on.

In recent years the teaching of meteorology has been taken up, in one way or another, by a very large number of High Schools, Colleges and Universities, and in some places even by the Primary Schools. The extent to which it is adopted and the methods employed differ so widely, however, that it may be well to state here what attitude St. Louis University has assumed.

The proper time to introduce the youth of this country to the elements of meteorology is evidently the High School period. In the three High Schools of St. Louis University elementary meteorology is an elective, with Tarr as a text book. In the College of Arts and

Sciences and in the School of Philosophy and Science, meteorology is taught only indirectly, the respective professors of the various courses in physics being permitted to use their own judgment as to the extent to which the application to this science of the principles of mechanics, heat, molecular physics, electricity and magnetism should be enlarged upon. This conservative attitude is dictated chiefly by a familiar circumstance, local as well as general. The average student interested in science is bent on investing the capital of his talents in projects that give promise of big dividends. From this point of view, meteorology as a profession offers no strong temptation. For the Weather Bureau service—by which alone at present, in the absence of endowed positions at our universities, any inducements are offered—admittedly does not bear comparison in point of remuneration with other occupations open to the prospective engineer or physicist.

The alternative, suggested by Professor Abbe on the occasion mentioned above as a means of making the most of this very actual condition, viz., to induce our students to take up some special meteorological problems as a side issue, is put into practice at St. Louis University in the following manner:

This observatory has a definite number of assistant positions which are open to capable applicants. Whilst incumbents are expected to do the routine work, and to be at the general disposal of the officials in charge, they are supplied with all books and equipment necessary to obtain a thorough knowledge of the principles of the science, are permitted to do observational work, and are given individual direction in their efforts. They are kept in close touch with recent developments, especially with the research work at the observatory. No fee is demanded. At present eleven students, mostly interns, are availing themselves of these opportunities to a greater or less extent. This same method is followed in the Department of Seismology, and it may be mentioned here that the majority of the assistants lend their help in both departments.

Whatever greater good may come of this method, this much is assured, that a large number of capable minds will have become sufficiently interested and experienced in the science to contribute, to the extent of their opportunities, some of the "bricks and mortar" of which the much desired result will eventually be built up.

This observatory heartily seconds the efforts made by the U. S. Weather Bureau officials to familiarize the general public with the main working principles of meteorology, and thereby to eradicate

old superstitions and prejudices, and above all to hedge in the influence of illegitimate forecasters. With the exception of a daily bulletin issued for the perusal of intern students and members of the faculty, the observatory issues no forecasts.

THE CERAUNOGRAPH.

While the work of the past year has, of necessity, been chiefly constructional, we are pleased to be able to record some results achieved in at least one field of investigation. We have devoted considerable attention to the study of thunderstorms by way of perfecting the ceraunograph. The instrument is fairly well known in meteorological circles, but some account of the simplified form which we have given it may be of interest; and, as these lines are intended likewise for the uninitiated, we have thought it well to give a complete description of the instrument, as well as a brief elementary explanation of the principles involved.

That a means of predicting the approach of thunderstorms, hours in advance of their arrival, cannot fail to be of immense utility needs no comment. Everyone is aware that of the appalling loss of life and property occasioned by meteorological factors, by far the greater part falls to the account of the thundersquall and the tornado. These phenomena usually appear without much warning, and before we have time to seek shelter or to protect our goods we are overtaken by powerful and shifting gusts of wind, violent discharges of lightning, and frequently by a heavy downpour of rain and hail. It is the being caught unawares for which we must pay so dearly. Yet, until a very short time ago, we had no way of learning when to be on our guard. There was no practical or expeditious method of obtaining warning reports of these storms.

It was, therefore, a thoroughly welcome advance when it was discovered that thunderstorms give ample warning of their coming by means of powerful signals sent out broadcast, and a still greater step forward when an instrument was devised for intercepting these signals.

In a paper communicated to the Royal Society in 1867, and with greater completeness in his treatise on Electricity and Magnetism in 1873, Clerk Maxwell set forth his epoch-making theory of electromagnetism, suggesting therein that electro-magnetic effects travel through space in the form of transverse waves similar to those of light and having the same velocity. In 1888, conclusive experimental

proof of this theory was found by Heinrich Hertz, of the University of Bonn, Germany, who succeeded in producing these electro-magnetic waves by means of an "oscillator." This instrument consisted of two metallic conductors between which an electric spark was permitted to pass. Hertz observed that the current "oscillated" or rocked back and forth between the conductors until equilibrium was obtained, very much as water when suddenly poured into a U tube will surge from one side to the other until it comes to rest. When the rapidity of these "oscillations" is made very high, some of the energy of the discharge is cast off into space and travels on in the shape of "electro-magnetic waves." A close analogy to this resulting action is the formation of ripples on the surface of a pond when a stone is thrown into it, except that the "electric ripples" spread out in all directions. These electro-magnetic or Hertzian waves, as they are now called, constitute the warning signals of the thunderstorm.

Naturally, Hertz's achievement attracted wide attention, and immediately a number of great minds, among whom Lodge and Branly were conspicuous, set themselves to the task of devising a practical means of detecting the passage of these waves. One of the products of their investigations was the "coherer." Into a tube partly filled with metal filings two conducting plugs are introduced and connected with the poles of a battery. Owing to a thin coating of dust or of rust on their surfaces these filings ordinarily offer a very high resistance to the passage of a current through them, but when an electric wave strikes the tube, they suddenly "cohere" and become conductive. A slight tap throws them back into their former state of high resistance, thus making them ready to record the next wave.

The "coherer" received its widest application in wireless telegraphy. As it was found, however, that Hertzian waves are produced by thunderstorms, meteorologists recognized that the new instrument might prove a highly valuable addition to their station equipment. In 1895 Popoff, of the Russian navy, obtained a record of a distant thunderstorm by means of a filing coherer placed in a circuit with a relay. With this start the development of the lightning recorder was taken up by Tommasina, Boggio-Lera, Lancetta, and by Fathers P. J. Schreiber, S. J., and J. Fényi, S. J., of the Kalocsa Observatory. In this country the pioneer work was done by Rev. F. L. Odenbach, S. J., Director of the Observatory at St. Ignatius College, Cleveland, O., who likewise gave his instrument the now accepted name "Ceraunograph."

The various types of ceraunograph now in use are much the same in general outline; they differ, however, in the form of "coherer" employed. Father Odenbach uses a coherer of his own invention. In place of the metal plugs of the filings coherer he substitutes two steel pins, placed parallel to each other and about an inch apart, and across these pins he lays several small sticks of graphite. The particles of graphite exhibit the same phenomena of resistance to the electric current and of coherence under the influence of Hertzian waves as the metal filings in the tube coherer. The pins are clamped to a strip of hard rubber by means of binding posts, and this strip in turn is attached to the base of a telegraph sounder which thus also serves as decoherer. Small paper discs are glued to the ends of the graphite rods to separate them from each other and prevent their being thrown off the pins by the decoherer. In the construction of the coherer, and with certain modifications in the arrangement of the other parts of the instrument, we have followed the very successful plan elaborated by Father Odenbach.

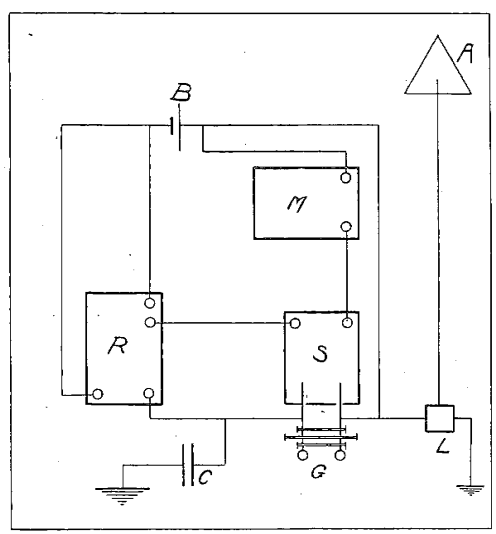


FIG. 1

Our aerial consists of 900 feet of No. 10 bare copper wire stretched horizontally between the towers of the Divinity and Arts and Science Buildings and the high smokestack in the rear of the Philosophy Building. It forms an equilateral triangle, and at a

point about 100 feet out over the Campus, a single strand leads away from the third angle to the Divinity tower. Leads are taken from the end at the Divinity tower and from the angle at the north tower of the Arts and Science Building. To guard against damage from high discharges through the wire, such as are occasionally caused by near-by lightning strokes, these leads are broken by a lightning arrester provided with a 2 or 4 ampere fuse. (Fig. 1) Beyond the arrester the aerial connection is introduced into the primary circuit of the instrument proper. This circuit passes through the graphite coherer, represented at *G*, and the relay *R*, and is operated by a single storage cell of 60 ampere hours capacity.

Between the coherer and the relay the aerial is grounded after passing through a fixed condenser *C*. The secondary circuit passes through the decoherer *S* and the recording magnet *M*, and is closed at the relay tongue. It has the same source of power as the primary circuit. The recording apparatus *M* is a single magnet register made by Friez, of Baltimore.

The successive steps in the operation of recording lightning discharges are briefly these: A wave or train of waves originating in the thunderstorm impinges on the aerial wire and descends on it into the primary circuit. At the coherer it finds the current ready to flow, but held in check by the resistance of the graphite. The wave transforms the graphite momentarily into a conductor, the current rushes through and operates the relay. The closing of the relay armature puts the secondary circuit into action; the sounder clicks, the magnet of the recorder closes and the pen makes a dash on the paper of the revolving drum. The very next moment the instrument is in readiness to record a second discharge, since the click of the sounder decoheres the graphite sticks and throws them back into their former state. The time required for the entire operation is, of course, only a small fraction of a second.

The above is a description of the ceraunograph in its essential form. In practice at this observatory four relays of different resistances are used, the desired one being thrown into the primary circuit by means of a four-point switch. Two of these relays, one of 1000 ohms, the other of 500 ohms, were made in our laboratory; the 250-ohm and 100-ohm instruments are of the ordinary type used in telegraphy. When the 1000-ohm relay is in operation we receive records of storms at Fort Worth, Tex.; Vicksburg, Miss.; Augusta, Ga.; Pittsburg, Pa.; Toledo, O.; Detroit, Mich., and Milwaukee, Wis., indicating a range of 500 miles or more. Throwing into the primary

circuit one relay after the other and noting their relative activity enables us to determine at what distance from St. Louis the storm area is centered at any time of the day. Thus, if observations show that the maximum activity is gradually shifting from the 1000-ohm instrument to those of less resistance we know that the area is moving towards us and vice versa.

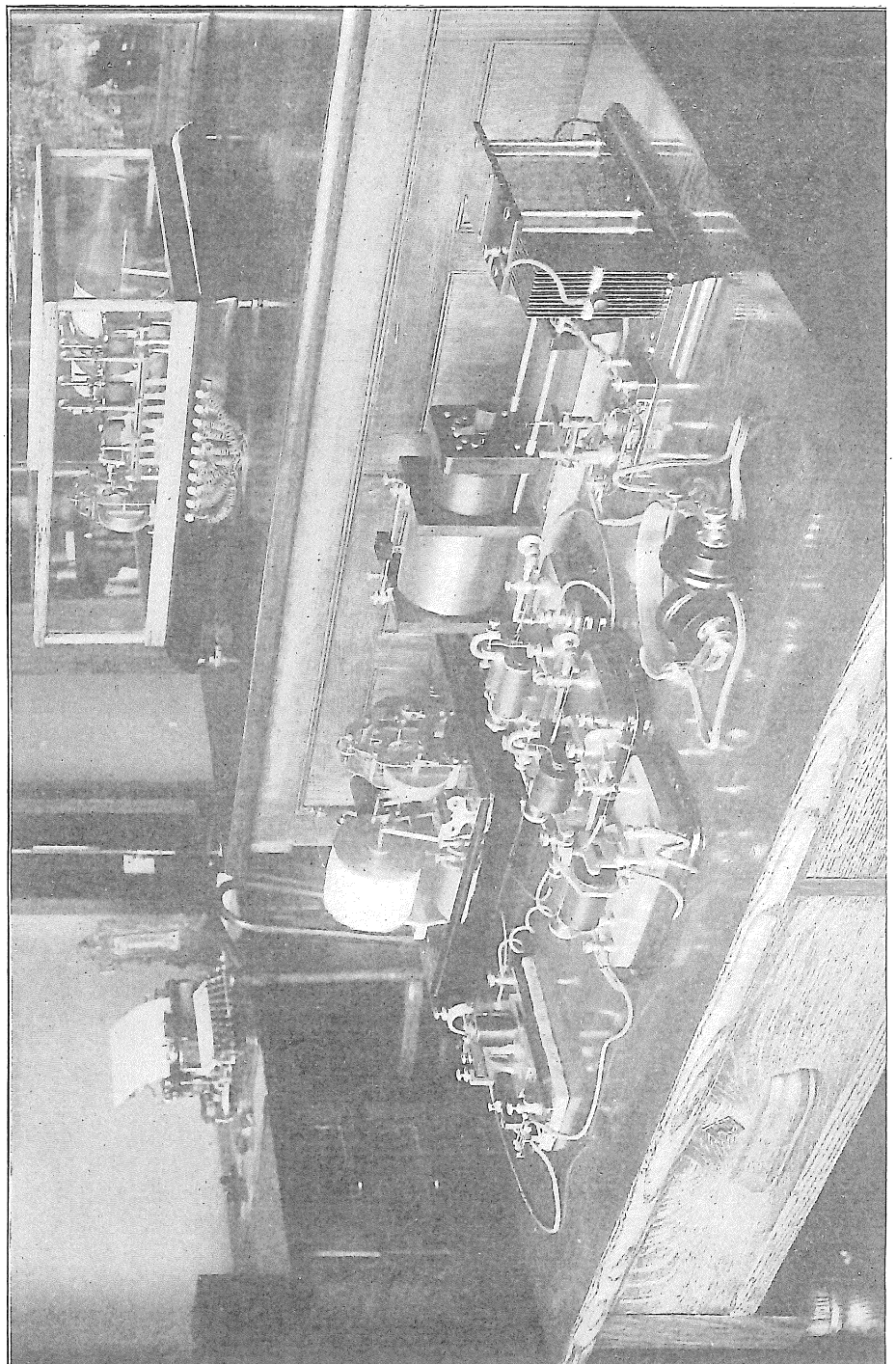
The sensitiveness of the coherer is regulated likewise by varying the number of sticks of graphite. Four are ordinarily used, but when the storm is overhead, the number is reduced to two. This ease of adjustment is one of the distinct advantages which the graphite coherer has over other types. What recommends it most, however, is its ready response to the decoherer.

The Branly radio-conductor, which forms the coherer of the ceraunograph at the Observatory of the Ebro, Spain, has a strong tendency to remain closed after a powerful discharge, resulting in the polarization of the battery and thus putting the instrument out of commission. The filings coherer also is inclined to become magnetized and must be laid aside. The graphite, on the other hand, becomes more effective with use. It must, however, be of a high grade. We have found A. W. Faber's "Siberian Leads for Artists' Pencils" (HHH No. 5900) highly satisfactory.

After the erection of the present aerial, in May, all of the 47 thunderstorms that passed over St. Louis up to January, 1911, were recorded by the ceraunograph. The instrument gave warning of their approach from 6 to 16 hours in advance. The severe storm at 7 P. M. on July 26 was picked up at the observatory 12 hours previously. Some disturbances, of course, especially heat thunderstorms, give much briefer warnings than those accompanying a "low," but the relative sensitiveness of the coherer, by betraying the electrical condition of the atmosphere, indicates just what probability exists for their occurrence.

A particularly happy change has been the placing of the condenser in its present position, for it has eliminated almost all possibility of non-decoherence, a very serious difficulty in the past. The danger has been further removed by using the same battery to actuate both circuits. This arrangement is also an important step towards the simplification of the instrument.

A cherished project, and one which promises to increase the efficiency of the instrument immensely, is the erection of a large umbrella aerial in place of the present horizontal one. By a peculiar manipulation of its various strands, about which it is too early to say



CERAUNOGRAPH AND CERAUNOPHONE.

anything now, we hope to be able to learn, in addition to the distance, the direction of the storms from the observatory. When this has been done the last step will have been taken in the development of the ceraunograph on the principle now followed. For some time we have considered the installation of a revolving antenna such as is employed by the Jesuit Fathers at the Observatory of the Ebro, but have decided in favor of the umbrella aerial because of its greater ease of manipulation.

While we have no intention of using the ceraunograph in forecast work, that being outside of our scope, we are very anxious to see it reach a state of development where it can be installed and used with confidence and ease by all meteorological stations in the service of the public. We are confident, too, that this happy event is much desired by all who are aware of the destructiveness of unforeseen thunderstorms.

THE CERAUNOPHONE.

Wireless operators are familiar—sometimes disagreeably so—with the influence of thunderstorms on their instruments. Lightning discharges anywhere within range of the aerial are sure to make themselves heard in the receivers, and, as the waves they send out may be of varying lengths and are always very powerful, it is rather difficult to tune them out. But the ill wind has blown us good; for this very inconvenience suggested that a wireless receiving outfit would prove a splendid auxiliary to the ceraunograph.

In September of this year a first-class set of instruments made by Murdock, of Chelsea, Mass., was installed. Our expectations were fully realized when the single low-power receiver was discarded for a double head phone of 4000 ohms resistance. We were then enabled to explore the electric condition of the atmosphere far beyond the range of the ceraunograph. The receivers, under certain conditions, give better indications than the coherer of the intensity of a distant disturbance. We can always be sure about the adjustment of the ceraunophone, and thus have a reliable check on the more complicated working of the ceraunograph. The ceraunophone, of course, without written records can hardly supersede the ceraunograph in meteorological observations, for here the written record is essential, both for safe comparison from hour to hour and for future reference. As an auxiliary equipment, however, it possesses immense value.

A diagram of the arrangement of the instrument is given in Fig. 2. The loose coupled tuner *I* is in parallel with the variable condenser *C*, while the detector *D* is in series with the receivers. After

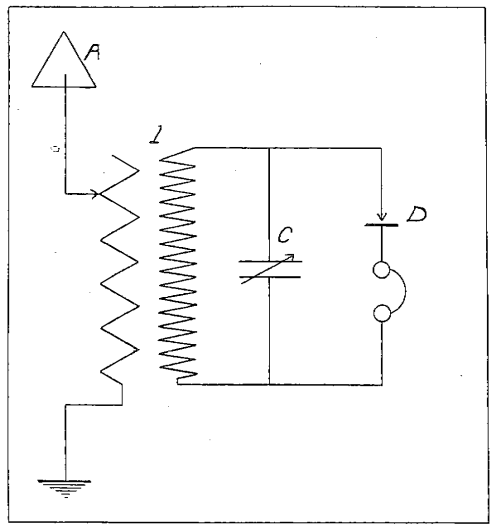


FIG. 2

considerable experimentation a silicon detector of the latest type was adopted as being most satisfactory for our purpose. The receivers have each a resistance of 2000 ohms.

JORDAN SUNSHINE RECORDER.

Another instrument added to the equipment of the observatory in the course of the present year is a Jordan Sunshine Recorder. A few remarks on the theory of this instrument will not be out of place in the present report, since the splendid treatise on the subject, published by the well known meteorologist, Rev. Julius Fényi, S. J., in 1891, may not be readily accessible to some of our readers. However, as the Reverend Author has given us his kind permission, we shall make liberal use of his work in our treatment of the subject.

The instrument consists of a hollow metal cylinder of radius 3.1 cm. and length 9.1 cm., so placed on an adjustable stand that its axis is parallel to the axis of the earth, and its two holes each 60° on either side of the meridian plane (*i. e.*, of the plane which passes

through the zenith, the celestial poles, the axis of the cylinder and the axis of the earth).

We are to find a simple equation, which will permit us to determine the time corresponding to a given point in the curve traced on the sensitive film by the pencil of solar rays penetrating into the cylinder through one of the holes. This we might do by determining the locus of the recording point with respect to space co-ordinates. It would evidently be an ellipse formed by the intersection of a variable plane with the cylinder. A simpler plan, however, and one equally accurate, will be the following: Figure 4 is a copy of a record

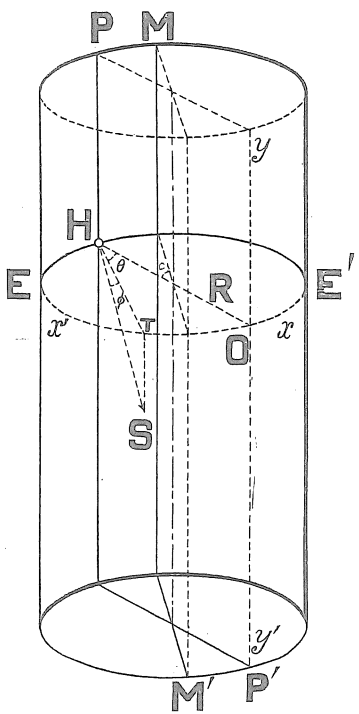


Fig. 3.

obtained on the photographic film which is placed on the interior surface of the cylinder. H and H' are two holes in the film which coincide with the two holes in the cylinder. By properly choosing the position of plane Cartesian co-ordinates, we can obtain an equation in terms of known quantities which will satisfy the given locus

when the record is flattened out for examination as in Fig. 4. Through the cylinder we pass three planes, one EE' perpendicular to the cylinder and cutting the center of the hole H; another PP'

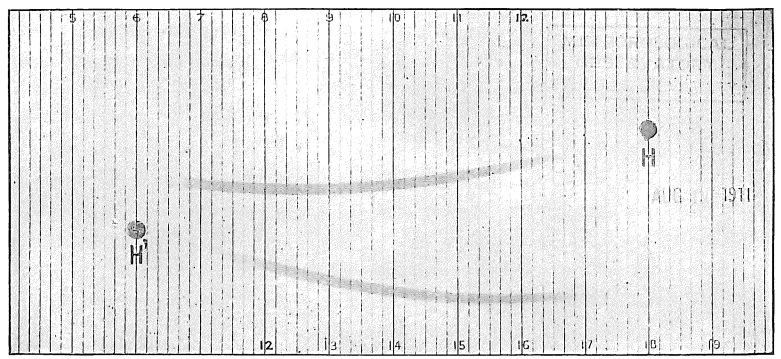


Fig. 4.

through the axis and the hole H; the third MM' through the axis and coinciding with the plane of the local meridian. (See Figure 3.)

For the origin of co-ordinates we shall select the point O diametrically opposite to the hole H. The line of intersection of the plane EE' with the cylinder we shall make the axis of abscissæ xx'; and the line of intersection of the plane PP' with the cylinder will be the axis of ordinates yy'.

Now a ray of sunlight entering the cylinder at H will follow some path HS and impinge on the film on the opposite interior surface. The projection of this path on the plane EE' will be $HT = HO \cos \theta$, (since HTO is a right angle, being inscribed in a semicircle) $= 2R \cos \theta$, where R is the radius of the cylinder and θ the angle between HO and HT. Furthermore, the path HS makes a certain angle ϕ with its projection HT. The tangent of this angle is given by ST/HT. Hence $ST = HT \tan \phi$. Now ST is the ordinate of the point S, hence we may write $y = HT \tan \phi$ (2). But HT we have shown to be equal to $2R \cos \theta$ from (1), the angle ϕ is the angle of declination, D, of the sun, since EE' is parallel to the equatorial plane. Substituting these values in (2), we obtain: $y = 2R \cos \theta \tan D$ (3). Again, θ, being inscribed in a semicircle, is measured by half the subtending arc OT. But in radians $OT = OT/R = x/R$, since we agreed to call the line of intersection of EE' with the cylinder the axis of abscissæ. Hence angle $\theta = x/R \div 2 = x/2R$. Substituting in (3) we have our equation $y = 2R \cos x/2R \tan D$ (4).

The same reasoning and the same equation will hold for the other hole H' in the cylinder, and it remains only to find at what time of day $x = 0$, or when the sun will be in the plane PP'. Since the sun, no matter what its declination, passes over approximately equal meridian angles or the same number of degrees of longitude in equal intervals of time (15° per hour), $d\theta/dt = k$. And since θ is always an inscribed angle, it follows that $dx/dt = k'$. Therefore, given that the angle o between the planes PP' and MM' is 60°, $60 \div 15 = 4$ will give the number of hours before or after apparent noon when the sun will be in the plane PP' and $x = 0$; that is, at 8 A. M. or 4 P. M. It follows from this consideration that if we divide off the record by a system of parallel straight lines, equally spaced, the perpendicular distance across them will be proportional to the time and, if the space between the lines is so chosen as to correspond to one hour, the time of day can be read directly from the record. The value of this hour space may be obtained as follows from the relations shown above: Since $\theta_h = x_h/2R$, $x_h = 2R\theta_h$. Or, as θ_h (the angle passed over by the sun in one hour) $= \pi \div 12$, $x_h = \pi R \div 6$. Hence the beginning and the end of the Sunshine record or the passing of a cloud can be accurately timed. However, it must be noted that the actinic effect of the sun's rays for about one-half hour after sunrise and the same length of time before sunset is too weak to record photographically in this way.

GROUND TEMPERATURE.

On March 1, 1910, observations of ground temperature at a depth of 5 ft. below the surface were begun at this observatory. We were led to undertake these observations by a consideration of the interesting and valuable results obtained through them by a number of observers in various parts of the world.

The measurement of ground temperature is a very simple matter. In the small garden adjoining the Philosophy and Science Building two sections of 3 in. hard drainage tile were sunk into the ground. A few inches below the surface, the upper section, which has a movable cap, projects into a six-inch crock, the bottom of which has been removed. This crock is provided with a close-fitting lid, and is entirely covered by a small wooden tub. This triple covering effectively protects the shaft from the disturbing influence of solar radiation and atmospheric temperature. thus insuring true values for the temperature at the bottom of the shaft. The thermometer is suspended from the cap of the tile by means of a chain. The thermometer bulb was wrapped in asbestos paper to provide insulation from the atmospheric temperature while the reading is taken. In practice, however, the shaft never remains open more than about five seconds, the time required to make a single observation.

To explain the chief purpose of this branch of our work is a task which we reserve for a future publication.

Location of Observatory.

Latitude: 38° 38′ 17″ north.
Longitude: 90° 13′ 58″.5 west.
Elevation: 578 ft. above sea level.
Wind Vane: 94 ft. above ground.
Anemometer: 96 ft. above ground.
Top of Rain Gauge: 80 ft. above ground.
Floor of Thermometer Shelter: 10 ft. above roof and 86 ft. above ground.

Explanation to Meteorological Summaries.

Atmospheric Pressure in inches reduced to mean sea level.
Mean Temperature: the mean of three daily observations.
Mean Vapor Pressure and Mean Relative Humidity: the mean of the three daily readings of the various thermometers reduced according to the method used by the U. S. Weather Bureau.
Signs used for Miscellaneous Phenomena: The International Meteorological Symbols.
The official day ends with 7:00 P. M., except for wind velocity and direction, which end at 12:00 midnight.

THE WEATHER OF 1910.

January, 1910.

Temperature and precipitation were about normal. A heavy fall of rain and sleet on the 4th, followed by freezing temperature—the lowest of the month—on the 5th and 6th, blocked traffic and caused much suffering among the poor. The snowfall was light, one inch falling on the 30th. There were no sudden or extreme changes in temperature.

February, 1910.

The month of greatest snowfall in the history of local weather conditions. A low pressure from the Southwest on the 9th brought 5 inches, the blizzard on the 16th, 13.8 in.—the heaviest fall in 25

years—and smaller amounts scattered through the month, brought the total up to 20.6 in. The mean temperature, 29°, was 5° below the normal. On the 18th the lowest temperature of the year, —2°, was recorded. In the suburbs —15° was reported.

March, 1910.

The driest and warmest March in 50 years. The precipitation amounted to only .14 in., and more than half of this fell on the 30th. The smallest amount previous to this occurred in 1860 with .33 in.—the normal for this month being 3.3 inches. There were 22 clear days and only 2 cloudy days, and the average daily sunshine was 86.7%, the largest percentage ever recorded here. The mean temperature for the month 57°.5 was no less than 13°.5 above the normal. On seven successive days, from the 22nd to the 29th, the mercury rose above 80°, reaching 89° on the 23rd. The temperature was at freezing point only three times, but never lower. This abnormally warm weather was largely due to the fact that the centers of storm areas during the month almost invariably passed north of the city, most of them along the Canadian border, thus inducing prevailing winds from the Gulf and the plains of the Southwest.

April, 1910.

Extreme changes in temperature and a very destructive frost late in the month were the features of the weather during April. The maximum, 91° on the 29th, was exceeded only twice before, 93° having been recorded in 1855 and 1866. The period from the 23rd to the 26th was a ruinous one for almost all vegetation in this region. A tramp "low," hanging over the Lake region for three full days, brought on a killing frost on the 23rd; on the 24th the minimum temperature of 25°, the absolute minimum for the 3rd decade in April, together with an unseasonable, heavy snowfall of 2.5 in. The precipitation was 1.16 in. above the normal. Measurable amounts fell on 17 days. There were 5 thunderstorms during the month.

May, 1910.

The warm period with which April closed extended over into May for a few days. During the rest of the month, however, the temperature was abnormally low for the season. The mean for the month 61°, was 5° below the average. The mercury reached the 80° mark only four times and on half the days of the month did not rise above 65°. Rain occurred on 15 days, the largest number in May for over 20 years. The total precipitation was 5.35 in., almost an

inch above the normal amount. On the night of the 22nd to the 23rd 2.12 in. fell within 12 hours. Seven thunderstorms passed over the city, one of them causing considerable damage in the suburbs on the morning of the 2nd.

June, 1910.

The first decade of the month was decidedly cool, the mean daily temperature being constantly below 70°. Of the 5.20 in. of rain which fell during the month, 3.47 in. arrived during the first period. High temperatures prevailed during the rest of the month, however, the mean after the 14th being almost constantly above 80°. On nine consecutive days, from the 18th to the 26th, the maximum temperature was at or above 90°; on the 26th it reached 93°. The fact that on some of the days the movement of the wind was only four miles an hour made the heat all the more noticeable. There were 10 thunderstorms during the month.

July, 1910.

An examination of the temperature records for July would make it appear that the month was comparatively cool—the mean being 78°, one degree below the normal, the maximum 90° on only six days —but the high relative humidity detracted much from its agreeableness. The rainfall, too, was excessive, the total 6.01 in. being 2.37 in. above the average. This amount was distributed over 13 days and most of it came with thunderstorms, of which there were 10 during the month. At 7 P. M. on the 25th the most severe thundersquall of the year struck the city from the Northwest, its path lying directly over the observatory. The wind reached a maximum velocity of 60 miles an hour, and 1.10 in. of rain fell within 12 hours. The day had been very hot, its maximum 96° being the highest recorded during the month. Within half an hour the temperature dropped from 94° to 65°.

August, 1910.

The temperature exceeded 90° on only six scattered days, reaching 94° on the 30th. The mean was 75°.7, whereas the normal is 78°. Appreciable amounts of rain fell on 7 days, making a total of 1.92 in.; the average quantity for August is 2.44. As in the preceding month, the relative humidity was high, and fogs and heavy dew were frequent. Five thunderstorms passed over the city and three others occurred in the immediate vicinity, but none of them were violent

On the 23rd the ground temperature reached its annual maximum, 68°.

September, 1910.

With no well-defined distribution of atmospheric pressure, heavy showers occurred on the 4th of the month, creating the year's record for maximum precipitation within 24 hours. The total for the day was 3.64 in. In all 5.61 in. of rain fell during the month, whereas the normal amount for September is 3 in. The mean temperature, 71°, was 1° above the average. Small ranges in temperature and plenty of sunshine—63%—were responsible for the general agreeableness of the month.

October, 1910.

Twenty-three clear days, an average daily sunshine of 79%, and a mean temperature of 2°.5 above the normal are evidences of the very pleasant weather which prevailed during October—St. Louis' favorite month. The rainfall, indeed, exceeded the normal amount by almost an inch, but by far the greater portion fell within the brief period from the 3rd to the 6th. On the 5th 1.80 in. fell within 24 hours. The first killing frost delayed until the 29th, although there had been a heavy frost a week previous. The first snow fell on the afternoon of the 28th, but the amount was not measurable. No thunderstorms occurred during the month.

November, 1910.

November was a close rival of March in the matter of clear, dry weather. As in March, there were only three days on which appreciable amounts of precipitation occurred, and the total was only .19 in., of which .16 in. fell during a thunderstorm on the 27th. With the exception of November, 1865, when the total precipitation was only .08 in., this is the driest November on record since 1839. Normally almost 3 in. fall during this month. There was not even a trace of snow during the entire month. Without any decided extremes, the temperature was low; the mean, 42°.5, was 2°.5 below the normal. The thermometer registered higher than 60° on only 6 scattered days, and failed to reach 50° on half the days of the month.

December, 1910.

Freezing weather was practically uninterrupted throughout the month, the mean being 32°.5, about 3° below normal. The minimum temperatures, however, were not unusually low. Precipitation was about 1 in. below the average amount. The total snowfall was 2.20 in.

JANUARY 1910

Date	Mean Atmospheric Pressure	Mean Temperature F°	Maximum Temperature F°	Minimum Temperature F°	Mean Vapor Pressure In Inches	Mean Relative Humidity	Rain in Inches	Melted Snow in Inches	Sunshine	Prevailing Direction	Total Mileage	Character of Day	Miscellaneous Phenomena
1	29.90	46°	61°	38°	.2950	.93	.00	.00	1.00	S	148	Clear	≡²
2	30.14	27	41	25	.1210	.84	.00	T	.00	NW	131	Cloudy	
3	30.52	22	29	20	.0789	.67	T	T	.05	N	250	Cloudy	Sleet
4	30.34	21	26	15	.0922	.89	.08	.04	.00	SE	282	Cloudy	Sleet
5	30.23	18	32	15	.0702	.74	.75	.00	.45	NW	214	Cloudy	Sleet
6	30.28	8	15	3	.0442	.76	.00	.00	.00	NW	169	Cloudy	
7	30.33	23	33	10	.0958	.76	.00	.00	1.00	SE	144	Clear	
8	30.40	32	38	24	.0990	.55	.00	.00	1.00	S	144	Clear	
9	30.68	21	35	17	.0723	.67	.00	.00	.63	N	142	P.Cl.	
10	30.61	27	34	17	.0910	.67	.00	.00	.78	SE	303	Clear	
11	30.47	38	41	29	.1370	.60	T	.00	.00	SE	160	Cloudy	
12	30.34	39	41	36	.2070	.89	1.32	.00	.00	S	167	Cloudy	≡²
13	30.18	37	45	32	.2050	.90	.45	.00	.00	NW	281	Cloudy	
14	30.42	30	34	27	.1190	.72	.00	.00	.20	NW	318	Cloudy	
15	30.50	28	31	26	.1210	.82	.00	.00	.00	SE	165	Cloudy	
16	30.25	31	33	28	.1670	.96	.06	.00	.00	SE	251	Cloudy	
17	29.72	47	54	33	.3010	.93	.07	.00	.00	SE	214	Cloudy	
18	29.93	37	55	31	.1690	.77	.08	.00	1.00	W	314	Clear	
19	30.06	47	58	37	.1990	.61	.00	.00	1.00	N	178	Clear	☿
20	29.97	39	58	34	.1820	.81	.00	T	.04	NW	377	Cloudy	
21	30.03	27	35	24	.0825	.60	.00	.00	1.00	NW	476	Clear	Comet seen
22	29.85	28	36	15	.0783	.57	.00	.00	1.00	NW	237	Clear	
23	29.83	39	44	35	.1750	.69	.00	.00	1.00	NW	159	Clear	
24	30.13	30	40	27	.1390	.84	.00	.00	.60	NW	102	P.Cl.	
25	29.85	40	49	30	.1700	.70	.00	.00	1.00	N	380	Clear	
26	29.56	49	58	46	.1830	.54	.00	.00	1.00	SE	488	Clear	
27	29.86	37	47	31	.1570	.73	.00	.00	.90	NW	246	Clear	⊕ ☿
28	29.71	35	40	26	.1430	.71	.00	.00	1.00	NW	149	Clear	⌐²
29	29.90	32	39	30	.1480	.83	.00	T	.00	NW	132	Cloudy	
30	30.04	24	33	19	.0953	.78	.00	.10	.70	NW	222	P.Cl.	
31	30.23	24	29	18	.0994	.79	.00	.00	.60	SE	172	P.Cl..	
	30.14	32	40²	25⁸	.1399	.75	2.81	.14	.51	NW	7115		

FEBRUARY 1910

Date	Mean Atmospheric Pressure	Mean Temperature F°	Maximum Temperature F°	Minimum Temperature F°	Mean Vapor Pressure In Inches	Mean Relative Humidity	Rain in Inches	Melted Snow In Inches	Sunshine	Prevailing Direction	Total Mileage	Character of Day	Miscellaneous Phenomena
1	30.12	37°	48°	26°	.1590	.74	.00	.00	.80	S	292	Clear	☐°
2	29.93	47	54	41	.2680	.84	.05	.00	.30	SE	194	Cloudy	
3	30.24	32	45	31	.1580	.85	.32	.05	.30	NW	268	Cloudy	
4	30.27	34	43	24	.1510	.79	.00	.00	1.00	W	208	Clear	☐²
5	30.11	35	44	28	.1240	.66	.00	.00	.80	NW	149	Clear	☐²
6	30.44	23	35	17	.0725	.61	.00	.00	1.00	N	162	Clear	
7	30.29	31	36	22	.0953	.58	.00	.00	.80	SE	207	Clear	
8	30.05	40	49	33	.1610	.69	.00	.T	.90	NW	184	Clear	
9	30.14	28	39	26	.1068	.71	.00	.45	.60	NW	245	P.Cl.	
10	30.28	29	38	17	.1124	.72	.00	.00	1.00	SE	129	Clear	☐²
11	30.11	35	40	30	.1217	.63	.00	.00	.40	SE	147	Cloudy	
12	30.17	19	35	12	.0623	.65	.00	.03	.90	NW	372	Clear	
13	30.30	29	39	16	.1080	.67	.00	.00	.90	W	213	Clear	
14	29.90	45	58	34	.1540	.50	.00	.00	.95	S	264	Clear	
15	29.66	53	64	42	.2550	.61	T	.00	.30	N	365	Cloudy	Sleet
16	30.23	17	45	16	.0785	.89	.00	1.15	.00	N	335	Cloudy	
17	30.28	8	16	5	.0476	.81	.00	.23	.05	NW	341	Cloudy	
18	30.35	12	22	-2	.0528	.56	.00	.00	1.00	SE	236	Clear	≡¹
19	30.27	23	33	9	.0739	.64	.00	.00	1.00	SE	277	Clear	☃
20	29.86	34	40	22	.1416	.69	T	.00	.00	SE	313	Cloudy	
21	30.06	27	39	25	.1160	.79	.00	.03	.00	N	225	Cloudy	
22	30.22	25	28	19	.1099	.81	.00	.07	.30	NW	171	Cloudy	Frozen Fog
23	30.61	4	28	-1	.0247	.55	.00	.00	.07	N	237	Cloudy	C.W.
24	30.55	16	24	3	.0415	.47	.00	.00	1.00	N	152	Clear	
25	30.24	29	37	16	.0921	.55	.00	.00	.85	SE	282	Clear	⊕
26	29.91	42	43	38	.2410	.91	1.03	.00	.00	SE	242	Cloudy	
27	30.05	31	43	27	.1205	.67	.00	.00	.70	NW	211	P.Cl.	
28	29.99	33	40	27	.1470	.79	.00	.00	.85	SE	184	Clear	≡²
	30.17	29°	39°	21°	.1213	.69	1.40	2.01	.60	SE	6606		

MARCH 1910

Date	Mean Atmospheric Pressure	Mean Temperature F°	Maximum Temperature F°	Minimum Temperature F°	Mean Vapor Pressure In Inches	Mean Relative Humidity	Rain in Inches	Melted Snow in Inches	Sunshine	Prevailing Direction	Total Mileage	Character of Day	Miscellaneous Phenomena
1	29.97	44°	51°	33°	.2360	.75	.01		.49	SE	162	Cloudy	≡²
2	30.07	54	70	33	.2420	.61	.00		1.00	W	142	Clear	≡²
3	30.10	56	65	44	.2500	.59	.00		1.00	SE	159	Clear	
4	29.98	65	76	49	.2920	.51	.00		1.00	W	119	Clear	
5	29.88	70	80	57	.2950	.43	.00		.70	SE	155	P.Cl.	
6	30.02	57	74	50	.1720	.39	.00		.95	NW	332	Clear	
7	30.06	47	56	36	.1270	.40	.00		1.00	NW	298	Clear	
8	29.94	47	55	37	.1670	.54	.00		1.00	N	139	Clear	
9	30.11	38	50	34	.1520	.69	.00		.00	N	140	Cloudy	
10	30.18	39	46	32	.1014	.43	.00		.81	N	177	Clear	
11	30.02	47	60	31	.1590	.51	.00		1.00	N	199	Clear	☐²
12	30.15	46	55	36	.1680	.58	.00		.93	NW	155	Clear	
13	29.98	58	67	47	.1860	.44	.00		1.00	N	283	Clear	
14	30.26	38	54	35	.1154	.51	.00		1.00	N	260	Clear	
15	30.26	39	48	27	.1031	.47	.00		1.00	W	90	Clear	
16	30.00	55	66	38	.1570	.38	.00		1.00	NW	224	Clear	
17	30.05	56	66	41	.1430	.37	.00		1.00	NW	105	Clear	
18	30.11	60	71	48	.2390	.45	.00		.85	SE	103	P.Cl.	
19	30.07	63	72	52	.2870	.52	.00		1.00	SE	157	Clear	
20	30.06	63	71	55	.3360	.59	.05		1.00	N	217	Clear	☈
21	30.12	56	69	36	.2320	.51	.00		1.00	SE	157	Clear	
22	29.90	74	86	57	.2880	.37	T		.75	E	188	P.Cl.	
23	29.93	75	89	57	.2970	.41	.00		1.00	SE	122	Clear	
24	29.94	76	87	63	.2700	.31	.00		.70	W	204	P.Cl.	
25	30.10	72	80	61	.2070	.27	.00		1.00	SE	203	Clear	
26	29.91	71	80	61	.3180	.45	.00		1.00	SE	204	Clear	
27	29.91	76	87	61	.2490	.31	.00		1.00	SW	217	Clear	
28	30.00	75	86	64	.2800	.33	.00		1.00	SE	212	Clear	
29	29.94	72	79	63	.3870	.50	.00		.60	SE	310	P.Cl.	≡¹
30	30.04	66	79	58	.3630	.57	.08		.50	NW	330	P.Cl.	
31	30.27	56	63	47	.2010	.48	.00		.60	NW	126	P.Cl.	
	30.04	58°	69	46	.2264	.47	.14	00	.87	SE	6168		

APRIL 1910

Date	Mean Atmospheric Pressure	Mean Temperature F°	Maximum Temperature F°	Minimum Temperature F°	Mean Vapor Pressure in Inches	Mean Relative Humidity	Rain in Inches	Melted Snow in Inches	Sunshine	Prevailing Direction	Total Mileage	Character of Day	Miscellaneous Phenomena
1	30.19	61°	70°	49°	.2020	.40	.00		1.00	NW	94	Clear	
2	30.01	63	71	55	.3150	.55	.10		.30	SE	165	Cloudy	☂3PM
3	29.81	64	72	56	.4540	.76	.17		.00	SE	251	Cloudy	
4	29.77	68	72	65	.4410	.63	.03		.00	SE	275	Cloudy	☂7PM
5	29.61	51	68	41	.3080	.76	1.21		.50	W	380	Cloudy	☂ Δ10AM
6	29.92	51	55	39	.1950	.54	T		.60	NW	309	P.Cl.	
7	30.09	57	61	41	.2090	.48	.00		.88	SE	122	Clear	
8	30.06	66	78	50	.2810	.46	.00		.72	SE	116	Clear	
9	30.10	68	76	56	.2800	.44	.00		1.00	NW	115	Clear	
10	30.00	69	79	56	.3040	.45	.00		1.00	SE	180	Clear	
11	29.77	62	73	59	.4390	.78	.14		.30	SE	180	Cloudy	
12	29.86	55	60	51	.3350	.77	.04		.30	N	231	Cloudy	
13	29.98	61	70	47	.2350	.45	.00		1.00	SE	116	Clear	
14	29.76	66	76	54	.3830	.60	.15		.67	SE	323	P.Cl.	☂ Δ7PM
15	29.64	67	77	58	.5000	.78	1.11		.46	N	176	P.Cl.	☂ 6PM
16	29.67	42	66	37	.2020	.77	.93		.00	NW	255	Cloudy	
17	29.69	40	42	37	.1730	.70	.05		.07	W	241	Cloudy	
18	29.83	36	40	31	.1700	.81	.04	.05	.00	NW	319	Cloudy	Δ¹
19	29.98	43	52	37	.2080	.73	.01		.30	NW	344	Cloudy	
20	29.94	51	63	37	.2030	.55	T		1.00	NW	206	Clear	☐°
21	29.77	63	71	47	.2720	.48	.00		.66	SE	259	P.Cl.	
22	29.69	58	72	47	.3100	.63	.10		.14	W	335	Cloudy	
23	29.87	32	34	28	.1260	.72	.00	.05	.00	NW	363	Cloudy	Killing frost
24	29.93	33	38	25	.1170	.64	.00	.25	.18	N	251	Cloudy	" "
25	29.96	40	44	32	.1820	.77	.00		.02	N	213	Cloudy	
26	29.82	45	49	37	.2190	.76	.18		.12	NW	273	Cloudy	
27	30.02	60	68	46	.2910	.58	.01		1.00	N	225	Clear	
28	29.98	70	84	50	.3060	.45	.00		1.00	SE	198	Clear	
29	29.68	79	91	62	.2080	.36	.00		1.00	S	260	Clear	⊕
30	29.73	76	86	68	.3690	.41	.00		.80	SE	189	Clear	
	29.87	56⁵	65³	46°	.2779	.60	4.27	.35	.50	SE	6864		

MAY 1910

Date	Mean Atmospheric Pressure	Mean Temperature F°	Maximum Temperature F°	Minimum Temperature F°	Mean Vapor Pressure in Inches	Mean Relative Humidity	Rain in Inches	Melted Snow in Inches	Sunshine	Prevailing Direction	Total Mileage	Character of Day	Miscellaneous Phenomena
1	29.83	66°	78°	55°	.4500	.69	.18		.21	SE	144	Cloudy	☂ 9:35
2	29.89	65	82	55	.4790	.80	1.07		.35	N	285	Cloudy	3AMΔ≡²
3	30.28	51	58	43	.2440	.66	.34		.21	N	246	Cloudy	
4	30.35	53	60	40	.1980	.50	.00		.74	NE	117	P.Cl.	
5	30.30	55	60	43	.1940	.45	.00		.60	SE	178	P.Cl.	
6	30.08	52	59	49	.2480	.65	.12		.00	E	240	Cloudy	
7	29.65	51	55	47	.3070	.84	.50		.00	SE	294	Cloudy	☂dn
8	29.76	51	56	45	.2950	.80	.02		.00	W	236	Cloudy	≡¹
9	29.92	68	78	50	.3160	.48	.00		1.00	W	193	Clear	
10	29.87	71	78	59	.4200	.56	.03		.64	SE	114	P.Cl.	☂AM and PM
11	29.77	60	73	55	.4470	.89	.30		.07	N	251	Cloudy	☂
12	30.11	56	63	46	.2210	.52	.00		1.00	NW	222	Clear	Red Moon
13	30.16	57	64	43	.1900	.43	.00		1.00	NW	191	Clear	" "
14	30.17	58	64	49	.1880	.40	.00		.76	SE	174	Clear	≡°
15	30.07	56	62	50	.2450	.58	.02		.08	SE	294	Cloudy	☭
16	29.99	63	67	51	.4040	.72	.05		.35	SE	300	Cloudy	
17	29.94	63	66	50	.3460	.63	.26		.50	NW	310	P.Cl.	☂ dn ☿
18	30.04	66	75	50	.2890	.49	.00		1.00	SE	167	Clear	☿
19	29.84	68	76	56	.3700	.55	T		.50	SE	216	P.Cl.	
20	29.67	75	86	62	.4690	.61	.07		.86	SE	186	Clear	
21	29.76	72	77	65	.5490	.69	T		.50	SE	213	P.Cl.	
22	29.77	66	73	60	.5230	.82	.18		.14	SE	187	Cloudy	
23	29.76	62	65	60	.4470	.82	2.12		.04	NW	243	Cloudy	
24	29.76	65	70	56	.2980	.50	.00		.94	NW	188	Clear	☭
25	29.98	64	70	51	.2640	.45	.00		.93	NW	172	Clear	
26	30.09	67	72	56	.3130	.48	.00		.62	NE	103	P.Cl.	
27	30.26	61	66	54	.2750	.51	T		.21	SE	233	Cloudy	
28	30.15	73	82	58	.3980	.50	T		1.00	SE	312	Clear	
29	30.04	73	80	65	.4000	.52	.09		1.00	NW	275	Clear	☂5AM
30	29.92	67	72	58	.3390	.51	T		.70	NW	230	P.Cl.	
31	29.81	65	72	52	.2480	.42	.00		1.00	NW	276	Clear	
	29.96	62⁶	69⁶	52⁷	.3347	.60	5.35	.00	.55	SE	6790		

JUNE 1910

Date	Mean Atmospheric Pressure	Mean Temperature F°	Maximum Temperature F°	Minimum Temperature F°	Mean Vapor Pressure in Inches	Mean Relative Humidity	Rain in Inches	Melted Snow In Inches	Sunshine	Prevailing Direction	Total Mileage	Character of Day	Miscellaneous Phenomena
1	29.71	66°	74°	55°	.2670	.43	.00		.95	NW	258	Clear	
2	29.70	61	70	54	.2730	.57	T		.47	NE	147	P.Cl.	
3	30.00	52	62	48	.2920	.75	.05		.14	SE	199	Cloudy	☂11:20AM
4	29.89	61	67	53	.4290	.80	1.14		.00	SE	187	Cloudy	☂ dn
5	29.85	65	71	58	.3750	.63	.35		.50	N	177	P.Cl.	☂ dn
6	29.92	66	71	57	.3800	.60	T		.40	NW	143	P.Cl.	
7	30.11	62	68	52	.2990	.54	.00		.60	E	149	P.Cl.	
8	29.93	66	73	61	.3930	.62	.22		.50	SE	270	P.Cl.	
9	29.76	67	72	60	.5140	.76	1.21		.27	SE	170	Cloudy	☂2PM Δ
10	29.79	65	71	59	.4400	.72	.50		.27	NE	171	Cloudy	
11	29.96	69	77	55	.2700	.40	.00		1.00	N	157	Clear	
12	30.00	73	80	57	.3010	.39	.00		1.00	SE	70	Clear	
13	30.11	72	82	61	.3650	.48	T		.70	N	139	Clear	☂ 2:50PM
14	30.12	71	84	60	.4130	.57	.28		.90	NW	165	Clear	☂ 6:45PM
15	30.03	78	86	63	.4660	.48	.00		.90	NW	122	Clear	
16	30.00	80	88	66	.4910	.50	.00		.95	S	100	Clear	
17	29.93	81	89	69	.5190	.51	.00		1.00	SW	151	Clear	
18	29.92	82	91	70	.5940	.55	.00		.90	W	155	Clear	
19	29.89	79	91	68	.6090	.62	.16		.60	W	122	P.Cl.	☂ 3PM
20	29.86	82	91	66	.5640	.53	.00		1.00	NW	167	Clear	
21	29.83	81	91	68	.5970	.56	.00		1.00	NE	123	Clear	
22	29.87	82	89	71	.6480	.60	T		.66	SE	116	P.Cl.	
23	29.89	85	90	73	.6180	.53	.00		.80	S	88	Clear	
24	29.94	82	91	73	.6470	.61	T		.60	NW	100	P.Cl.	☂ 1:35PM
25	29.93	84	92	72	.6610	.57	.00		.75	SE	105	Clear	
26	29.92	81	93	75	.6880	.66	T		.60	W	112	P.Cl.	☂ 4:10PM
27	29.87	76	82	69	.7320	.83	1.28		.20	E	133	Cloudy	☂ dn
28	29.85	80	87	69	.5560	.58	.01		.70	NE	103	Clear	
29	29.92	82	90	68	.5890	.55	.00		.80	E	91	Clear	
30	29.91	80	87	70	.6540	.65	.00		.50	NE	84	P.Cl.	
	29.91	73⁷	78³	63³	.4881	.59	5.20	00	.66	E	4274		

JULY 1910

Date	Mean Atmospheric Pressure	Mean Temperature F°	Maximum Temperature F°	Minimum Temperature F°	Mean Vapor Pressure in Inches	Mean Relative Humidity	Rain in Inches	Melted Snow in Inches	Sunshine	Prevailing Direction	Total Mileage	Character of Day	Miscellaneous Phenomena
1	29.84	81°	87°	73°	.7160	.73	.00		.60	SE	111	P.Cl.	
2	29.78	76	83	67	.6990	.79	.50		.30	E	116	Cloudy	☂8:50AM
3	29.72	75	83	70	.6850	.79	1.68		.20	E	101	Cloudy	☂9:30AM
4	29.80	72	78	65	.5990	.74	.02		.60	N	189	P.Cl.	
5	29.83	78	84	69	.6320	.76	.58		.30	E	97	Cloudy	
6	29.84	79	89	71	.7410	.75	.09		.66	N	139	P.Cl.	☂4:40PM
7	29.78	83	90	70	.5670	.51	.00		.90	NW	120	Clear	
8	29.78	85	93	72	.6160	.53	.00		.95	W	123	Clear	
9	29.85	77	87	72	.7170	.77	.07		.60	S	184	P.Cl.	☂12.Noon
10	29.96	72	81	67	.6310	.82	.27		.20	NW	126	Cloudy	☂ 5.AM
11	29.95	76	83	69	.7010	.77	T		.60	S	137	P.Cl.	
12	29.90	77	82	70	.6840	.75	.02		.57	W	182	P.Cl.	
13	30.03	77	85	67	.6100	.68	.00		.60	N	114	P.Cl.	
14	29.94	81	90	71	.7080	.68	.00		.57	S	167	P.Cl.	☂3.PM
15	29.83	74	81	72	.7180	.85	.51		.28	S	185	Cloudy	☂4:15PM
16	29.71	79	86	69	.7330	.75	.03		.65	NW	202	P.Cl.	
17	29.77	81	88	75	.7670	.73	.00		.76	N	171	Clear	
18	30.02	73	79	61	.4280	.54	.00		1.00	NE	182	Clear	
19	30.14	73	82	60	.3080	.50	.00		1.00	E	110	Clear	
20	30.09	75	82	62	.4600	.55	.00		1.00	E	75	Clear	
21	29.92	79	86	65	.5240	.54	.00		.86	SW	113	Clear	
22	29.86	80	87	70	.6160	.62	.00		.75	S	170	Clear	
23	29.83	82	89	73	.6860	.64	.00		.70	S	232	P.Cl.	
24	29.85	84	91	76	.8290	.70	.07		.50	W	224	P.Cl.	
25	29.89	88	96	77	.8380	.64	.T		.75	W	169	P.Cl.	☂Hurri-cane
26	29.89	73	91	65	.6690	.83	1.10		.20	SE	180	Cloudy	
27	29.77	87	94	72	.8400	.66	.00		1.00	W	212	Clear	
28	29.80	85	93	76	.7700	.63	.00		.76	S	156	Clear	
29	29.78	79	89	72	.7660	.79	1.07		.57	N	189	P.Cl.	☂
30	29.89	79	85	75	.5190	.53	.00		1.00	N	171	Clear	
31	29.95	80	88	67	.4880	.59	.00		.72	N	85	Clear	
	29.90	79	86⁵	70	.6634	.68	6.01	.00	.65	S	4732		

AUGUST 1910

Date	Mean Atmospheric Pressure	Mean Temperature F°	Maximum Temperature F°	Minimum Temperature F°	Mean Vapor Pressure In Inches	Mean Relative Humidity	Rain in Inches	Melted Snow in Inches	Sunshine	Prevailing Direction	Total Mileage	Character of Day	Miscellaneous Phenomena
1	29.92	80°	88°	68°	.5620	.54	.00		1.00	SE	123	Clear	
2	29.89	78	82	69	.6460	.69	.00		.50	SE	163	Cloudy	
3	29.82	76	85	69	.7180	.80	.31		.28	S	121	Cloudy	☈
4	29.91	77	84	71	.4890	.64	.00		.85	NW	206	Clear	☾²
5	29.91	74	81	61	.4330	.54	.00		.80	NW	117	Clear	
6	29.93	75	82	65	.5180	.61	.02		.43	W	69	P.Cl.	
7	29.92	67	73	65	.5490	.84	.88		.07	NE	122	Cloudy	
8	29.93	71	81	59	.5560	.77	.00		.64	S	143	P.Cl.	≡²
9	29.88	74	81	68	.6040	.73	.01		.50	W	181	P.Cl.	Rainbow
10	30.01	73	81	62	.4610	.58	.00		1.00	NW	133	Clear	☾¹
11	30.05	73	79	63	.4710	.60	.00		.21	N	65	Cloudy	≡¹
12	30.02	77	84	65	.4990	.55	.00		.71	SE	132	Clear	
13	29.95	78	86	68	.4940	.53	.00		.66	SE	115	P.Cl.	
14	29.90	80	89	70	.5970	.59	.00		.60	SE	112	P.Cl.	
15	29.87	81	88	73	.6920	.68	.05		.60	S	168	P.Cl.	☈1:50PM
16	29.86	82	92	73	.7410	.68	.00		.67	S	101	P.Cl.	
17	29.93	84	90	75	.7670	.68	.00		.67	S	105	P.Cl.	
18	30.04	76	84	73	.7160	.80	.51		.22	N	129	Cloudy	☈11:15PM
19	30.07	76	83	66	.6160	.69	.00		.74	NE	116	Clear	☾²
20	29.91	81	87	70	.6310	.60	.00		.81	S	106	Clear	≡¹
21	29.82	79	90	76	.7010	.72	.14		.59	S	145	P.Cl.	☈4:40PM
22	29.98	84	93	70	.7920	.68	.00		.74	S	220	Clear	≡°
23	29.76	79	86	73	.7250	.74	.00		.67	S	351	P.Cl.	☾² dn
24	29.77	82	90	73	.7830	.73	.00		.60	S	281	P.Cl.	
25	29.95	73	84	66	.5700	.69	T		.37	N	274	Cloudy	☾ dn
26	30.19	65	73	54	.2960	.50	.00		1.00	E	128	Clear	☾²
27	30.06	68	75	54	.3360	.52	.00		1.00	SE	118	Clear	≡°
28	29.97	73	83	57	.4240	.55	.00		1.00	SE	109	Clear	≡²
29	29.95	79	87	65	.5750	.59	.00		1.00	SE	175	Clear	≡°
30	29.94	82	94	70	.6490	.60	.00		1.00	NW	153	Clear	
31	30.01	74	83	67	.6030	.73	.00		.65	N	200	P.Cl.	☾ dn
	29.94	76°	84°	67	.5876	.65	1.92	.00	.66	S	4681		

SEPTEMBER 1910

Date	Mean Atmospheric Pressure	Mean Temperature F°	Maximum Temperature F°	Minimum Temperature F°	Mean Vapor Pressure in Inches	Mean Relative Humidity	Rain in Inches	Melted Snow in Inches	Sunshine	Prevailing Direction	Total Mileage	Character of Day	Miscellaneous Phenomena
1	30.01	71°	80°	66°	.5750	.78	T		.69	NE	148	P.Cl.	
2	29.86	75	84	65	.6560	.77	.04		.54	W	114	P.Cl.	☈ 2:25PM
3	29.78	73	79	67	.6240	.78	T		.20	S	130	Cloudy	☈8:45PM
4	29.76	73	78	67	.7410	.91	3.64		.15	SE	217	Cloudy	☈7:30PM
5	29.77	77	86	71	.7540	.82	.12		.38	S	185	Cloudy	☈6:30AM and 4:20 PM
6	30.02	75	80	68	.5970	.71	.08		.70	W	132	P.Cl.	
7	30.06	73	80	71	.7580	.92	.57		.38	SE	144	Cloudy	☈10:30PM to 5:15 PM
8	30.02	81	89	73	.7260	.70	.00		.60	NW	194	P.Cl.	☾
9	30.16	64	81	59	.3840	.65	.00		1.00	N	241	Clear	
10	30.06	64	71	53	.3510	.59	.00		1.00	SE	132	Clear	≡°
11	29.94	74	85	61	.5420	.64	.00		1.00	SE	229	Clear	≡°
12	30.04	79	90	72	.7170	.74	.00		.80	S	180	Clear	☾
13	30.17	68	78	62	.5490	.82	.00		.40	N	177	P.Cl.	≡²
14	30.27	66	73	60	.3720	.59	.00		.90	NE	180	Clear	
15	30.25	63	70	55	.3270	.57	T		.24	NE	87	Cloudy	
16	30.16	69	76	57	.3200	.48	T		.56	SE	148	P.Cl.	≡°
17	30.07	73	83	59	.4060	.53	.00		1.00	S	139	Clear	
18	30.00	77	88	63	.5530	.62	.00		.80	SW	126	Clear	
19	29.89	77	86	69	.6040	.65	.02		.50	NW	174	P.Cl.	
20	29.91	74	85	65	.6080	.75	.00		.80	NE	96	Clear	≡²
21	29.97	74	83	63	.4020	.54	.00		1.00	NE	103	Clear	≡¹
22	29.93	75	84	64	.4360	.52	.00		1.00	SE	150	Clear	≡°
23	29.92	72	77	66	.6690	.86	.39		.00	SE	136	Cloudy	
24	29.93	67	76	65	.5090	.79	.42		.25	NW	163	Cloudy	☈dn
25	29.95	66	73	58	.4890	.77	T		.30	SE	114	Cloudy	☾²
26	29.88	69	76	64	.5650	.80	.33		.25	W	161	Cloudy	☈2AM☌° ≡°
27	30.12	59	70	53	.3040	.62	.00		.80	N	169	Clear	
28	30.16	62	71	49	.3240	.60	.00		1.00	N	65	Clear	☾²
29	30.05	66	75	53	.3650	.63	.00		.85	SE	76	Clear	≡²
30	29.93	73	85	58	.5440	.67	.00		.90	S	172	Clear	☾²
	30.00	71	79°	62°	.5264	.69	5.61	00	.63	SE	4482		

OCTOBER 1910

Date	Mean Atmospheric Pressure	Mean Temperature F°	Maximum Temperature F°	Minimum Temperature F°	Mean Vapor Pressure in Inches	Mean Relative Humidity	Rain in Inches	Melted Snow in inches	Sunshine	Prevailing Direction	Total Mileage	Character of Day	Miscellaneous Phenomena
1	29.93	76°	86°	69°	.3360	.61	.00	.00	.70	W	136	Clear	◺²
2	29.91	75	87	62	.4780	.55	.00	.00	.60	SE	215	P.Cl.	
3	29.83	72	82	64	.5520	.71	.22	.00	.45	SE	272	Cloudy	◜
4	29.86	71	78	63	.6030	.81	.50	.00	.50	SE	255	P.Cl.	
5	29.83	69	72	67	.6550	.94	1.80	.00	.00	SE	182	Cloudy	.
6	30.15	56	67	50	.2810	.62	.43	.00	.70	N	269	Clear	
7	30.31	57	64	46	.2350	.52	.00	.00	1.00	NE	81	Clear	⌐°
8	30.20	59	69	47	.2840	.59	.00	.00	1.00	N	91	Clear	⌐° ≡°
9	30.16	63	73	50	.2610	.49	.00	.00	1.00	N	129	Clear	
10	30.14	60	68	47	.3350	.67	.00	.00	1.00	E	70	Clear	≡²
11	30.04	63	74	52	.3580	.67	.00	.00	1.00	SE	73	Clear	≡²
12	30.01	68	77	54	.3870	.61	.00	.00	1.00	SE	91	Clear	≡²
13	29.96	69	80	58	.4440	.65	.00	.00	1.00	SE	96	Clear	≡²
14	30.05	69	79	60	.5520	.78	.00	.00	1.00	SE	78	Clear	≡²
15	30.06	73	84	62	.5420	.69	.00	.00	1.00	NW	93	Clear	≡²
16	29.98	73	83	62	.5050	.65	.00	.00	1.00	W	94	Clear	≡²
17	29.90	73	84	62	.4820	.62	.00	.00	1.00	SW	107	Clear	≡²
18	29.82	73	83	62	.4880	.62	.00	.00	1.00	SE	184	Clear	≡²
19	29.75	66	80	57	.4410	.70	.00	.00	.50	S	253	P.Cl.	≡°
20	29.98	46	57	45	.2500	.80	.04	.00	.00	N	198	Cloudy	
21	29.91	44	46	42	.2320	.81	.15	.00	.05	W	204	Cloudy	
22	29.96	50	60	38	.1870	.55	.00	.00	1.00	NW	176	Clear	⌐°≡²
23	30.02	56	70	41	.2320	.53	.00	.00	1.00	S	124	Clear	≡²
24	29.84	60	69	51	.2900	.57	.00	.00	1.00	W	201	Clear	
25	29.89	58	65	50	.1740	.40	.00	.00	1.00	NW	221	Clear	
26	29.61	68	83	51	.2740	.42	.00	.00	1.00	S	251	Clear	
27	30.02	45	72	42	.1650	.52	.05	.00	.80	NW	393	Clear	
28	30.25	34	43	31	.1210	.62	.00	T	.20	NW	371	Cloudy	
29	30.39	37	46	27	.1080	.54	.00	.00	1.00	W	166	Clear	Killing frost
30	30.14	54	68	38	.1390	.36	.00	.00	1.00	S	254	Clear	
31	30.13	58	69	47	.2070	.43	.00	.00	1.00	S	204	Clear	
	30.00	61	71[6]	51[6]	.3483	.61	3.19	T	.79	SE	6532		

NOVEMBER 1910

Date	Mean Atmospheric Pressure	Mean Temperature F°	Maximum Temperature F°	Minimum Temperature F°	Mean Vapor Pressure in Inches	Mean Relative Humidity	Rain in Inches	Melted Snow in Inches	Sunshine	Peevailing Direction	Total Mileage	Character of Day	Miscellaneous Phenomena
1	29.93	57°	70°	44°	.2610	.55	.00	.00	.30	S	299	Cloudy	
2	30.26	39	47	33	.1067	.47	.00	.00	.95	NW	237	P.Cl.	
3	30.28	36	44	28	.0990	.49	.00	.00	1.00	N	129	Clear	≡²
4	30.11	38	40	35	.1450	.63	T	.00	.00	SE	267	Cloudy	
5	30.17	41	46	37	.1330	.55	T	.00	.50	NW	259	P.Cl.	
6	30.06	44	56	29	.1200	.47	.00	.00	1.00	W	136	Clear	
7	29.81	55	68	38	.1880	.46	.00	.00	1.00	W	167	Clear	
8	29.87	51	60	41	.1980	.55	.00	.00	.80	SE	209	Clear	
9	29.69	64	74	52	.3320	.56	.00	.00	.70	S	251	P.Cl.	
10	30.02	41	68	38	.1470	.59	.00	.00	.80	NW	306	Clear	
11	30.10	36	42	32	.0955	.47	.00	.00	1.00	NW	214	Clear	
12	30.17	36	41	29	.1170	.57	.00	.00	.00	SE	119	Smoky	
13	29.85	42	48	35	.1260	.49	.00	.00	.00	SE	220	Cloudy	
14	29.94	40	45	38	.1390	.56	.00	.00	.80	NW	324	P.Cl.	
15	30.20	34	39	33	.1280	.68	.00	.00	.00	N	188	Cloudy	
16	30.23	33	40	28	.1150	.65	.00	.00	.00	NW	127	Cloudy	
17	30.13	33	40	26	.1370	.72	.00	.00	.80	NW	65	Clear	≡²⌐²
18	30.07	42	50	28	.1290	.50	.00	.00	.50	W	100	P.Cl.	⌐²
19	30.15	36	47	27	.1390	.68	.00	.00	.80	NE	105	Clear	⌐²
20	30.04	43	54	31	.2000	.76	.01	.00	.70	SE	191	P.Cl.	≡°⌐¹
21	29.98	43	51	36	.2060	.74	.00	.00	.95	W	131	Clear	
22	30.00	42	52	29	.1680	.65	.00	.00	1.00	SE	214	Clear	≡²⌐²
23	29.85	54	59	47	.1690	.43	.00	.00	1.00	NW	227	Clear	
24	29.79	56	65	44	.1810	.39	.00	.00	1.00	NW	261	Clear	
25	30.02	48	56	38	.1600	.48	.00	.00	.50	NW	149	P.Cl.	
26	29.84	49	53	43	.2670	.72	.02	.00	.05	SE	315	Cloudy	◔
27	29.68	50	65	39	.3300	.86	.16	.00	.05	NW	293	Cloudy	◔≡° ⚧
28	30.00	32	39	25	.1233	.76	.00	.00	.95	NW	325	Clear	
29	30.09	30	34	25	.1140	.68	.00	.00	.70	NW	220	P.Cl.	
30	30.20	26	31	22	.0748	.56	.00	.00	1.00	NW	447	Clear	
	30.02	42[4]	50[8]	34[3]	.1617	.59	.19	.00	.63	NW	6291		

DECEMBER 1910													
Date	Mean Atmospheric Pressure	Mean Temperature F°	Maximum Temperature F°	Minimum Temperature F°	Mean Vapor Pressure in Inches	Mean Relative Humidity	Rain in Inches	Melted Snow in Inches	Sunshine	Prevailing Direction	Total Mileage	Character of Day	Miscellaneous Phenomena
1	30.24	22°	29°	16°	.0616	.55	.00	T	.10	NW	336	Cloudy	
2	30.26	26	32	16	.0790	.59	.00	.00	1.00	NW	169	Clear	
3	29.98	37	43	28	.1064	.53	.00	.00	.00	SE	204	Cloudy	
4	29.97	27	40	23	.1118	.76	.00	T	.00	NE	143	Cloudy	
5	29.88	30	32	27	.1450	.85	.00	.21	.00	N	277	Cloudy	
6	30.13	26	30	25	.0915	.71	.00	.00	.10	NW	235	Cloudy	
7	30.09	30	37	19	.1122	.67	.00	.00	1.00	W	158	Clear	
8	30.24	30	35	24	.0965	.59	.00	.00	.00	NE	66	Cloudy	
9	30.13	34	42	24	.1163	.60	.00	.00	.20	SE	150	Cloudy	
10	30.11	38	45	32	.1430	.63	.02	.00	1.00	NW	259	Clear	
11	30.34	32	40	28	.1170	.67	.00	.00	.40	NW	197	Cloudy	⊕
12	30.60	21	33	16	.0477	.53	.00	.00	1.00	N	177	Clear	⊕
13	30.70	27	34	16	.0867	.61	.00	.00	.50	SE	95	P.Cl.	⊓° ⊕
14	30.35	36	48	22	.0877	.46	.00	.00	1.00	S	159	Clear	⊓° ⊕
15	30.19	38	42	35	.1400	.61	.00	.00	1.00	NE	267	Clear	⊕
16	30.23	36	43	28	.1120	.55	.00	.00	1.00	SE	210	Clear	
17	30.11	44	53	32	.1600	.53	.00	.00	1.00	S	235	Clear	
18	29.98	37	46	26	.1390	.66	.00	.00	1.00	W	266	Clear	
19	29.76	39	46	31	.1240	.53	.00	.00	.90	NW	323	Clear	⊕
20	30.01	27	38	23	.0716	.50	.00	T	1.00	NW	351	Clear	
21	30.16	28	36	19	.0744	.48	.00	.00	1.00	SE	190	Clear	
22	29.99	35	36	31	.1590	.78	.03	T	.00	S	313	Cloudy	
23	30.00	31	38	27	.0930	.56	.00	.00	1.00	NW	330	Clear	
24	30.18	20	29	11	.0502	.48	.00	.00	1.00	NW	190	Clear	
25	30.05	35	41	22	.0981	.50	.00	.00	.00	SE	303	Cloudy	
26	30.10	36	45	29	.1250	.63	.00	.00	.85	NW	175	Clear	
27	29.97	39	45	31	.1900	.78	.26	.00	.05	SE	207	Cloudy	
28	29.85	41	52	38	.2010	.82	.27	.00	.00	NW	207	Cloudy	
29	29.94	34	40	27	.1750	.88	.30	.10	.00	NW	245	Cloudy	≡[1]
30	30.39	28	35	20	.1123	.71	.00	.00	1.00	NW	186	Clear	
31	30.14	36	44	28	.1323	.77	.00	.00	1.00	S	381	Clear	⊓°
	30.13	33	40	25	.1186	.63	.88	.31	.62	NW	7005		

MONTHLY AND ANNUAL METEOROLOGICAL SUMMARY 1910.

	Atmospheric Pressure			Temperature					Moisture		Precipitation		Wind		Weather				Miscellaneous Phenomena							
	Mean	Highest	Lowest	Maximum	Minimum	Mean Maximum	Mean Minimum	Monthly Mean	Mean Vapor Pressure	Mean Relative Humidity	Rain	Melted Snow	Prevailing Direction	Total Mileage	Average Daily Sunshine	Number of Clear Days	Number of Cloudy Days	Partly Cloudy Days	Solar Halos	Lunar Halos	Thunderstorms	Hail	Sleet	Fog	Frost	Killing Frost	Date of Killing Frost
JANUARY	30.14	30.71	29.43	61	3	40.2	25.8	32.0	.1399	.75	2.81	0.14	NW	7115	.51	12	13	6	1	2	0	0	2	2	1		
FEBRUARY	30.17	30.70	29.56	64	-2	39.5	21.5	29.0	.1213	.69	1.40	2.01	SE	6606	.60	14	11	3	1	1	0	0	1	6	5		
MARCH	30.04	30.35	29.82	89	27	69.0	46.0	58.4	.2264	.47	0.14	0.00	SE	6168	.87	22	2	7	0	1	1	0	0	4	1		
APRIL	29.87	30.26	29.56	91	25	65.3	46.6	56.5	.2779	.60	4.27	0.35	SE	6864	.50	11	15	4	1	0	5	2	1	0	3	APR	23
MAY	29.96	30.40	29.63	86	40	69.6	52.7	62.6	.3347	.60	5.35	0.00	SE	6790	.55	11	12	8	0	3	7	1	0	3	0		
JUNE	29.91	30.17	29.64	93	48	78.3	63.3	73.7	.4881	.59	5.20	0.00	E	4274	.66	15	5	10	0	0	10	1	0	0	0		
JULY	29.90	30.16	29.66	96	60	86.5	70.0	79.0	.6634	.68	6.01	0.00	S	4732	.65	12	6	13	0	0	10	0	0	1	0		
AUGUST	29.94	30.23	29.74	94	54	84.5	67.0	76.5	.5876	.65	1.92	0.00	S	4681	.66	13	6	12	0	0	5	0	0	4	0		
SEPTEMBER	30.00	30.31	29.70	90	49	79.7	62.5	71.0	.5264	.69	5.61	0.00	SE	4482	.63	14	9	7	0	0	8	1	0	3	0		
OCTOBER	30.00	30.46	29.52	87	27	71.5	51.5	61.0	.3483	.61	3.19	T	SE	5532	.79	23	5	3	0	0	0	0	0	11	4	OCT	29
NOVEMBER	30.02	30.35	29.61	74	22	50.8	34.3	42.4	.1617	.59	0.19	0.00	NW	6291	.63	16	8	6	0	2	1	1	0	5	5		
DECEMBER	13.13	30.76	29.70	53	11	40.0	25.0	33.0	.1186	.63	0.88	0.31	NW	7005	.62	18	11	2	0	5	0	0	0	0	3		
ANNUAL	30.01	30.76	29.43	96	-2	64.6	47.2	54.0	.3380	.62	36.97	2.81	SE	70439	.64	181	103	81	3	14	47	6	4	39	22		

THE WEATHER OF 1911.

January, 1911.

With the exception of a very brief period at the opening of the month, the weather during January was mild for the season. The mean temperature, 36°, was 4° above normal. On 7 days the maximum was 60° or over, the highest being 73° on the 11th. At 8 P. M. January 1, the mercury stood at 48°, but within 12 hours fell to 4° above zero. On the 3rd the minimum was 2° below zero, but by the morning of the 5th a thaw had set in. The total precipitation was 1.22 in., including 0.17 in. of melted snow, whereas the normal for January is 2.39 in. A very unseasonable phenomenon was the thunderstorm accompanied by hail on the morning of the 27th.

February, 1911.

February's break with weather traditions was still more radical than that of the preceding month. The maximum temperature, 83°, registered on the 1st, is the highest for February on record in St. Louis. Almost unprecedented, likewise, was the fall of 50° in temperature within 12 hours, from 74° on the evening of the 1st to 24° on the morning of the 2nd. The normal mean temperature, 34°, was exceeded by 5°. Precipitation was slightly above the average. The snowfall, unmelted, amounted to 17 in.

March, 1911.

Heavy damage to property was caused by a violent storm on the morning of the 7th, and by the heavy gale of the 27th. The former was accompanied by lightning and hail. The gale, for a brief period, attained a velocity of 60-70 miles an hour. On March 28, the ground temperature at a depth of 5 ft., which since January 10 had remained constant at 46°, began to rise. The month closed with a snowfall of 4 inches.

April, 1911.

The total precipitation during April was 6.92 in., which was double the usual amount for this month. During the period of April 27th-30th, 4.15 in. fell. Several very heavy downpours occurred: 0.35 in. within 5 minutes on the 29th, and 0.65 in. within 15 minutes on the 30th. At 4:05 P. M. April 13th a very severe storm broke over the western and northern residence sections of the city, causing damage to the extent of over $1,000,000. While there was no tornadic

formation, the wind attained high velocities and there was a very destructive fall of hail. At the observatory, which was on the eastern edge of the storm's path, the anemometer registered 58 miles per hour. Along the river front there was a heavy fall of rain, but no hail and only light winds. Within the storm area practically all windows facing the west were shattered. Many of the hailstones were larger than hen's eggs, some regular in shape, others composed of smaller stones frozen together. Florists and gardeners suffered heavily from the destruction of their greenhouses. Several storms of similar character occurred at various places just west of the Mississippi on the 12th and 13th. Temperature was about normal, and there was no frost during this month.

May, 1911.

The total precipitation was 1.85 in. Records show that smaller amounts fell during May in only two other years, 1879 and 1897. This amount was distributed over only six days, almost half of it falling during the violent thunderstorm on the 28th. The temperature was unusually high for May, especially during the latter half of the month. A maximum of 94° was reached on the 25th, 26th, and 28th, and 93° on the 24th and 27th.

June, 1911.

The normal mean temperature, 75°, was exceeded by 6°. On the 9th the maximum reached 98°.5 and on the 10th 99°, the highest temperature in St. Louis for the respective dates since 1836. The low relative humidity, however, generally 50% or less, made the extreme heat somewhat bearable. There were 15 clear days and an average daily sunshine of 76%.

July, 1911.

During the first two weeks the weather was unusually hot, even for July. The maximum temperature on the first 5 days was above 95°, and on the 3rd and 4th it reached 101°. The thermometer registered 90°, or over, on 17 days. The latter half of the month, however, was much cooler, 8 days having a mean temperature, which was 3 to 8 degrees below the seasonal average. The mean temperature for the month was only 2° above the normal. With the exception of 1890, this was the driest July since 1839, the total precipitation being only 0.74 in. Only two thunderstorms passed over the city. Twelve deaths and numerous prostrations were caused by the heat.

August, 1911.

The departure of the mean temperature from the normal by 1° was due to the very unseasonable cool weather which prevailed during the last third of the month. Prior to the 19th the heat, while not unusual, was rather oppressive, owing to the high percentage of humidity. Rain fell on 10 days, the total, 4.72 in., exceeding the average by 2.28 in.

September, 1911.

A mean temperature of 75°, 5° above the normal; rainfall amounting to 7.30 in.—the normal quantity being 3 in.; twelve thunderstorms, and an average relative humidity of 73%, characterize weather conditions during September. On the night of September 4th-5th, occurred the heaviest downpour of the year, 2.64 in.

October, 1911.

There were no striking features in weather conditions during this month. With only four perfect days, this month bears poor comparison with October, 1910, which had 20.

November, 1911.

The mean temperature during January, February, March, June and September was far above the normal, but that of November was not less than 5° below the average. Some very remarkable changes in temperature occurred on the night of November 11th-12th. On the afternoon of the 11th the maximum temperature had been 77°. When the cold wave, which had been advancing from the Northwest, reached St. Louis at 6:04 P. M., the thermometer still registered 76°. Then with the abrupt veering of the wind from southeast to northwest—the velocity suffering little diminution from 30 miles per hour—the temperature fell sharply. Within ten minutes it fell to 54°, and by 11 o'clock P. M. had reached 20°. The minimum recorded at 7 A. M. of the 12th was 13°. The total range within 12 hours was 63°; 22° within the first 10 minutes, and 56° within the first 5 hours.

December, 1911.

Fog, which prevailed on 10 days, was an unpleasant feature of the month's weather. On the 13th the average humidity was 100%. The mean temperature was below freezing on only four days. The minimum, 11°, occurred on the last day of the month, ushering in a period of the coldest weather for years.

JANUARY 1911.

Date	Mean Atmospheric Pressure	Mean Temperature °F	Maximum Temperature °F	Minimum Temperature °F	Mean Vapor Pressure in Inches	Mean Relative Humidity	Rain in Inches	Melted Snow in Inches	Sunshine	Prevailing Direction	Total Mileage	Character of Day	Miscellaneous Phenomena
1	29.79	44°	48°	37°	.2570	.91	.14	.00	.00	SE	258	Cloudy	
2	30.34	7	48	4	.0278	.51	.03	.10	.95	W	432	Clear	C.W.
3	30.45	3	7	-2	.0245	.57	.00	T	1.00	NW	307	Clear	
4	30.29	20	32	3	.0547	.55	.00	.00	.75	W	281	Clear	
5	30.06	34	44	20	.0887	.46	.00	T	.20	SE	248	Cloudy	
6	30.12	37	46	24	.1210	.57	.00	.00	.75	S	147	Clear	
7	29.87	44	54	37	.1340	.45	.00	.00	.90	S	172	Clear	☿
8	29.86	42	48	35	.1264	.47	.00	.00	.95	NW	392	P.Cl.	
9	30.36	32	39	23	.0954	.56	.00	.00	.80	SE	245	P.Cl.	♂
10	29.90	49	60	32	.2223	.58	.00	.00	.95	S	368	P.Cl.	♃
11	29.88	57	73	36	.3620	.74	.00	.00	.18	S	269	Cloudy	$\flat^2$
12	30.22	31	36	24	.1480	.86	T	.00	.00	NW	137	Cloudy	
13	30.18	35	40	31	.1930	.94	.43	.00	.00	N	127	Cloudy	$\equiv^2$ Δ^2
14	30.12	35	38	31	.1820	.89	T	.00	.00	N	150	Cloudy	$\equiv^\circ$
15	30.35	21	32	18	.0798	.73	.00	.00	.80	N	261	P.Cl.	
16	30.40	26	29	19	.0823	.60	T	.00	.00	E	168	Cloudy	Δ°
17	30.26	28	29	27	.1280	.86	.05	T	.00	N	156	Cloudy	Δ^2
18	30.35	26	30	22	.1150	.82	.00	.00	.00	W	86	Cloudy	Δ°
19	30.19	38	45	28	.1830	.80	.00	.00	.90	W	159	P.Cl.	
20	29.78	45	51	33	.2260	.75	.00	.00	.15	S	193	Cloudy	
21	29.99	30	50	26	.1046	.63	.01	.05	.00	N	282	Cloudy	
22	30.33	25	28	21	.0982	.66	.00	.02	.10	N	164	Cloudy	C.W.
23	30.57	33	41	22	.1030	.57	.00	.00	.90	S	133	Clear	$\sqcap^\circ$
24	30.41	41	46	32	.1210	.48	.00	.00	.30	SE	189	Cloudy	
25	30.19	47	49	42	.2640	.81	.00	.00	.00	SE	230	Cloudy	
26	29.94	62	68	48	.4220	.76	.00	.00	.30	S	275	Cloudy	
27	30.07	51	63	40	.3440	.88	.39	.00	.10	NW	257	Cloudy	Δ° ♅
28	30.37	42	47	36	.1880	.70	.00	.00	.30	SE	220	Cloudy	
29	29.79	59	67	46	.3800	.77	.00	.00	.20	S	309	Cloudy	
30	30.14	32	60	26	.1204	.67	.00	.00	.90	NW	229	P.Cl.	
31	29.76	50	62	34	.2060	.56	.00	.00	.75	SE	212	Cloudy	
	30.14	36^3	45^5	27^6	.1672	.68	1.05	.17	.45	S	7045		

FEBRUARY 1911.

Date	Mean Atmospheric Pressure	Mean Temperature F°	Maximum Temperature F°	Minimum Temperature F°	Mean Vapor Pressure in Inches	Mean Relative Humidity	Rain in Inches	Melted Snow in Inches	Sunshine	Prevailing Direction	Total Mileage	Character of Day	Miscellaneous Phenomena
1	29.63	62°	83°	44°	.2800	.54	.00	.00	1.00	SE	339	Clear	
2	30.21	31	74	24	.1050	.60	.00	.00	1.00	NW	286	Clear	C.W.
3	29.70	36	44	28	.1600	.73	T	.00	.05	SE	216	Cloudy	
4	30.11	35	41	27	.1060	.56	.00	.00	1.00	NW	199	Clear	⊕
5	29.97	34	39	32	.1460	.75	.33	.09	.00	SE	312	Cloudy	Δ²
6	29.94	33	41	30	.1390	.75	.09	.00	.00	W	290	Cloudy	
7	30.03	31	37	27	.1410	.87	T	.00	.00	SE	216	Cloudy	⊕
8	30.22	33	41	26	.1300	.70	.00	.00	.80	N	185	Cloudy	⊕ ⊕
9	30.21	34	40	29	.0872	.48	.00	.00	1.00	W	269	Clear	⊐²
10	30.36	30	38	20	.0754	.47	.00	.00	.50	SE	195	Clear	⊕ ⊕
11	30.19	39	45	34	.1660	.68	T	T	.15	SE	193	Cloudy	
12	30.08	40	43	39	.2030	.82	T	.00	.00	S	217	Cloudy	
13	29.80	50	57	39	.2960	.83	T	.00	.35	S	327	Cloudy	
14	29.71	53	58	48	.2700	.68	.25	.00	.50	W	292	P.Cl.	
15	30.04	55	69	38	.2630	.62	.00	.00	1.00	SE	212	Clear	
16	30.06	65	75	55	.5430	.79	.46	.00	.40	SE	216	P.Cl.	⊼
17	30.10	64	77	52	.4000	.70	.00	.00	1.00	S	263	P.Cl.	
18	30.23	37	52	35	.2050	.92	.67	.00	.00	N	225	Cloudy	Δ¹
19	30.06	29	36	27	.1430	.90	.13	1.20	.00	N	279	Cloudy	
20	30.29	22	28	21	.0799	.70	.00	.09	.65	W	301	Cloudy	
21	30.63	19	25	15	.0552	.57	.00	.00	.90	NW	261	Clear	
22	30.51	24	30	16	.0771	.61	.00	.00	1.00	W	305	Clear	
23	30.44	29	38	19	.1240	.78	.00	.00	1.00	W	147	Clear	≡°
24	30.23	35	45	24	.0892	.47	.00	.00	1.00	W	219	Clear	
25	29.87	44	51	34	.1347	.47	T	.00	.65	SE	227	Cloudy	
26	30.03	44	49	40	.1910	.68	T	.00	.80	W	266	Clear	
27	30.56	34	41	28	.1220	.65	.00	.00	.95	N	209	Clear	
28	30.56	29	37	24	.0997	.66	.00	.28	.37	N	187	Cloudy	
	30.13	39	47⁶	31⁸	.1725	.67	1.93	1.66	.56	W	6859		

MARCH 1911.

Date	Mean Atmospheric Pressure	Mean Temperature F°	Maximum Temperature F°	Minimum Temperature F°	Mean Vapor Pressure in Inches	Mean Relative Humidity	Rain in Inches	Melted Snow in Inches	Sunshine	Prevailing Direction	Total Mileage	Character of Day	Miscellaneous Phenomena
1	30.11	28°	34°	24°	.1203	.78	.00	.02	.87	W	199	Clear	
2	30.01	37	46	26	.1137	.54	.00	.00	1.00	W	240	Clear	⊐¹
3	29.92	49	59	37	.1770	.53	.00	.00	1.00	W	152	Clear	
4	30.32	41	55	32	.1330	.56	.00	.00	.95	N	171	Clear	
5	30.02	49	62	33	.2310	.63	.09	.00	.43	SE	316	P.Cl.	
6	30.18	47	64	44	.2340	.75	T	.00	.60	E	169	P.Cl.	
7	30.08	44	48	40	.2440	.84	.72	.00	.00	N	194	Cloudy	⊼ Δ² Hurricane
8	30.13	47	57	37	.2190	.71	.02	.00	.70	SE	197	P.Cl.	⊕
9	29.79	61	76	43	.3410	.64	.00	.00	.77	SE	244	Clear	
10	30.04	55	62	47	.3080	.50	.00	.00	.57	N	172	P.Cl.	⊕
11	29.61	64	80	48	.3120	.53	.00	.00	.51	SE	279	P.Cl.	
12	30.03	47	76	36	.2510	.85	.01	.00	.09	N	318	Cloudy	⊼
13	30.38	41	50	30	.1460	.58	.00	.00	.90	N	238	Clear	
14	30.14	46	56	32	.1200	.42	.00	.00	1.00	W	140	Clear	≡° ⊐
15	30.34	30	53	25	.0735	.44	.00	.00	1.00	NW	436	Clear	Gale
16	30.33	30	38	21	.0691	.41	.00	.00	.50	SE	201	Clear	
17	29.87	51	66	33	.2270	.60	.28	.00	.25	SE	282	Cloudy	
18	30.17	39	53	30	.1370	.59	.03	.00	1.00	E	166	Clear	
19	29.96	50	59	38	.1330	.42	.00	.00	1.00	W	265	Clear	
20	30.02	60	70	46	.1720	.33	.00	.00	1.00	W	190	Clear	
21	29.86	66	77	52	.1426	.37	.00	.00	.85	SE	218	P.Cl.	
22	30.00	56	69	52	.2500	.52	.04	.00	.80	N	336	P.Cl.	
23	30.41	45	52	35	.1370	.44	.00	.00	1.00	N	115	Clear	
24	30.36	43	52	33	.0910	.35	.00	.00	.95	SE	315	Clear	
25	30.03	55	70	37	.2030	.45	.00	.00	.85	SE	267	Clear	
26	29.67	54	61	48	.3560	.86	.81	.00	.05	S	292	Cloudy	
27	29.94	42	60	32	.1370	.56	.00	T	1.00	W	606	Clear	Δ¹ Hurricane
28	29.71	50	64	35	.1650	.45	T	.00	.35	SE	265	Cloudy	
29	29.54	45	57	36	.1870	.67	.01	.00	.45	W	441	P.Cl.	Gale
30	29.80	37	44	31	.1100	.50	.00	.00	.40	W	414	P.Cl.	
31	29.97	37	44	31	.1700	.80	.00	.40	.15	SE	99	Cloudy	
	30.01	46⁶	58⁸	36²	.1842	.57	2.01	.42	.68	SE	7937		

APRIL 1911.

Date	Mean Atmospheric Pressure	Mean Temperature F°	Maximum Temperature F°	Minimum Temperature F°	Mean Vapor Pressure in Inches	Mean Relative Humidity	Rain in Inches	Melted Snow in Inches	Sunshine	Prevailing Direction	Total Mileage	Character of Day	Miscellaneous Phenomena
1	30.12	43°	48°	33°	.1050	.41	.00		.40	NW	127	P.Cl.	
2	29.84	48	62	37	.1860	.55	T		.35	S	338	Cloudy	☈ ⊕ ◑
3	29.86	46	50	41	.2630	.85	.37		.00	N	174	Cloudy	☾ ☰²
4	29.42	61	69	48	.3410	.71	.16		.05	E	183	Cloudy	☈ ☰²△
5	29.74	47	55	42	.2380	.74	.00		.35	W	279	Cloudy	
6	29.66	49	74	42	.2890	.77	.00		.45	S	387	P.Cl.	◑
7	30.13	40	46	33	.1100	.46	.00		.40	E	131	P.Cl.	
8	30.19	47	54	40	.1670	.54	.00		.80	N	173	P.Cl.	
9	30.42	47	54	38	.1820	.59	.00		.85	E	159	Clear	
10	30.26	51	59	40	.1770	.48	.00		.85	SE	311	Clear	◐ ◑
11	29.96	51	56	48	.2970	.83	.18		.00	SE	303	Cloudy	
12	29.81	64	74	47	.3970	.71	.00		.75	SE	362	Clear	◑ Double ring
13	29.84	59	70	50	.4610	.92	1.30		.25	SE	346	Cloudy	☈△Hurri-cane
14	30.29	49	52	44	.1650	.48	.77		.75	N	265	Clear	☈
15	30.29	55	62	42	.1500	.37	.00		1.00	W	257	Clear	
16	30.07	60	69	44	.1510	.34	.00		1.00	W	139	Clear	
17	30.00	64	75	50	.1740	.32	.00		.85	W	199	P.Cl.	⊕
18	29.85	57	68	53	.4030	.84	.30		.00	S	234	Cloudy	
19	29.71	58	63	52	.2900	.63	.05		.62	W	369	Cloudy	☾
20	30.00	61	67	52	.3100	.60	.00		.58	N	159	Cloudy	
21	29.93	63	70	52	.2670	.51	.00		.86	W	196	Clear	
22	30.10	52	66	44	.1720	.45	.00		1.00	N	168	Clear	
23	30.30	52	59	41	.1610	.44	.00		1.00	NE	120	Clear	
24	30.28	53	60	41	.2250	.48	.00		.75	NE	109	Clear	☰¹
25	30.22	56	63	43	.2090	.48	.00		1.00	SE	159	Clear	⊕
26	30.09	63	73	52	.2600	.44	.00		.75	SE	218	Cloudy	
27	30.08	55	66	51	.3890	.89	.57		.00	SE	333	Cloudy	
28	30.00	62	73	56	.4660	.83	.00		.00	SE	221	Cloudy	
29	29.84	65	68	59	.5190	.85	1.53		.05	SE	223	Cloudy	☈ △
30	29.57	65	69	58	.4640	.81	1.80		.12	S	265	Cloudy	☈
	30.00	55	63²	45⁶	.2663	.61	6.92	.00	.53	SE	7035		

MAY 1911.

Date	Mean Atmospheric Pressure	Mean Temperature F°	Maximum Temperature F°	Minimum Temperature F°	Mean Vapor Pressure in Inches	Mean Relative Humidity	Rain in Inches	Melted Snow in Inches	Sunshine	Prevailing Direction	Total Mileage	Character of Day	Miscellaneous Phenomena
1	29.81	44°	64°	41°	.2170	.74	.06	T	.01	W	402	Cloudy	Gale
2	30.15	50	58	37	.1710	.47	.00		1.00	W	171	Clear	
3	30.21	49	54	44	.2140	.63	T		.03	W	108	Cloudy	☰¹
4	30.25	57	65	44	.2150	.50	.00		1.00	N	108	Clear	
5	30.31	59	66	46	.1850	.39	.00		1.00	E	92	Clear	☰¹
6	30.26	63	69	49	.2450	.44	.00		1.00	SE	171	Clear	☰¹
7	30.23	67	77	54	.2670	.41	.00		1.00	SE	177	Clear	
8	30.01	73	83	56	.3510	.44	.00		1.00	S	174	Clear	
9	29.79	79	89	67	.4250	.44	.00		.81	W	209	Clear	
10	29.66	77	86	66	.4540	.50	.00		1.00	S	283	Clear	
11	29.85	70	78	64	.3550	.50	.00		.85	W	181	P.Cl.	◐
12	30.04	72	80	59	.3450	.45	.00		.92	W	75	P.Cl.	⊕
13	30.10	75	84	63	.4100	.47	.00		.95	SE	244	P.Cl.	
14	30.08	75	84	64	.4120	.49	.00		.94	SE	290	Clear	
15	30.00	79	88	65	.4740	.47	.00		.85	SE	205	Clear	
16	29.95	80	88	69	.5010	.50	.00		.81	SE	175	P.Cl.	
17	29.92	82	90	71	.6060	.55	.00		.93	SE	166	P.Cl.	
18	29.75	82	91	72	.5750	.54	T		.74	SE	210	P.Cl.	
19	29.58	81	88	72	.6020	.58	.00		.87	SE	345	P.Cl.	
20	29.66	74	84	66	.5890	.71	.43		.54	S	213	P.Cl.	☈
21	29.77	72	79	65	.5490	.71	.15		.52	S	262	P.Cl.	
22	29.86	73	81	60	.4420	.54	.00		.71	S	166	Clear	
23	29.99	71	78	58	.3510	.48	.01		1.00	W	160	Clear	
24	30.02	82	93	63	.4660	.44	.00		1.00	S	160	Clear	
25	29.97	84	94	70	.5060	.45	.00		1.00	S	151	Clear	
26	29.93	85	94	71	.4910	.45	.00		1.00	S	160	Clear	
27	29.94	86	93	72	.5680	.46	.00		.95	S	133	Clear	
28	30.00	81	94	66	.6690	.64	.90		.58	S	130	P.Cl.	☈△
29	30.00	78	89	68	.5910	.65	.00		.86	N	107	Clear	☈
30	29.98	79	87	68	.6950	.70	T		.51	N	99	P.Cl.	
31	29.90	78	84	65	.6160	.71	.30		.80	W	199	P.Cl.	
	29.97	72⁸	76⁸	61	.4373	.53	1.85	T	.81	S	5740		

JUNE · 1911

Date	Mean Atmospheric Pressure	Mean Temperature F°	Maximum Temperature F°	Minimum Temperature F°	Mean Vapor Pressure in Inches	Mean Relative Humidity	Rain in Inches	Melted snow in inches	Sunshine	Prevailing Direction	Total Mileage	Character of Day	Miscellaneous Phenomena
1	29.97	73°	80°	62°	.4740	.57	.00		1.00	E	137	P.Cl.	
2	29.91	78	86	65	.5010	.53	.00		1.00	SE	251	P.Cl.	
3	29.91	89	98	74	.6770	.50	.00		.92	S	174	Clear	
4	29.91	89	98	77	.6550	.48	.00		1.00	W	169	Clear	
5	29.85	87	96	77	.6460	.52	.00		.80	W	185	Clear	⊕
6	29.93	76	88	66	.6390	.74	.28		.88	W	199	Cloudy	T 2AM.
7	30.00	82	88	69	.6380	.60	.00		1.00	N	100	Clear	
8	29.98	81	90	67	.5380	.51	.00		.95	SE	149	Clear	
9	29.90	88	98	72	.6310	.49	.00		1.00	SE	174	Clear	
10	29.81	89	99	76	.5380	.40	.00		1.00	S	193	Clear	
11	29.79	81	92	73	.5960	.58	T		.85	W	230	Clear	
12	29.79	73	83	65	.4250	.54	.00		.48	W	293	P.Cl.	
13	29.84	76	84	62	.4790	.54	.00		1.00	NW	148	P.Cl.	
14	29.85	73	81	63	.5220	.65	.15		.55	W	116	P.Cl.	
15	29.84	79	88	65	.4420	.47	.00		.81	SE	210	P.Cl.	
16	29.69	86	98	70	.5550	.47	.00		.60	SE	174	P.Cl.	
17	29.61	86	94	80	.5790	.48	T		.42	W	184	Cloudy	
18	29.79	70	84	66	.6390	.80	.15		.14	NW	164	Cloudy	
19	29.90	78	86	68	.5500	.58	T		.92	NE	142	Clear	
20	29.97	84	92	67	.5030	.45	.00		.98	E	125	Clear	
21	29.97	88	96	72	.5630	.44	.00		.95	SE	124	Clear	
22	29.95	85	93	75	.6330	.54	.00		.82	SE	171	Clear	
23	29.87	77	82	73	.6670	.79	.20		.17	SE	180	Cloudy	↯
24	29.84	77	83	70	.7660	.83	.35		.45	S	186	Cloudy	T 1PM.
25	29.79	82	87	73	.7350	.67	.05		.57	S	188	P.Cl.	T 9:25AM
26	29.81	81	87	75	.8300	.78	.18		.50	S	251	Cloudy	T 6:30AM
27	29.92	79	86	66	.5570	.59	.43		.80	W	179	Clear	T
28	29.95	81	87	66	.5850	.56	.00		.70	E	121	Clear	
29	29.99	84	92	71	.5780	.53	.00		.72	SE	175	Clear	
30	30.03	88	95	74	.6160	.48	.00		.95	SE	171	Clear	
	29.88	81°	90°	70°	.5919	.57	1.79	.00	.75	S	5273		

JULY 1911.

Date	Mean Atmospheric Pressure	Mean Temperature F°	Maximum Temperature F°	Minimum Temperature F°	Mean Vapor Pressure in Inches	Mean Relative Humidity	Rain in Inches	Melted Snow in Inches	Sunshine	Prevailing Direction	Total Mileage	Character of Day	Miscellaneous Phenomena
1	30.00	88°	96°	76°	.5860	.42	.00		.93	SE	205	Clear	
2	29.91	91	98	79	.6460	.44	.00		1.00	SE	121	Clear	
3	29.86	91	101	78	.6410	.47	.00		1.00	W	106	Clear	
4	29.88	92	101	80	.7250	.49	.00		1.00	S	125	Clear	⊕
5	29.88	90	99	80	.7410	.54	.00		1.00	S	150	Clear	
6	29.97	86	94	76	.6720	.56	.00		.83	S	174	P.Cl.	⊕
7	29.92	86	94	75	.6690	.56	.00		.89	SE	154	P.Cl.	
8	29.90	84	90	75	.6760	.60	.00		.75	SE	252	P.Cl.	
9	29.96	83	94	74	.6850	.63	.00		.85	S	213	P.Cl.	
10	29.97	84	92	77	.7750	.68	.00		.50	W	187	P.Cl.	
11	29.92	85	98	75	.7170	.60	T		.53	S	127	P.Cl.	T 4:15PM
12	29.99	82	91	70	.5520	.53	.00		1.00	N	177	Clear	
13	30.09	81	90	68	.4270	.42	.00		1.00	N	145	Clear	
14	30.09	84	91	69	.4660	.42	.00		1.00	N	96	Clear	
15	29.98	85	94	73	.4490	.37	.00		.85	SE	159	P.Cl.	
16	29.92	76	88	67	.5000	.59	.18		.65	W	228	P.Cl.	
17	29.95	72	78	63	.3560	.45	.00		.36	W	119	Cloudy	Meteor
18	29.92	76	82	69	.4710	.52	.00		.67	S	167	P.Cl.	
19	29.91	71	80	68	.6190	.83	.18		.07	S	128	Cloudy	
20	29.89	74	79	69	.6860	.82	T		.37	SE	127	Cloudy	
21	29.83	83	91	70	.5930	.60	.00		1.00	N	99	Clear	☽
22	29.88	82	90	68	.3880	.36	.00		1.00	E	95	Clear	
23	29.65	82	88	72	.6860	.64	.29		.50	SE	287	Cloudy	T 9:45AM
24	30.00	69	87	61	.3390	.50	.00		.95	NW	398	Clear	
25	30.08	70	78	57	.3080	.45	.00		.81	W	272	Clear	
26	30.10	73	81	56	.3600	.46	.00		1.00	N	100	Clear	☰
27	30.00	78	88	63	.4100	.43	.00		.64	SE	193	P.Cl.	
28	29.97	74	80	67	.5080	.62	T		.40	S	186	Cloudy	
29	29.95	78	84	69	.6990	.70	.09		.54	S	143	P.Cl.	↯
30	29.98	78	85	66	.6160	.67	.00		.70	SE	188	P.Cl.	☽
31	29.84	79	86	70	.6310	.66	T		.33	S	234	Cloudy	
	29.94	80°	89	70	.5667	.55	.74	.00	.74	S	5356		

AUGUST 1911

Date	Mean Atmospheric Pressure	Mean Temperature F°	Maximum Temperature F°	Minimum Temperature F°	Mean Vapor Pressure in Inches	Mean Relative Humidity	Rain in Inches	Melted Snow in Inches	Sunshine	Prevailing Direction	Total Mileage	Character of Day	Miscellaneous Phenomena
1	29.77	76°	87°	70°	.6920	.77	.40		.34	W	156	Cloudy	☈
2	29.90	79	86	69	.4650	.49	.00		.72	N	109	Clear	
3	29.86	77	86	68	.6620	.73	.45		.60	SE	202	P.Cl.	☈
4	29.89	77	84	68	.6230	.71	.07		.42	W	85	P.Cl.	◎ ▷²
5	29.87	79	84	68	.6460	.67	.00		.93	SE	110	Clear	◎
6	29.85	82	90	71	.7080	.67	.00		.98	SE	125	Clear	≡²
7	29.84	80	88	66	.7120	.69	.48		.54	SE	235	P.Cl.	☈
8	29.86	84	92	69	.8020	.70	1.26		1.00	N	130	Clear	☈ ≡°
9	29.92	84	96	74	.7550	.67	.00		.81	SE	134	Clear	
10	29.96	85	94	73	.7960	.67	.00		.70	SE	207	Clear	
11	29.95	88	95	77	.8300	.64	.00		.63	SE	134	P.Cl.	
12	29.99	87	93	77	.7340	.59	.00		.80	SE	168	Clear	↳
13	30.00	80	89	74	.7080	.70	T		.68	SE	246	P.Cl.	
14	29.92	79	84	74	.7320	.73	.00		.16	SE	180	Cloudy	
15	29.88	84	91	73	.7240	.63	.00		.60	E	75	P.Cl.	
16	29.87	86	95	74	.6690	.55	.00		.66	SE	97	Clear	
17	29.86	83	93	75	.7000	.64	.00		.52	W	137	P.Cl.	Dry ☈
18	29.95	82	91	70	.6320	.59	.00		1.00	N	120	Clear	
19	30.00	71	85	65	.4680	.62	.06		.17	SE	157	Cloudy	☈
20	29.93	76	85	65	.4170	.45	.00		1.00	E	120	Clear	
21	29.89	73	82	66	.4810	.60	.02		.23	S	182	Cloudy	
22	29.94	74	79	69	.6310	.73	.00		.22	S	137	Cloudy	
23	30.08	65	76	60	.4830	.82	.05		.00	N	191	Cloudy	
24	29.99	62	67	57	.4940	.89	1.33		.05	N	144	Cloudy	≡°
25	29.94	69	76	59	.5110	.74	.00		.45	N	97	P.Cl.	▷² ≡°
26	29.94	70	76	62	.5430	.75	.00		.27	SE	128	Cloudy	▷²
27	29.89	75	84	67	.6920	.80	.00		.30	SE	130	Cloudy	≡²
28	29.99	69	77	63	.4020	.57	.60		.77	N	244	Clear	
29	30.11	65	73	54	.3430	.57	.00		1.00	N	184	Clear	
30	30.02	66	77	52	.3400	.57	.00		1.00	N	112	Clear	▷²
31	29.98	72	85	56	.4180	.57	.00		1.00	W	80	Clear	▷²
	29.93	76⁷	85	67	.6062	.66	4.72	00	.60	SE	4556		

SEPTEMBER 1911

Date	Mean Atmospheric Pressure	Mean Temperature F°	Maximum Temperature F°	Minimum Temperature F°	Mean Vapor Pressure in Inches	Mean Relative Humidity	Rain in Inches	Melted Snow in Inches	Sunshine	Prevailing Direction	Total Mileage	Character of Day	Miscellaneous Phenomena
1	29.99	79°	90°	64°	.5360	.56	.00		1.00	S	131	Clear	
2	29.93	81	92	66	.6330	.62	.00		1.00	W	133	Clear	▷¹
3	29.97	79	90	69	.6240	.62	.00		.95	N	136	Clear	
4	29.94	75	85	63	.6640	.74	T		.08	SE	149	Cloudy	☈ 4PM
5	29.81	76	82	67	.6760	.76	2.64		.54	W	139	P.Cl.	
6	29.83	80	90	68	.7170	.74	.00		.70	SE	140	Clear	≡¹ ▷²
7	29.94	74	83	66	.6470	.78	.45		.46	N	200	P.Cl.	☈ 12:40AM
8	30.06	74	84	68	.6690	.81	.14		.10	N	99	Cloudy	◎
9	30.09	76	83	66	.6610	.75	.00		.60	E	93	P.Cl.	≡² ▷²
10	29.95	75	80	72	.7380	.85	.38		.05	W	158	Cloudy	≡¹ ◎
11	29.85	78	86	67	.6550	.73	T		.63	W	101	P.Cl.	
12	29.86	81	90	73	.8060	.76	.00		.80	N	117	Clear	
13	29.95	76	85	60	.6690	.75	.05		.50	E	231	P.Cl.	☈ 9:30PM
14	29.86	85	95	71	.7660	.66	.00		.95	S	232	Clear	↳ ▷²
15	29.86	82	90	77	.7660	.72	.00		.60	W	206	P.Cl.	☈ 4:45PM
16	29.92	75	83	68	.7150	.82	.75		.05	W	112	Cloudy	☈ 7:30PM
17	29.84	78	85	70	.7940	.83	1.49		.60	SE	212	P.Cl.	☈ 4:30AM
18	29.88	78	88	72	.7630	.80	.03		.42	N	178	P.Cl.	☈ 12:45PM
19	30.06	66	74	60	.3730	.60	.00		.75	N	219	Clear	
20	29.93	68	74	57	.4420	.66	T		.58	SE	161	P.Cl.	
21	29.99	65	72	60	.4010	.70	.14		.40	NW	218	P.Cl.	
22	30.15	67	74	55	.4370	.70	.00		1.00	E	106	Clear	≡² ▷²
23	30.06	70	80	58	.4660	.67	.00		1.00	SE	133	Clear	≡² ▷²
24	29.98	78	88	66	.6380	.70	.00		.75	S	157	Clear	
25	30.02	72	80	67	.6770	.88	.25		.01	S	170	Cloudy	☈ ≡°
26	30.12	66	73	62	.5720	.89	.98		.03	E	135	Cloudy	☈ ≡²
27	29.95	80	90	66	.7330	.73	T		1.00	S	152	Clear	≡² ▷²
28	29.88	80	90	71	.7530	.74	T		.51	SE	165	P.Cl.	☈
29	29.97	71	82	66	.4810	.64	T		.11	N	218	Cloudy	☈
30	29.99	66	74	58	.4520	.71	.00		.43	SE	174	P.Cl.	
	29.98	74⁷	83⁷	66	.6315	.73	7.30	00	.56	SE	4795		

OCTOBER 1911.

Date	Mean Atmospheric Pressure	Mean Temperature F°	Maximum Temperature F°	Minimum Temperature F°	Mean Vapor Pressure in Inches	Mean Relative Humidity	Rain in Inches	Melted Snow in Inches	Sunshine	Prevailing Direction	Total Mileage	Character of Day	Miscellaneous Phenomena
1	29.72	72°	75°	67°	.3950	.89	1.15		.01	S	186	Cloudy	☂
2	29.76	65	74	62	.3490	.89	.06		.00	E	154	Cloudy	≡°
3	29.77	78	89	63	.6330	.72	T		.70	S	253	P.Cl.	≡² ☾
4	30.04	66	80	63	.3960	.63	.12		.65	W	220	P.Cl.	☂
5	30.10	62	69	54	.3700	.66	T		.25	SE	247	Cloudy	⊕
6	29.69	75	88	61	.6450	.75	.07		.60	W	309	P.Cl.	☂
7	30.02	52	74	49	.3370	.86	.01		.00	N	290	Cloudy	
8	30.18	52	55	49	.2500	.63	.00		.00	N	169	Cloudy	
9	30.11	57	62	52	.3260	.72	.00		.17	W	80	Cloudy	
10	30.08	61	67	54	.3460	.64	.00		.65	SE	80	Clear	≡°
11	30.03	63	71	50	.4490	.79	.00		.13	SE	82	Cloudy	≡² ⊕
12	30.09	65	72	57	.3520	.58	.00		1.00	E	89	Clear	≡¹
13	30.02	62	68	57	.3830	.69	.00		.26	SE	130	Cloudy	
14	29.86	66	75	57	.4730	.74	T		.80	W	160	Clear	
15	29.80	70	82	57	.5260	.71	.04		.80	SE	225	Clear	
16	29.68	64	75	60	.4210	.70	T		.20	W	242	Cloudy	
17	29.76	60	66	53	.3100	.60	.00		.36	NW	195	P.Cl.	
18	29.87	60	70	47	.3040	.61	.00		1.00	SE	168	Clear	≡²
19	29.97	56	65	51	.3230	.72	.00		.90	N	173	Clear	⊛
20	30.09	49	54	47	.2870	.83	.34		.00	N	126	Cloudy	
21	30.11	43	49	39	.2500	.90	.76		.00	N	222	Cloudy	
22	30.03	47	56	36	.1780	.59	.02		1.00	W	196	Clear	
23	30.16	47	55	40	.1740	.55	.00		1.00	W	207	Clear	⊓°
24	30.32	50	58	40	.2120	.60	.00		.85	SE	197	Clear	⊓°
25	30.23	55	66	43	.2510	.58	.00		.97	SE	141	Clear	
26	30.24	51	61	44	.2880	.78	.00		.50	N	160	Clear	⊕
27	30.36	39	52	36	.1870	.72	.05	T	.00	N	230	Cloudy	*
28	30.27	44	47	39	.1720	.61	.00		.00	N	95	Cloudy	
29	30.17	47	49	43	.2030	.64	.00		.00	W	71	Cloudy	
30	29.98	50	54	46	.2880	.81	.19		.00	SE	172	Cloudy	≡²
31	30.12	47	52	44	.2290	.71	.00		.30	NW	203	Cloudy	
	29.99	57³	65⁵	50³	.3493	.70	2.81	T	.45	N	5472		

NOVEMBER 1911.

Date	Mean Atmospheric Pressure	Mean Temperature F°	Maximum Temperature F°	Minimum Temperature F°	Mean Vapor Pressure in Inches	Mean Relative Humidity	Rain in Inches	Melted Snow in Inches	Sunshine	Prevailing Direction	Total Mileage	Character of Day	Miscellaneous Phenomena
1	30.46	37°	48°	32°	.1233	.54	.00	.00	.70	NW	283	P.Cl.	⊓²
2	30.79	29	36	22	.1014	.64	.00	.00	1.00	N	197	Clear	Killing frost
3	30.52	35	38	29	.1035	.51	.00	.00	.00	SE	174	Cloudy	
4	30.24	42	45	37	.1490	.57	.00	.00	.00	SE	149	Cloudy	
5	30.10	44	47	40	.2430	.90	.40	.00	.00	SE	252	Cloudy	≡² ☾
6	29.65	54	60	44	.2950	.71	.45	.00	.33	W	283	P.Cl.	
7	30.06	48	56	43	.2090	.65	.00	.00	1.00	NW	167	Clear	⊛
8	29.89	49	55	43	.2110	.62	.00	.00	.66	SE	255	Clear	
9	29.74	51	55	43	.3540	.87	T	.00	.15	SE	268	Cloudy	
10	29.91	62	67	54	.4550	.83	.00	.00	.60	SE	315	P.Cl.	⊛ ♄²
11	29.85	61	77	39	.4560	.90	.50	.00	.25	SE	520	Cloudy	Δ° Δ¹ ☂
12	30.35	18	39	13	.0427	.57	.15	.20	.68	W	531	Clear	⊛
13	30.41	24	31	16	.0612	.48	.00	.00	.42	SE	211	P.Cl.	⊓²
14	29.78	40	47	28	.1134	.45	T	.00	.61	SE	237	P.Cl.	⊛ Δ
15	29.94	41	52	35	.1600	.62	.00	.00	.85	N	170	Clear	≡²
16	30.01	41	50	30	.1740	.67	.00	.00	.66	SE	352	P.Cl.	
17	29.61	44	62	34	.2370	.76	.75	.00	.00	W	437	Cloudy	☂
18	29.91	38	41	31	.1570	.68	.00	.00	.25	W	263	Cloudy	⊓²
19	30.09	40	45	35	.1930	.78	.02	T	.08	W	191	Cloudy	
20	30.24	43	47	40	.1560	.61	.00	.00	.08	NW	254	Cloudy	
21	30.24	38	45	31	.1370	.61	.00	.00	.65	N	166	Clear	⊓²
22	30.03	43	52	34	.1640	.60	.10	.00	.33	SE	311	Cloudy	
23	30.10	30	46	25	.1153	.69	.50	.00	.00	NW	303	Cloudy	
24	30.30	26	32	19	.0970	.71	.00	.01	.75	W	251	Clear	
25	30.08	39	47	27	.1137	.49	.00	.00	1.00	W	169	Clear	
26	29.91	52	64	39	.1480	.40	.00	.00	1.00	SW	205	Clear	
27	29.79	44	55	40	.1800	.63	.27	.00	.37	SE	217	Cloudy	
28	29.99	23	42	20	.0971	.80	.28	.12	.00	NW	452	Cloudy	
29	30.31	18	24	13	.0725	.79	.00	.01	.75	W	258	Clear	
30	30.20	34	41	20	.0930	.48	.00	.00	.70	W	226	P.Cl.	
	30.08	39⁶	48²	31°	.1741	.65	3.42	.34	.46	SE	8067		

DECEMBER 1911.

Date	Mean Atmospheric Pressure	Mean Temperature F°	Maximum Temperature F°	Minimum Temperature F°	Mean Vapor Pressure in Inches	Mean Relative Humidity	Rain in Inches	Melted Snow in Inches	Sunshine	Prevailing Direction	Total Mileage	Character of Day	Miscellaneous Phenomena
1	30.08	43°	50°	33°	.1670	.61	.00	.00	.60	W	228	P.Cl.	
2	30.15	41	51	33	.1550	.60	.00	.00	.80	W	152	Clear	
3	30.24	33	47	31	.1118	.59	.00	T	.10	N	362	Cloudy	
4	30.47	33	38	26	.1144	.64	.00	.00	.60	SE	163	Clear	≡¹
5	30.32	38	45	29	.1230	.56	.00	.00	.80	SE	206	Clear	≡¹
6	30.22	44	54	33	.1530	.55	.00	.00	.65	SE	200	P.Cl.	≡¹
7	30.19	50	56	41	.2390	.68	.00	.00	.18	SE	156	Cloudy	≡¹
8	30.17	53	58	45	.3320	.83	.03	.00	.12	S	165	Cloudy	
9	30.02	56	60	53	.4020	.89	.03	.00	.00	SE	231	Cloudy	≡²
10	29.75	58	65	51	.3480	.74	.32	.00	.30	SW	389	Cloudy	
11	30.06	44	51	41	.2140	.75	.03	.00	.06	N	131	Cloudy	
12	30.15	37	44	33	.1700	.79	.00	.00	.35	N	156	P.Cl.	
13	30.22	30	36	27	.1660	1.00	.00	.00	.00	SE	57	Cloudy	≡² ⌐²
14	30.02	34	36	27	.1790	.90	.00	.00	.00	N	122	Cloudy	⌐²
15	29.92	37	40	34	.1600	.73	T	.00	.00	N	124	Cloudy	Δ
16	29.96	32	39	31	.1670	.91	.06	.50	.00	NW	251	Cloudy	Δ
17	30.25	34	37	30	.1640	.83	.00	.00	.01	SE	134	Cloudy	
18	30.42	38	46	30	.1730	.73	.00	.00	.35	SE	137	P.Cl.	≡¹ ⌐²
19	30.34	36	42	30	.1590	.77	.00	.00	.30	E	160	P.Cl.	
20	29.85	38	40	34	.2000	.87	.26	.00	.00	SE	372	Cloudy	≡¹
21	29.95	45	49	37	.1930	.66	.00	.00	.60	S	200	P.Cl.	
22	29.90	40	46	38	.1750	.70	.00	.00	.12	W	156	Cloudy	
23	29.90	33	39	29	.1350	.73	.00	.00	.10	W	170	Cloudy	⌐²
24	29.89	40	48	32	.1430	.58	.00	.00	1.00	SE	228	Clear	
25	30.10	36	42	34	.1850	.88	T	.00	.00	N	136	Cloudy	
26	29.61	40	47	35	.2200	.86	.27	.00	.00	SE	302	Cloudy	≡²
27	30.22	24	36	21	.0830	.86	.00	T	.37	W	464	P.Cl.	
28	30.47	24	31	15	.0725	.58	.00	.00	1.00	SE	236	Clear	
29	30.22	35	39	28	.1489	.71	.01	.00	.00	SE	234	Cloudy	
30	29.92	38	41	35	.2210	.96	.26	.00	.00	SE	135	Cloudy	
31	30.09	18	40	11	.0588	.82	.00	.01	1.00	W	409	Clear	
	30.10	38	45	32°	.1785	.72	1.27	.51	.38	SE	6586		

MONTHLY AND ANNUAL METEOROLOGICAL SUMMARY 1911.

	Atmospheric Pressure			Temperature					Moisture		Precipitation		Wind		Weather				Miscellaneous Phenomena										
	Mean	Highest	Lowest	Maximum	Minimum	Mean Maximum	Mean Minimum	Monthly Mean	Mean Vapor Pressure	Relative Humidity	Rain	Melted Snow	Prevailing Direction	Total Mileage	Average Daily Sunshine	Number of Clear Days	Number of Cloudy Days	Partly Cloudy Days	Solar Halos	Lunar Halos	Thunderstorms	Hail	Sleet	Fog	Frost	Killing Frost	Date of Killing Frost	
JANUARY	30.14	30.59	29.66	73	-2	45.5	27.6	36.3	.1672	.68	1.05	.17	S	7045	.45	6	19	6	0	1	1	4	2	1	None in Spring			
FEBRUARY	30.13	30.66	29.49	83	15	47.6	31.3	39.0	.1725	.67	1.93	1.93	W	6859	.56	12	13	3	2	3	1	0	2	1	1			
MARCH	30.01	30.47	29.45	80	21	58.5	36.2	46.6	.1842	.57	2.01	.42	SE	7937	.68	16	6	9	0	1	2	1	1	1	2			
APRIL	30.00	30.47	29.34	75	33	63.3	45.6	55.0	.2663	.61	6.92	0.00	SE	7035	.53	11	14	5	3	2	6	3	0	3	0			
MAY	29.97	30.35	29.51	94	37	76.8	61.0	72.8	.4373	.53	1.85	T	S	5740	.81	17	2	12	1	1	4	1	0	5	0			
JUNE	29.88	30.07	29.61	99	62	90.0	70.0	81.0	.5919	.57	1.79	0.00	S	5273	.75	15	7	8	0	0	7	0	0	0	0			
JULY	29.94	30.16	29.60	101	56	89.0	70.0	80.9	.5667	.55	0.74	0.00	S	5356	.74	13	6	12	0	0	2	0	0	1	0			
AUGUST	29.93	30.14	29.76	96	52	85.0	67.0	76.7	.6062	.66	4.72	0.00	SE	4556	.60	14	9	8	0	0	6	0	0	3	0			
SEPTEMBER	29.98	30.19	29.78	95	55	83.7	66.0	74.7	.6315	.73	7.30	0.00	SE	4795	.56	11	7	12	0	1	12	0	0	5	0			
OCTOBER	29.99	30.40	29.64	89	36	65.5	50.3	57.3	.3493	.70	2.81	T	N	5472	.45	10	16	5	1	0	3	0	0	6	2			
NOVEMBER	30.08	30.82	29.26	77	13	48.2	31.9	39.6	.1741	.65	3.42	0.34	SE	8067	.46	10	13	7	1	3	2	1	2	2	5	NOV 2		
DECEMBER	30.10	30.54	29.52	65	11	45.0	32.5	38.0	.1785	.72	1.27	0.51	SE	6586	.38	6	18	7	0	1	0	0	2	9	3			
ANNUAL	30.01	30.82	29.26	101	-2	66.0	48.0	58.0	.3605	.64	35.84	3.10	SE	74621	.58	141	130	94	8	13	46	7	11	38	14			